

# ADVANCED RECYCLING FACILITIES ARE TIGHTLY REGULATED AT THE FEDERAL, STATE AND LOCAL LEVEL

This document provides a general overview for how advanced recycling (AR) facilities are typically regulated under federal, state, and local requirements. Most of the requirements are based on the products manufactured. For a general overview of advanced recycling, please visit [Advanced Recycling: Remaking Plastics to Meet Sustainability Goals](#). As the U.S. advanced recycling sector continues to mature, most commercially operating AR facilities process a minimum of 50 tons of plastics per day.

## EXECUTIVE SUMMARY & PRELIMINARY BACKGROUND

AR facilities are **commonly regulated as manufacturing operations** and are subject to numerous sections of the **Clean Air Act** (CAA), including emissions limitations, monitoring, reporting, and recordkeeping requirements under nationally applicable mandates (CAA Sections 111 and 112) and preconstruction and operating permitting requirements under applicable federal, state, and local regulatory authorities.

The AR process starts with specific, **pre-sorted and cleaned, used plastic feedstocks**, which are distinct from unrecovered solid waste and garbage.

AR operations do not incinerate solid waste and their **emissions are tightly monitored and regulated** by authorities for health and safety.

AR facilities are subject to state and federal industrial stormwater requirements (per the **Clean Water Act**) and, as applicable, must remain compliant with any industrial wastewater discharge permit requirements.

AR facilities may need to comply with a range of additional regulations depending on the outputs and coproducts produced as well as byproducts and waste outputs or unusable feedstocks. **Non-plastic materials are disposed of in accordance with state and local solid waste laws.**

# PERMITTING FOR ADVANCED RECYCLING FACILITIES

Even with low emissions, AR facilities may be subject to federal, state, and local air and water regulations — including permits — depending on their scale.

## AIR PERMITS

Advanced recycling facilities are commonly regulated as manufacturing facilities. Their operations can be subject to the following federal, state, and local air permits – depending on the scale and processing capacity of the operations. Small- to medium-sized AR operations tend to be minor source facilities, and the requirements for both major and minor sources are described below:

### FEDERAL

The Clean Air Act sets forth several air pollution control requirements that are typically implemented through state permits. The federal requirements may apply differently depending on whether the facility is a major or minor source of emissions.

#### Emissions Limits and Other Substantive Requirements

##### Applies to both major and minor sources:

- National Emission Standards for Hazardous Air Pollutants Compliance (NESHAP) sets standards for hazardous air pollutants from certain major or minor (called “area”) sources.
- New Source Performance Standards (NSPS) establishes emissions standards for new or newly modified facilities within certain source categories, such as synthetic organic chemical manufacturing facilities. NSPS often regulates facilities by size, and the requirements for regulated facilities vary.

#### Permitting

##### Major Sources:

- Pre-construction Permits
  - Prevention of Significant Deterioration (PSD) and New Source Review (NSR) pre-construction permits apply to new major sources and major modifications to those sources. Permitting under this program is triggered if a facility’s potential air emissions exceed certain thresholds. Applicable triggering thresholds for a major source for criteria air pollutants (i.e., particulate matter, VOCs, SO<sub>x</sub>, NO<sub>x</sub>, CO, and lead) are either 100; if the source is on a specific list, or 250 tons per year. Major modification thresholds also vary from 15 to 100 tons per year, depending on where the source is located and the pollutant.

- Operating Permits
  - The majority of advanced recycling facilities fall well below EPA emissions thresholds requiring additional air permits, however, as companies scale up the size or output of their facilities, they may be subject to Title V operating permits.
  - Title V operating permits are required for sources of hazardous air pollutants (HAPs) (i.e., benzene, perchloroethylene, and methylene chloride) exceeding 10 tons per year for a single HAP or 25 tons per year for any combination of HAPs. Title V requirements are generally required for sources of criteria pollutants at 100 tons per year, or HAPs exceeding 10 tons per year for a single HAP or 25 tons per year for any combination of HAPs.
  - Holders of Title V permits must operate in compliance with the permit limitations and certify their compliance with these more stringent permit requirements on an annual basis.
  - Title V permit holders are subject to a suite of regulations in addition to their Title V responsibilities. Additionally, facilities that co-process materials in addition to their advanced recycling operations are already subject to strict regulations. When compared to new facilities, co-processing facilities introduce a minimal amount of new emissions by leveraging existing infrastructure and replacing fossil-based feedstock in the post-use plastics supply chain.

#### Minor Sources:

- Minor sources are subject to state Minor New Source Review (Minor NSR) pre-construction permitting and operating permit programs.
- Facilities that are minor sources may adopt an enforceable limitation on their potential to emit to maintain their minor source status. These sources are known as “synthetic minor” sources.

## STATE

States generally implement the Clean Air Act permitting requirements and will have additional pre-construction and operating permit regulations. Even if the facility is a minor source and is not subject to PSD/NSR or Title V permitting requirements, it will very likely need a state air, construction and/or operating permit, and may also have substantive emission limitation, monitoring, recordkeeping, and reporting requirements.

