# In the United States Court of Appeals
## FOR THE EIGHTH CIRCUIT

No. 24-2123(L)
Southwestern Electric Power Company; Utility Water Act Group,
*Petitioners,*

v.

United States Environmental Protection Agency; Michael S. Regan, Administrator, United States Environmental Protection Agency,
*Respondents,*

Clean Water Action, Sierra Club, Waterkeeper Alliance, Inc., Natural Resources Defense Council, Environmental Integrity Project, PennEnvironment, Inc. and Prairie Rivers Network,
*Intervenor-Respondents*.

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On Petitions for Review from the
U.S. Environmental Protection Agency

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**ADDENDUM TO THE OPENING BRIEF OF UTILITY AND STATE PETITIONERS**

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November 7, 2024

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*Petitioners*,

v.

United States Environmental Protection Agency; Michael S. Regan, Administrator, United States Environmental Protection Agency,

*Respondents*,

Clean Water Action, Sierra Club, Waterkeeper Alliance, Inc., Natural Resources Defense Council, Environmental Integrity Project, PennEnvironment, Inc. and Prairie Rivers Network,

*Intervenor-Respondents*.

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City Utilities of Springfield, Missouri, by and through the Board of Public Utilities,

*Petitioner*,

v.

United States Environmental Protection Agency; Michael S. Regan, Administrator, United States Environmental Protection Agency,

*Respondents*,

Clean Water Action, Sierra Club, Waterkeeper Alliance, Inc., Natural Resources Defense Council, Environmental Integrity Project, PennEnvironment, Inc. and Prairie Rivers Network,

*Intervenor-Respondents*.

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*Petitioners*,
v.
United States Environmental Protection Agency; Michael S. Regan, Administrator, United States Environmental Protection Agency,
*Respondents*,

Clean Water Action, Sierra Club, Waterkeeper Alliance, Inc., Natural Resources Defense Council, Environmental Integrity Project, PennEnvironment, Inc. and Prairie Rivers Network,
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*Petitioner*,
v.
U.S. Environmental Protection Agency; Michael S. Regan, Administrator, United States Environmental Protection Agency,
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**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Part 423**

**[EPA–HQ–OW–2009–0819; FRL–8794–02–OW]**

**RIN 2040–AG23**

## Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** The Environmental Protection Agency (EPA or the Agency) is finalizing a Clean Water Act regulation to revise the technology-based effluent limitations guidelines and standards (ELGs) for the steam electric power generating point source category applicable to flue gas desulfurization (FGD) wastewater, bottom ash (BA) transport water and legacy wastewater at existing sources, and combustion residual leachate (CRL) at new and existing sources. Last updated in 2015 and 2020, this regulation is estimated to cost an additional $536 million to $1.1 billion dollars annually in social costs and reduce pollutant discharges by an additional approximately 660 to 672 million pounds per year.

**DATES:** This final rule is effective on July 8, 2024. In accordance with 40 CFR part 23, this regulation shall be considered issued for purposes of judicial review at 1 p.m. Eastern time on May 23, 2024. Under section 509(b)(1) of the Clean Water Act (CWA), judicial review of this regulation can be had only by filing a petition for review in the U.S. Court of Appeals within 120 days after the regulation is considered issued for purposes of judicial review. Under section 509(b)(2), the requirements of this regulation may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

**ADDRESSES:** The EPA has established a docket for this action under Docket ID No. EPA–HQ–OW–2009–0819. All documents in the docket are listed on the *https://www.regulations.gov* website. Although listed in the index, some information listed in the index is not publicly available, *e.g.,* confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through *https://www.regulations.gov.*

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**SUPPLEMENTARY INFORMATION:**

*Preamble Acronyms and Abbreviations.* The EPA uses multiple acronyms and terms in this preamble. To ease the reading of this preamble and for reference purposes, the EPA defines terms and abbreviations used in appendix A (although the list of abbreviations in the appendix is not exhaustive).

