

Enforcement Alert

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Violations at Metal Recycling Facilities Cause Excess Emissions in Nearby Communities

Purpose

The U.S. Environmental Protection Agency (EPA) is publishing this enforcement alert (Alert) because EPA and state investigations have identified Clean Air Act violations at metal recycling facilities that operate auto and scrap metal shredders, causing excess emissions of air pollution. Over 250 metal recycling facilities are currently operating with a shredder in the United States. These facilities are often located in densely populated areas - noncompliant shredders can have an impact on overburdened communities. This Alert is intended to inform metal recycling facility owners and operators about the Clean Air Act requirements that might apply at their facilities and the air pollution control systems that are in use for shredders at similar facilities. Specifically, shredder operators should be aware of the amount of volatile organic compounds (VOCs) and other emissions from their facilities and should contact their local regulatory or permitting authority for further guidance. Enforcement actions have assessed substantial penalties and have required the installation of emission control equipment.

Schnitzer Steel (California) owns and operates a facility in Oakland, CA. On February 3, 2021, the California AG announced a settlement with Schnitzer. The settlement requires Schnitzer to pay \$4.1 million in penalties, implement supplemental environmental projects, and make significant changes to its operations and practices. Schnitzer will install two regenerative thermal oxidizers, a temporary CEMs, and an acid control system by December 2022.

Non-Compliance Concerns

EPA and state agencies have found violations related to excess VOC emissions at several facilities. Over the past 15 years, more than 25 emissions tests measuring VOCs have been conducted at scrap metal shredders. The quality of the emissions data for these tests varies. Despite this, the historic test data shows that VOC emissions from shredding operations are at levels that can trigger regulatory applicability and the need for emission controls. The test data reveals that typical shredding operations emit VOCs at rates between 20 and 200 lbs of VOCs per hour. Test results are greatly determined by the capture efficiency of the test equipment. Recent emission tests with a focus on maximizing capture efficiency have shown that emission rates from shredders are likely higher than these rates.¹

VOC emissions from scrap metal shredding facilities are regulated by the Clean Air Act because VOC emissions can contribute to the formation of ground level ozone and contribute to violations of the National Ambient Air Quality Standards (NAAQS) for ozone. Rates of uncontrolled VOC emissions correlate to the size of the shredder and the type of material shredded. Emission rates are generally reduced if the shredder has an enclosure and existing controls such as a cyclone or scrubber. Emission rates are also generally reduced where the facility removes contaminants before shredding (known as “depolluting”).

Permit thresholds for VOC emissions vary depending on whether the shredder is in an area that meets the NAAQS for ozone or is in an ozone transport region. Major sources are subject to permitting requirements and facilities with VOC

¹ Testing at Schnitzer Steel in Oakland California in four separate tests in 2018 and 2019 identified VOC emissions rates of 86, 183, 151, and 284 lb/hr.

emissions above certain thresholds are required to undergo a New Source Review (NSR) or Prevention of Significant Deterioration (PSD) review for new and modified sources. Depending on the location, existing facilities may be subject to Reasonably Available Control Technology (RACT) regulations at different emission thresholds. In addition, some states require facilities to obtain a permit or install controls at VOC emission thresholds lower than those for NSR, PSD, or RACT. Failure to comply with any of these requirements is a violation of the Clean Air Act which could lead to enforcement actions. In such actions, facilities may be required to install add-on controls, pay civil penalties, and take other measures.

Metal recycling facilities with shredders collect automobiles, large appliances, and other items containing recyclable metal. These items come from municipalities, manufacturers, small businesses, and the public. Facilities process the scrap materials by sorting and stockpiling incoming recyclable materials. Shred-able materials are processed by loading and conveying materials into a hammermill shredder that breaks apart materials into a size suitable for further processing. The shredded material is then conveyed through various separating mechanisms—generally magnetic and eddy current—to separate out ferrous metal, non-ferrous metal, and non-metal materials. Recovered scrap metals are sold to end users, such as manufacturers, mills, foundries, secondary smelters, and metal brokers.

