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Effluent Limitation Guidelines (ELGs) for Steam Electric Power Plants

Overview

The Clean Water Act (CWA) prohibits the discharge of pollutants from any point source into "waters of the United States" without a permit. Thus, industrial and other facilities that discharge to waters of the United States must obtain permits from the U.S. Environmental Protection Agency (EPA) or delegated states that set limits on pollutants in facilities' effluents. To inform the limits set in permits for industrial dischargers, EPA publishes Effluent Limitation Guidelines (ELGs)—nationally applicable regulations that establish technology-based standards for categories of industrial dischargers. Since 1972, EPA has promulgated ELGs for 59 industrial categories, including the steam electric power industry—which covers power plants that use nuclear or fossil fuels (e.g., coal, oil, and natural gas) to generate steam used to produce electricity.

In 2015, EPA published revised ELGs for the steam electric power industry (2015 Rule) to replace rules issued in 1982. EPA determined that new ELGs were necessary to reflect changes in the industry. For example, improvements in air pollution control technologies since 1982, particularly at coal-fired power plants, reduced air pollutant emissions but transferred some of these pollutants to liquid wastestreams, increasing pollutant discharges to surface waters. EPA promulgated the 2015 Rule to address those water quality impacts by establishing new or additional requirements for several wastestreams from steam electric power plants.

Since that time, EPA has published additional regulations to update the 2015 Rule to reflect developing treatment technologies and new performance data, and to address legal challenges. EPA published its most recent ELG update for the steam electric power category in May 2024 (2024 Rule). The Biden Administration announced the rule as one of a suite of final rules to reduce pollution from fossil-fuel-fired power plants. On March 12, 2025, the second Trump Administration announced its plans to reconsider the 2024 Rule.

Background and the 2015 Rule

ELGs set technology-based standards, including numeric limits, for specific wastewater pollutants. For point sources that introduce pollutants directly into U.S. waters—*direct dischargers*—EPA or delegated states incorporate the limits set in ELGs into National Pollutant Discharge Elimination System (NPDES) permits. For sources that discharge to publicly owned treatment works (POTWs)—*indirect dischargers*—EPA promulgates pretreatment standards that are enforced by POTWs and federal and state authorities.

The CWA requires industrial dischargers to achieve specified levels of pollution control based on whether a discharger is direct or indirect, whether a source is new or existing, and the category of pollutant discharged. ELGs are based on the performance of specific control technologies, but the regulations do not require a facility to use a specific technology.

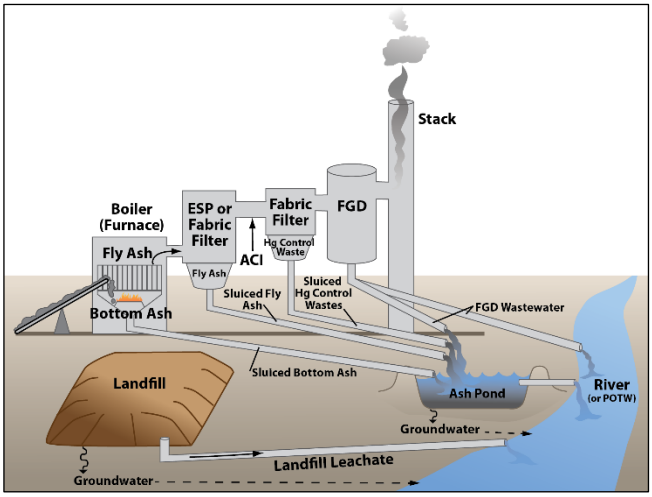
CWA Section 304(m) directs EPA to annually review existing ELGs to determine whether revisions are needed. During its 2005 review, EPA identified the steam electric power industry ELGs for possible revision based in part on data showing that the industry ranked high in discharges of toxic and nonconventional pollutants. EPA initiated a study, completed in 2009, which found that the 1982 regulations did not adequately address the pollutants being discharged and had not kept pace with changes in the industry. The study focused primarily on coal ash handling operations and flue gas desulfurization (FGD) systems (i.e., scrubbers) used at coal-fired power plants to control air pollution. While scrubbers reduce pollutant emissions into the air, some create a significant liquid wastestream. The study further noted that pollutants in wastewater at some coal combustion plants have the potential to degrade water quality when discharged to surface waters or leached into groundwater.