*Supporting Documentation.* The rule is supported by several documents, including the following:

- *Technical Development Document for the Final Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* (TDD), Document No. 821R24004. This report summarizes the technical and engineering analyses supporting the rule. The TDD presents the EPA's updated analyses supporting the revisions to FGD wastewater, BA transport water, CRL, and legacy wastewater. The TDD includes additional data that has been collected since the publication of the 2015 and 2020 rules, updates to the industry (*e.g.,* retirements, updates to wastewater handling), cost methodologies, pollutant removal estimates, non-water quality environmental impacts associated with updated FGD and BA methodologies, and calculations for the effluent limitations. In addition to the TDD, the Technical Development Document for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (2015 TDD, Document No. EPA–821–R–15–007) and the Supplemental Technical Development Document for Revisions to the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (2020 Supplemental TDD, Document No. EPA–821–R–20–001) provide a more complete summary of the EPA's data collection, description of the industry, and underlying analyses supporting the 2015 and 2020 rules.
- *Environmental Assessment for the Final Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (EA),* Document No. 821R24005. This report summarizes the potential environmental and human health impacts estimated to result from implementation of the revisions to the 2015 and 2020 rules.
- *Benefit and Cost Analysis for the Final Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* (BCA), Document No. 821R24006. This report summarizes the societal benefits and costs estimated to result from implementation of the revisions to the 2015 and 2020 rules.
- *Regulatory Impact Analysis for the Final Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* (RIA), Document No. 821R24007. This report presents a profile of the steam electric power generating industry, a summary of estimated costs and impacts associated with the revisions to the 2015 and 2020 rules, and an assessment of the potential impacts on employment and small businesses.
- *Environmental Justice Analysis for the Final Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* (EJA), Document No. 821R24008. This report presents a profile of the communities and populations potentially impacted by this rule, an analysis of the distribution of impacts in the baseline scenario and with the revisions, and a summary of inputs from potentially impacted communities that the EPA met with prior to publishing the proposed rulemaking.
- *Docket Index for the Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category.* This document provides a list of additional memoranda, references, and other information the EPA relied on for the final revisions to the ELGs.

*Organization of this Document.* The information in this preamble is organized as follows:

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## I. Executive Summary

### *A. Purpose of Rule*

The EPA is promulgating this final supplemental rule to update requirements that apply to wastewater discharges from steam electric power plants, particularly coal-fired power plants. In 2015, the EPA set the first Federal limitations on the levels of toxic metals in several of the largest sources of wastewater that can be discharged from power plants after last updating these regulations in 1982 (80 **Federal Register** (FR) 67838; November 3, 2015) (hereinafter the ''2015 rule''). On an annual basis, the 2015 rule was projected to reduce the amount of toxic metals, nutrients, and other pollutants that steam electric power plants are allowed to discharge by 1.4 billion pounds and reduce water withdrawal by 57 billion gallons. This rule was reconsidered in 2020 and modified in part due to changing dynamics in the power sector (85 FR 64650; October 13, 2020) (hereinafter the ''2020 rule''). Steam electric power plants are increasingly aging and less competitive sources of electric power in many portions of the United States.

Steam electric power plants, coal-fired power plants in particular, are subject to several environmental regulations designed to control (and in some cases eliminate) air, water, and land pollution over time. This rule, the Steam Electric Power Generating Effluent Limitations Guidelines and Standards—or steam electric ELGs—applies to the subset of the electric power industry where ''generation of electricity is the predominant source of revenue or principal reason for operation, and whose generation of electricity results primarily from a process utilizing fossil-type fuel (*e.g.,* coal, oil, gas), fuel derived from fossil fuel (*e.g.,* petroleum coke, synthesis gas), or nuclear fuel in conjunction with a thermal cycle employing the steam-water system as the thermodynamic medium'' (40 Code of Federal Regulations (CFR) 423.10). The 2015 rule addressed discharges from FGD wastewater, fly ash (FA) transport water, BA transport water, flue gas mercury control (FGMC) wastewater, gasification wastewater, CRL, legacy wastewater, and nonchemical metal cleaning wastes. The 2020 rule modified the 2015 requirements for FGD wastewater and BA transport water for existing sources only. The 2015 limitations for CRL from existing sources and legacy wastewater were vacated by the United States (U.S.) Court of Appeals for the Fifth Circuit in *Southwestern Electric Power Co., et al.* v. *EPA,* 920 F.3d 999 (5th Cir. 2019).