## REGIONAL

Federal air quality enforcement authority is traditionally delegated to the state for enforcement. In turn, some states delegate the authority for enforcement to local air quality authorities. For example, in California, they are called Air Quality Management Districts (AQMD) and they enforce the federal, state, and/or other more stringent standards, depending on air quality concerns.

# WATER PERMITS

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## Process Water Permit

Depending on the technology, water used in the manufacturing process is likely to be treated, recirculated, and periodically purged.

### FEDERAL

Under the Clean Water Act (CWA), a facility's discharge of process water to waters of the United States requires authorization. A facility may choose to discharge process water directly, pursuant to a National Pollutant Discharge Eliminations System (NPDES) permit obtained by the facility, or indirectly via discharge to a Publicly Owned Treatment Works (POTW). Prior to discharge, the facility may be required to treat water on-site to meet certain criteria including categorical pre-treatment standards. See [40 CFR Part 403](#), *et seq.* EPA implements the NPDES program in some states.

### STATE

Most states implement NPDES permit programs and will issue NPDES permits. A facility's NPDES permit will include discharge limits, sampling, and reporting requirements. If a facility discharges indirectly to a POTW, the POTW will hold an NPDES permit and may, in turn, impose requirements on the facility to obtain a discharge authorization and/or ensure that its discharges do not prevent the POTW from meeting the POTW's NPDES permit requirements.

### LOCAL

A discharge permit from the local wastewater authority may be required if process water meets local specifications.

## Storm Water Permit

The CWA also regulates discharges of surface water drainage (storm water) through its NPDES and General Permit programs. Advanced recycling equipment is often indoors, so the requirements regarding storm water could be limited to construction, parking, and loading and unloading areas for inbound feedstocks and outbound products. If a facility is located indoors and required physical controls are in place — such as cover and controlled drainage basins — then a facility may receive a “No Exposure Certification,” which demonstrates a storm water permit is unnecessary.

# REGULATIONS FOR ADVANCED RECYCLING OUTPUTS & COPRODUCTS

## OIL OUTPUTS AND PLASTIC PRODUCTS

Operators may need to comply with a range of regulations, depending on the product produced. For example, when the product is to be sold as a raw material or intermediate for new chemicals or plastics production, the following requirements may be required:

### FEDERAL

U.S. Environmental Protection Agency (EPA) Toxic Substances Control Act (TSCA) Pre-Manufacturing Notice ([40 CFR 720](#))

Spill Prevention Control and Countermeasure (SPCC) Plan ([40 CFR 112](#))

### STATE & LOCAL

State fire code will also require permits for controls due to the storage of oil and/or flammable materials.

## BY-PRODUCT OUTPUTS

### Char/Carbon Black

A byproduct of an AR process can be in the form of a solid residue, also known as char. If the char meets downstream offtake requirements, then this becomes a product that can be used as carbon black for tire manufacturing, ink production, or an asphalt modifier. Waste generators are required to test the waste to determine whether it should be managed as a solid or a hazardous waste. Most char from small- to medium-sized AR operations is non-hazardous and will be managed as solid waste. If the char is contaminated, then the following hazardous waste management requirements will apply:

### FEDERAL

Under the Resource Conservation and Recovery Act (RCRA) ([40 CFR 260299](#)), AR manufacturing operations, just like other common manufacturing and industrial processes, may be subject to RCRA regulations if these operations are generating hazardous waste and would be required to manage the waste accordingly.

### STATE

Often the enforcement of the federal regulations is delegated to the state's environmental agencies. States may also impose additional waste management requirements through their solid and hazardous waste regulations.

### LOCAL

Counties and cities often have additional requirements for the management of non-hazardous waste. In some counties and cities, there may be unique local legislation such as toxic right to know laws that may require further disclosure/reporting if the waste is hazardous. Therefore, the local agencies may set stricter standards than the federal or state governments.

## Salts

Plastic resins containing chlorine or fluorine can contaminate the saleable products from certain AR processes and tend to be removed or excluded from the raw material streams to the extent possible. However, some chlorinated plastics may find their way into the process. Because chlorine can cause corrosion of the equipment, it is often converted to salts. The salt can be disposed of as non-hazardous waste.

## OFF-SPECIFICATION FEEDSTOCKS

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AR facilities typically rely on specific, pre-processed plastic products as feedstock for their recycling activities. These facilities tend to convert intentionally separated, non-bottle plastics such as films, flexibles, and other less commonly recycled plastic products into material used to manufacture marketable products. Even with the pre-processing however, materials such as paper, metal, and other small-unidentified material can occasionally make it through the screening process. The handling and disposal of these non-plastic materials would be governed by applicable solid waste laws.

Because this only provides a high-level summary, there may be conditions applicable to specific AR operations involving additional or different requirements. No warranty is provided with respect to the accuracy or completeness of this information and the authors assume no liability for any use, errors, omissions, or ambiguities.