In 2009, environmental groups sued EPA to compel the agency to commit to a schedule for issuing revised ELGs for this industry. Pursuant to a consent decree, EPA promulgated a final rule in 2015. The 2015 rule included the first federal limits on toxic metals and other pollutants in wastewater discharges from steam electric power plants. The rule included new or additional requirements for both existing sources and new sources in several wastestreams. These wastestreams (some of which are shown in **Figure 1**) included the following:

- *Flue gas desulfurization (FGD) wastewater*: wastewater generated from the wet FGD scrubber system (used to prevent air emissions of sulfur dioxide) that contacts the flue gas or the FGD solids
- *Fly ash transport water*: wastewater that is used to convey fly ash from an ash collection or storage equipment, or boiler, and has direct contact with the ash
- *Bottom ash transport water (BATW)*: wastewater that is used to convey bottom ash from an ash collection or storage equipment, or boiler, and has direct contact with the ash
- *Flue gas mercury control (FGMC) wastewater*: wastewater generated from an air pollution control system installed or operated for the purpose of removing mercury from flue gas

- *Gasification wastewater*: wastewater generated at an integrated combined cycle plant from the gasifier or the synthetic gas cleaning, combustion, and cooling processes
- *Combustion residual leachate (CRL)*: leachate from a landfill or surface impoundment that contains combustion residuals

Figure 1. Selected Wastestreams from Steam Electric Power Plants



Source: EPA, "Steam Electric Power Generating Effluent Guidelines," https://www.epa.gov/eg/steam-electric-power-generating-effluent-guidelines.
Notes: ACI is activated carbon injection, ESP is electrostatic precipitator, FGD is flue gas desulfurization, POTW is publicly owned treatment works, and Hg is mercury.

Specifically, the 2015 Rule established effluent limits for arsenic, mercury, selenium, and nitrogen for FGD wastewater at existing sources, as well as more stringent limits for these pollutants and a limit on total dissolved solids for new sources. The 2015 Rule also set limits on arsenic, mercury, selenium, and total dissolved solids in gasification wastewater at existing and new facilities, with more stringent limits at newer facilities. The rule also required zero discharge of pollutants in fly ash transport water, BATW, and FGMC wastewater for existing and new sources. For CRL, the rule established limits for total suspended solids (TSS) for existing facilities and for arsenic and mercury at new facilities.

The 2015 Rule maintained requirements from the 1982 regulations (which were focused on settling out particulates rather than treating dissolved pollutants) for TSS and oil and grease. Additionally, EPA established limitations for *legacy wastewater* equal to the 1982 limitations on TSS for several wastestreams. EPA defined *legacy wastewater* to mean FGD wastewater, fly ash transport water, bottom ash transport water, FGMC wastewater, or gasification wastewater generated prior to a date specified by the permitting authority (to be set between November 2018 and December 2023).

Revisions to the 2015 Rule

The 2015 Rule faced legal challenges and EPA received two petitions for administrative reconsideration, which raised "wide-ranging and sweeping objections to the rule" and included new data for EPA to consider. In response, EPA agreed to reconsider the ELGs for two waste streams—FGD wastewater and BATW—for existing sources. EPA finalized a 2017 rule postponing compliance deadlines for those wastestreams to allow the agency time to revise the limits.

In 2020, EPA published a final rule revising the limits for existing facilities for those two wastestreams (the 2020 Rule). EPA concluded that more affordable technologies capable of removing similar pollutant amounts had become available since 2015, and changed the technology basis for treatment of the two wastestreams. The 2020 Rule established new subcategories and varying requirements for high flow facilities, low utilization units, and units retiring by 2028. Some of these changes reflected less stringent standards for the new subcategories.

2024 Rule

In May 2024, EPA published a final rule to "strengthen" the wastewater discharge standards that apply to coal-fired and other steam-electric power plants. EPA explained that better performing treatment technologies continued to develop following the issuance of the 2020 Rule, and there was more information about their performance. The 2024 Rule established more stringent standards for three wastestreams generated at existing facilities: FGD wastewater, BATW, and CRL. These standards include a zero-limitation for pollutants in FGD wastewater, BATW, and CRL. The 2024 Rule also established numeric discharge limitations for mercury and arsenic for *unmanaged CRL* (i.e., certain discharges through groundwater) and for discharges of *legacy wastewater* from certain surface impoundments.

The 2024 Rule also eliminated less stringent requirements for two subcategories of facilities (high flow facilities and low utilization energy generating units) that were contained in the 2020 Rule. The 2024 Rule also included certain implementation flexibilities. For example, facilities that permanently cease coal combustion by 2034 (whether through closing or switching to fuels that generate fewer pollutants) may continue to fall under the requirements in the 2015 and 2020 rules, rather than the more stringent 2024 Rule requirements.

Reconsideration of the 2024 Rule

On March 12, 2025, EPA announced its plans to reconsider the 2024 Rule, as part of the second Trump Administration's announcement of deregulatory actions to "power the great American comeback."

Stakeholder and Congressional Interest

Some stakeholder groups and Members of Congress supported the 2024 Rule, pointing to EPA's analysis that it will reduce hundreds of millions of pounds of pollutants from entering waterways each year. Others opposed the rule, arguing that the new regulations are unachievable for many facilities and will force their premature retirement. The March 2025 announcement to reconsider the 2024 Rule similarly prompted both congressional and stakeholder support and opposition.

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