In the years since the EPA revised the steam electric ELGs in 2015 and 2020, new information has become available, which the EPA considered in finalizing this supplemental rule. For example, pilot testing and full-scale use of various, better performing treatment technologies have continued to develop, along with more data and information about their performance. The final supplemental rule updates requirements for discharges from two wastestreams addressed in the 2020 rule: BA transport water and FGD wastewater at existing sources. The final supplemental rule also replaces the court-vacated limitations for CRL (except for CRL discharges in one subcategory) and a subcategory of legacy wastewater. Finally, for the remaining CRL and legacy wastewaters, this rule finalizes a site-specific approach to developing technology-based limitations based on the permitting authorities' best professional judgment (BPJ), an option discussed by the Court in *Southwestern Electric Power Co.* v. *EPA.*

### *B. Summary of Final Rule*

For existing sources that discharge directly to surface water, with the exception of the subcategories discussed below, the final rule establishes the following effluent limitations based on Best Available Technology Economically Achievable (BAT):

- A zero-discharge limitation for all pollutants in FGD wastewater, BA transport water, and CRL.



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• Numeric (nonzero) discharge limitations for mercury and arsenic in unmanaged CRL [1] and for legacy wastewater discharged from surface impoundments during the closure process if those surface impoundments have not commenced closure under the Coal Combustion Residuals (CCR) regulations as of the effective date of this rule.

The final rule eliminates the separate, 2020 rule's less stringent BAT requirements for two subcategories: high-flow facilities and low-utilization electric generating units (LUEGUs), except to the extent they apply to one new permanent cessation of coal combustion subcategory. The final rule leaves in place the existing subcategories for oil-fired and small (50 megawatts (MW) or less) electric generating units (EGUs) established in the 2015 rule. The final rule also leaves in place the existing subcategory for EGUs permanently ceasing the combustion of coal by 2028, which was established in the 2020 rule and amended in a 2023 direct final rule by extending the date for filing a Notice of Planned Participation (NOPP). *See* 88 FR 18440 (March 29, 2023). Lastly, the final rule creates a new subcategory for EGUs permanently ceasing coal combustion by 2034. For both the existing and new subcategories referenced immediately above, the EPA is finalizing additional reporting and recordkeeping requirements and zero-discharge limitations applicable after EGUs cease coal combustion, as well as procedural requirements for affected facilities to demonstrate permanent cessation of coal combustion or that permanent retirement will occur.

As stated above, the rule eliminates the 2020 rule subcategories for high flow and low utilization, except to the extent they apply to EGUs in the new permanent cessation of coal combustion by 2034 subcategory. The elimination of the 2020 rule's subcategories will affect the one known high-flow facility (the Tennessee Valley Authority (TVA) Cumberland Fossil Plant) that has indicated it is planning to close and the two known facilities with LUEGUs (GSP Merrimack LLC and Indiana Municipal Power Agency (IMPA) Whitewater Valley Station), one of which is also expected to close. For EGUs ceasing coal combustion by 2034, the final rule retains the 2020 rule requirements for FGD wastewater and BA transport water and the pre-2015 BPJ-based BAT requirements for CRL rather than requiring the new, more stringent zero-discharge requirements for these wastestreams. After the permanent cessation of coal combustion, however, EGUs in this subcategory must meet limitations on arsenic and mercury based on chemical precipitation for CRL.

Where BAT limitations in this final rule are more stringent than previously established Best Practicable Control Technology Currently Available (BPT) and BAT limitations, any new limitations for direct dischargers do not apply until a date determined by the permitting authority that is as soon as possible on or after July 8, 2024, but no later than December 31, 2029.