Sims Metal Management New England Corporation (SMM) owns and operates a scrap metal shredding operation that uses a 7,000 hp shredder in Johnston, RI. EPA and Rhode Island found that SMM constructed a new major source of VOC emissions without obtaining a permit and without installing required emission controls. In September 2020, SMM entered into a settlement that requires the company to pay \$250,000 in federal penalties and \$2 million in state penalties. In addition, SMM will install a control train consisting of an enclosure, fans, pollution controls to reduce particulate matter, a regenerative thermal oxidizer to reduce VOCs, and an acid gas scrubber.

Significant amounts of non-metal materials are contained in the shredded materials, which can vaporize and become organic air emissions. These materials include plastics, paints, caulks, sealants, rubber, switches, fluids, and fluid residues. The process of grinding and shredding scrap metal generates heat, resulting in residual fluids and fuels becoming gases. The violent nature of the process creates the potential for particulate matter emissions of various sizes. Thus, the process generates emissions of VOCs, particulate matter, and hazardous air pollutants including lead, zinc, cadmium, mercury, and organic pollutants.

Air Pollution Control Strategies

Air pollution controls have been installed on several metal shredding operations across the country. Generally, an effective emission control train is necessary to comply with applicable Clean Air Act regulations. Emissions must first be captured before they can be controlled. Several facilities have constructed permanent total enclosures around the shredder and used large fans to create a negative pressure environment. Given the need for several large openings (*e.g.*, to allow scrap metal to be fed into the conveyor and shredded material to flow out), pick-up fans and overhead hoods are often required to maintain negative pressure within the enclosure and to ensure that emissions do not escape from the openings.

With an effective enclosure and duct work in place, emissions can then be routed to a control system. Because metal particles are present in the exhaust, the first phase in the control train captures large and smaller particles (*e.g.*, using a cyclone, venturi scrubber, or fabric filters). Downstream of the particulate control device, regenerative thermal oxidizers for VOC control are typically used. The final component of the control train is usually a scrubber designed to control the acid gases (*e.g.*, hydrogen fluoride and hydrogen chloride) that can be present in the exhaust.

Depolluting to Prevent Pollution

Best industry practices include removal and recovery or proper disposal of fluids and certain materials prior to shredding (depolluting). Many of these pollution prevention practices also help prevent fires and explosions in the shredder. These include removal of: gasoline and diesel fuel, oil, antifreeze, brake fluid, transmission fluid, etc.; lead-acid batteries; vehicle air bags; capacitors and transformers; switches and light ballasts containing mercury; tires; compressed gas cylinders; and refrigerants in appliances such as air conditioners, dehumidifiers, and refrigerators, as required by the Clean Air Act.

Recommended Actions

To help minimize VOC emissions and achieve compliance, EPA recommends that owners and operators of scrap metal shredders take steps to:

- Follow best pollution prevention practices by depolluting scrap materials before they enter the shredder.
- Estimate hourly and annual VOC emissions, using appropriate available test data from similar facilities. If estimated total annual or hourly VOC emissions are below, but near the RACT or NSR/PSD thresholds for your area, consult with EPA or the state environmental agency and consider conducting a performance test to measure actual VOC emissions and to develop a facility-specific emission factor.
- If estimated emissions are over the RACT or NSR/PSD thresholds, contact EPA or the state environmental agency to discuss a path forward. In some cases, the installation of capture and add-on pollution controls may be required.

Prolerized New England Company (dba Schnitzer Northeast) own and operate a scrap metal shredding operation that uses a 9,000 hp shredder in Everett, MA. Massachusetts found that Schnitzer Northeast was a major source of VOC emissions needing to install best available control technology. Schnitzer Northeast entered into a settlement with Massachusetts and paid a penalty of \$900,000. Schnitzer Northeast installed a control train consisting of an enclosure, fans, drop out boxes to reduce large particles, venturi scrubbers to reduce small particles, regenerative thermal oxidizers to reduce VOCs, and acid gas scrubbers.

DISCLAIMER: This document aims to explain the application of certain EPA regulatory provisions using plain language. Nothing in this Alert revises or replaces any regulatory provisions, any other part of the Code of Federal Regulations, the Federal Register, or the Clean Air Act. Following the recommendations discussed in this Alert does not guarantee compliance with the Clean Air Act, its implementing regulations, and associated state/local requirements. For more information, visit: www.epa.gov/compliance.