For indirect discharges (*i.e.,* discharges to publicly owned treatment works (POTWs)), the final rule establishes pretreatment standards for existing sources that are the same as the BAT limitations except where limitations are for total suspended solids (TSS), a pollutant that does not pass through POTWs. Pretreatment standards are directly enforceable and apply May 9, 2027.

While the EPA is not aware of any planned new sources that would be subject to the requirements of this final supplement rule, this action sets new source performance standards and pretreatment standards for discharges of CRL from new sources that are equivalent to the new BAT limitations—namely, zero discharge.

### *C. Summary of Costs and Benefits*

The EPA estimates that the final rule will cost $536 million to $1.1 billion per year in social costs and result in $3.2 billion per year in monetized benefits using a 2 percent discount rate.[2]

The EPA's analysis reflects the Agency's understanding of the actions steam electric power plants are expected to take to meet the limitations and standards in the final rule, including the implementation of additional treatment technologies to reduce pollutant discharges. The EPA based its analysis on a modeled baseline that reflects the full implementation of the 2020 rule, the expected effects of announced retirements and fuel conversions, and the anticipated impacts of relevant final rules affecting the power sector. Not all costs and benefits can be fully quantified and monetized. While some health benefits and willingness to pay (WTP) for water quality improvements have been quantified and monetized, those estimates may not fully capture all important water-quality-related benefits. Furthermore, the EPA anticipates the final rule would generate important additional benefits that the Agency was only able to analyze qualitatively (*e.g.,* improved habitat conditions for plants, invertebrates, fish, amphibians, and the wildlife that prey on aquatic organisms).

For additional information on costs and benefits, *see* sections VIII and XII of this preamble, respectively.

## II. Public Participation

During the 60-day public comment period on the 2023 proposed supplemental rule (88 FR 18824, March 29, 2023) (from March 29, 2023, to May 30, 2023), the EPA received more than 22,000 public comment submissions from private citizens, industry representatives, technology vendors, government entities, environmental groups, and trade associations. The EPA also hosted two online public hearings during the public comment period—one on April 20, 2023, and one on April 25, 2023. These hearings had a combined total of 196 attendees, 46 of whom registered to provide comment on the proposed rule. Available documents from each public hearing include the presentations given by the EPA and two transcripts (document control number (DCN) SE10469, DCN SE10469A1, DCN SE10470 and DCN SE10470A1).

## III. General Information

### *A. Does this action apply to me?*

Entities potentially regulated by any final rule following this action include the following:

[1] As discussed in section VII.C.5 of this document, the EPA is defining unmanaged CRL in this rule to mean CRL which either: (1) the permitting authority determines are the functional equivalent of a direct discharge to waters of the United States (WOTUS) through groundwater or (2) CRL that has leached from a waste management unit into the subsurface and mixed with groundwater prior to being captured and pumped to the surface for discharge directly to a WOTUS.

[2] The EPA estimated the annualized value of future benefits and costs using a discount rate of 2 percent, following current Office of Management and Budget (OMB) guidance in Circular A–4 (OMB, 2023). In appendix B of the BCA, the EPA also provides results of analyses performed using 3 percent and 7 percent discount rates to allow comparison of the final rule costs and benefits with those estimated at proposal, which followed the guidance applicable at the time the prior analysis was conducted (OMB, 2003).



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| Category | Example of regulated entity | North American Industry Classification System (NAICS) Code |
|---|---|---|
| Industry | Electric Power Generation Facilities—Electric Power Generation | 22111 |
| | Electric Power Generation Facilities—Fossil Fuel Electric Power Generation | 221112 |

This section is not intended to be exhaustive, but rather provides a guide regarding entities likely to be regulated by this final rule. Other types of entities that do not meet the above criteria could also be regulated. To determine whether a specific facility is regulated by this final rule, carefully examine the applicability criteria listed in 40 CFR 423.10 and the definitions in 40 CFR 423.11. If you still have questions regarding the applicability of this final rule to a particular entity, consult the person listed for technical information in the preceding **FOR FURTHER INFORMATION CONTACT** section.

*B. What action is the EPA taking?*

The Agency is revising certain BAT ELGs for existing sources in the steam electric power generating point source category that apply to FGD wastewater, BA transport water, CRL, and legacy wastewater.

*C. What is EPA's authority for taking this action?*

The EPA is finalizing this rule under the authority of sections 301, 304, 306, 307, 308, 402, and 501 of the CWA, 33 United States Code (U.S.C.) 1311, 1314, 1316, 1317, 1318, 1342, and 1361.

*D. What are the monetized incremental costs and benefits of this action?*

This final rule is estimated to have social costs of $536 million to $1.1 billion per year and result in $3.2 billion in benefits using a two percent discount rate.[3]

## IV. Background

*A. Clean Water Act*

Congress passed the Federal Water Pollution Control Act Amendments of 1972, also known as the CWA, to ''restore and maintain the chemical, physical, and biological integrity of the Nation's waters.'' 33 U.S.C. 1251(a). The CWA establishes a comprehensive program for protecting our nation's waters. Among its core provisions, the CWA prohibits the discharge of pollutants from a point source to waters of the United States (WOTUS), except as authorized under the CWA. Under section 402 of the CWA, discharges may be authorized through a National Pollutant Discharge Elimination System (NPDES) permit. The CWA also authorizes the EPA to establish nationally applicable, technology-based ELGs for discharges from different categories of point sources, such as industrial, commercial, and public sources.

Furthermore, the CWA authorizes the EPA to promulgate nationally applicable pretreatment standards that restrict pollutant discharges from facilities that discharge wastewater to WOTUS indirectly through sewers flowing to POTWs, as outlined in CWA sections 307(b) and (c), 33 U.S.C. 1317(b) and (c). The EPA establishes national pretreatment standards for those pollutants in wastewater from indirect dischargers that may pass through, interfere with, or are otherwise incompatible with POTW operations. Pretreatment standards are designed to ensure that wastewaters from direct and indirect industrial dischargers are subject to similar levels of treatment. *See* CWA section 301(b), 33 U.S.C. 1311(b); *Chem. Mfrs. Ass'n* v. *NRDC,* 470 U.S. 116, 119 (1985); *Envtl. Def. Fund* v. *Costle,* 636 F.2d 1229, 1235 n.15 (D.C. Cir. 1980); *Reynolds Metals Co.* v. *EPA,* 760 F.2d 549, 553 (4th Cir. 1985); *Chem. Mfrs. Ass'n* v. *EPA,* 870 F.2d 177, 249 (5th Cir. 1989). In addition, POTWs are required to implement local treatment limitations applicable to their industrial indirect dischargers to satisfy any local requirements. *See* 40 CFR 403.5.

Direct dischargers (*i.e.,* those discharging directly from a point source to surface waters rather than through POTWs) must comply with effluent limitations in NPDES permits. Discharges that flow through groundwater before reaching surface waters must also comply with effluent limitations in NPDES permits if those discharges are the ''functional equivalent'' of a direct discharge from a point source to a WOTUS. *County of Maui* v. *Hawaii Wildlife Fund,* 590 U.S. 165 (2020). Indirect dischargers, who discharge through POTWs, must comply with pretreatment standards. Technology-based effluent limitations in NPDES permits are derived from ELGs (CWA sections 301 and 304, 33 U.S.C. 1311 and 1314) and new source performance standards (CWA section 306, 33 U.S.C. 1316) promulgated by the EPA, or based on BPJ where the EPA has not promulgated an applicable effluent guideline or new source performance standard. CWA section 402(a)(1)(B), 33 U.S.C. 1342(a)(1)(B); 40 CFR 125.3(c). Additional limitations based on water quality standards are also required to be included in the permit in certain circumstances. CWA section 301(b)(1)(C), 33 U.S.C. 1311(b)(1)(C); 40 CFR 122.44(d). The EPA establishes ELGs by regulation for categories of point source dischargers, and these ELGs are based on the degree of control that can be achieved using various levels of pollution control technology.

The EPA promulgates national ELGs for major industrial categories for three classes of pollutants: (1) conventional pollutants (*i.e.,* TSS, oil and grease, biochemical oxygen demand ($BOD_5$), fecal coliform, and pH), as outlined in CWA section 304(a)(4) and 40 CFR 401.16; (2) toxic pollutants (*e.g.,* toxic metals such as arsenic, mercury, selenium, and chromium; toxic organic pollutants such as benzene, benzo-a-pyrene, phenol, and naphthalene), as outlined in section 307(a) of the Act, 40 CFR 401.15 and 40 CFR part 423, appendix A; and (3) nonconventional pollutants, which are those pollutants that are not categorized as conventional or toxic (*e.g.,* ammonia-N, phosphorus, total dissolved solids (TDS)).

*B. Relevant Effluent Guidelines*

The EPA develops effluent guidelines that are technology-based regulations for a category of dischargers. The EPA bases these regulations on the performance of control and treatment technologies. The legislative history of CWA section 304(b), which is the heart of the effluent guidelines program, describes the need to press toward higher levels of control through research and development of new processes, modifications, replacement of obsolete plants and processes, and other improvements in technology, while also accounting for the cost of controls. Legislative history and case law support that the EPA need

[3] See note 2.



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not consider water quality impacts on individual water bodies as the guidelines are developed; *see* Statement of Senator Muskie (October 4, 1972), reprinted in Legislative History of the Water Pollution Control Act Amendments of 1972, at 170. (U.S. Senate, Committee on Public Works, Serial No. 93–1, January 1973); *see also Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1005 (''The Administrator must require industry, regardless of a discharge's effect on water quality, to employ defined levels of technology to meet effluent limitations.'') (citations and internal quotations omitted).

There are many technology-based effluent limitations (TBELs) that may apply to a discharger under the CWA: four types of standards applicable to direct dischargers, two types of standards applicable to indirect dischargers, and a default site-specific approach. The TBELs relevant to this rulemaking are described in detail below.

1. Best Practicable Control Technology Currently Available

Traditionally, the EPA defines Best Practicable Control Technology (BPT) effluent limitations based on the average of the best performances of facilities within the industry, grouped to reflect various ages, sizes, processes, or other common characteristics. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F3d at 1025. The EPA may promulgate BPT effluent limitations for conventional, toxic, and nonconventional pollutants. In specifying BPT, the EPA looks at several factors. The EPA considers the cost of achieving effluent reductions in relation to the effluent reduction benefits. The Agency also considers the age of equipment and facilities, the processes employed, engineering aspects of the control technologies, any required process changes, non-water quality environmental impacts (including energy requirements), and such other factors as the Administrator deems appropriate. CWA section 304(b)(1)(B), 33 U.S.C. 1314(b)(1)(B). If, however, existing performance is uniformly inadequate, the EPA may establish limitations based on higher levels of control than what is currently in place in an industrial category, when based on an agency determination that the technology is available in another category or subcategory and can be practicably applied.

2. Best Available Technology Economically Achievable

BAT represents the second level of stringency for controlling direct discharge of toxic and nonconventional pollutants. Courts have referred to this as the CWA's ''gold standard'' for controlling discharges from existing sources. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1003; *see also Kennecott* v. *EPA,* 780 F.2d 445, 448 (4th Cir. 1985) (''The BAT standard reflects the intention of Congress to use the latest scientific research and technology in setting effluent limits, pushing industries toward the goal of zero discharge as quickly as possible.''). In general, BAT represents the best available, economically achievable performance of facilities in the industrial subcategory or category. As the statutory phrase intends, the EPA considers the technological availability and the economic achievability when determining what level of control represents BAT. CWA section 301(b)(2)(A), 33 U.S.C. 1311(b)(2)(A). Other statutory factors that the EPA considers in assessing BAT are the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the process employed, potential process changes, and non-water quality environmental impacts, including energy requirements, and such other factors as the Administrator deems appropriate. CWA section 304(b)(2)(B), 33 U.S.C. 1314(b)(2)(B). The Agency retains considerable discretion in assigning the weight to be accorded these factors. *Weyerhaeuser Co.* v. *Costle,* 590 F.2d 1011, 1045 (D.C. Cir. 1978). The EPA usually determines economic achievability based on the effect the cost of compliance with BAT limitations has on overall industry and subcategory financial conditions.

BAT reflects the highest performance in the industry and may reflect a higher level of performance than is currently being achieved based on technology transferred from a different subcategory or category, bench scale or pilot plant studies, or foreign plants. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1006; *Chem. Mfrs. Ass'n* v. EPA, 870 F.2d at 226; *Nat. Res. Def. Council* v. *EPA,* 863 F.2d 1420, 1426 (9th Cir. 1988); *American Paper Inst.* v. *Train,* 543 F.2d 328, 353 (D.C. Cir. 1976); *American Frozen Food Inst.* v. *Train,* 539 F.2d 107, 132 (D.C. Cir. 1976). BAT may be based upon process changes or internal controls, even when these technologies are not common industry practice. *See American Frozen Foods,* 539 F.2d at 132, 140; *Reynolds Metals Co.* v. *EPA,* 760 F.2d at 562; *California & Hawaiian Sugar Co.* v. *EPA,* 553 F.2d 280, 285–88 (2nd Cir. 1977). ''In setting BAT, EPA uses not the average plant, but the optimally operating plant, the pilot plant which acts as a beacon to show what is possible.'' *Kennecott* v. *EPA,* 780 F.2d at 448 (citing *A Legislative History of the Water Pollution Control Act Amendments of 1972,* 93d Cong., 1st Sess. (Comm. Print 1973), at 798). As recently reiterated by the U.S. Court of Appeals for the Fifth Circuit, ''Under our precedent, a technological process can be deemed available for BAT purposes even if it is not in use at all, or if it is used in unrelated industries. Such an outcome is consistent with Congress'[s] intent to push pollution control technology.'' *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1031 (citation and internal quotations omitted); *see also Am. Petroleum Inst.* v. *EPA,* 858 F.2d 261, 265 (5th Cir. 1988).

3. New Source Performance Standards

New Source Performance Standards (NSPS) reflect effluent reductions that are achievable based on the Best Available Demonstrated Control Technology (BADCT). Owners of new facilities have the opportunity to install the best and most efficient production processes and wastewater treatment technologies. As a result, NSPS should represent the most stringent controls attainable through the application of the BADCT for all pollutants (that is, conventional, nonconventional, and toxic pollutants). In establishing NSPS, the EPA is directed to take into consideration the cost of achieving the effluent reduction and any non-water quality environmental impacts and energy requirements. CWA section 306(b)(1)(B), 33 U.S.C. 1316(b)(1)(B).

4. Pretreatment Standards for Existing Sources

Section 307(b), 33 U.S.C. 1317(b), of the CWA calls for the EPA to issue pretreatment standards for discharges of pollutants to POTWs. Pretreatment standards for existing sources (PSES) are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs. Categorical pretreatment standards are technology-based and are analogous to BPT and BAT ELGs; thus, the Agency typically considers the same factors in promulgating PSES as it considers in promulgating BAT. The General Pretreatment Regulations, which set forth the framework for the implementation of categorical pretreatment standards, are found at 40 CFR part 403. These regulations establish pretreatment standards that apply to all non-domestic dischargers. *See* 52 FR 1586 (January 14, 1987).



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5. Pretreatment Standards for New Sources

Section 307(c), 33 U.S.C. 1317(c), of the Act calls for the EPA to promulgate Pretreatment Standards for New Sources (PSNS). Such pretreatment standards must prevent the discharge of any pollutant into a POTW that may interfere with, pass through, or may otherwise be incompatible with the POTW. The EPA promulgates PSNS based on BADCT for new sources. New indirect dischargers have the opportunity to incorporate into their facilities the best available demonstrated technologies. The Agency typically considers the same factors in promulgating PSNS as it considers in promulgating NSPS.

6. Best Professional Judgment

CWA section 301 and its implementing regulation at 40 CFR 125.3(a) indicate that technology-based treatment requirements under section 301(b) of the CWA represent the minimum level of control that must be imposed in an NPDES permit. Where EPA-promulgated effluent guidelines are not applicable to a non-POTW discharge, or where such EPA-promulgated guidelines have been vacated by a court, such treatment requirements are established on a case-by-case basis using the permit writer's BPJ. Case-by-case TBELs are developed pursuant to CWA section 402(a)(1), which authorizes the EPA Administrator to issue a permit that will meet either: all applicable requirements developed under the authority of other sections of the CWA (*e.g.,* technology-based treatment standards, water quality standards, ocean discharge criteria) or, before taking the necessary implementing actions related to those requirements, ''such conditions as the Administrator determines are necessary to carry out the provisions of this Act.'' The regulation at 40 CFR 125.3(c)(2) cites this section of the CWA, stating that technology-based treatment requirements may be imposed in a permit ''on a case-by-case basis under section 402(a)(1) of the Act, to the extent that EPA-promulgated effluent limitations are inapplicable.'' Furthermore, § 125.3(c)(3) indicates, ''[w]here promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to certain pollutants, other aspects or activities are subject to regulation on a case-by-case basis in order to carry out the provisions of the Act.'' The factors considered by the permit writer are the same as those that the EPA considers in establishing technology-based effluent limitations. *See* 40 CFR 125.3(d)(1) through (3).

*C. 2015 Steam Electric Power Generation Point Source Category Rule*

1. 2015 Rule Requirements

On November 3, 2015, the EPA promulgated a rule revising the regulations for the Steam Electric Power Generating point source category, 40 CFR part 423. 80 FR 67838, November 3, 2015. The rule set the first Federal limitations on the levels of toxic pollutants (*e.g.,* arsenic) and nutrients (*e.g.,* nitrogen) that can be discharged in the steam electric power generating industry's largest sources of wastewater, based on technology improvements in the steam electric power industry over the preceding three decades. Before the 2015 rule, regulations for the industry were last updated in 1982 and, for the industry's wastestreams with the largest pollutant loadings, contained only limitations on TSS and oil and grease.

Over those 30 years, new technologies for generating electric power and the widespread implementation of air pollution controls had altered existing wastewater streams or created new wastewater streams at many steam electric facilities, particularly coal-fired facilities. Discharges of these wastestreams include arsenic, lead, mercury, selenium, chromium, and cadmium. Once in the environment, many of these toxic pollutants can remain there for years and continue to cause adverse impacts.

The 2015 rule addressed effluent limitations and standards for multiple wastestreams generated by new and existing steam electric facilities: BA transport water, CRL, FGD wastewater, FGMC wastewater, FA transport water, gasification wastewater, and legacy wastewater.[4] The rule required most steam electric facilities to comply with the effluent limitations ''as soon as possible'' after November 1, 2018, and no later than December 31, 2023. NPDES permitting authorities established particular applicability date(s) within that range for each facility (except for indirect dischargers) at the time they reissued the facility's NPDES permit.

The 2015 rule was projected to reduce the amount of metals the CWA defines as toxic pollutants, nutrients, and other pollutants that steam electric facilities are allowed to discharge by 1.4 billion pounds per year and reduce water withdrawal by 57 billion gallons. At the time, the EPA estimated annual compliance costs for the final rule to be $480 million (in 2013 dollars, discounted at 3 percent) and estimated annual benefits associated with the rule to be $451 to $566 million (in 2013 dollars, discounted at 3 percent).

2. Vacatur of Limitations Applicable to CRL and Legacy Wastewater

Seven petitions for review of the 2015 rule were filed in various circuit courts by the electric utility industry, environmental groups, and drinking water utilities. These petitions were consolidated in the U.S. Court of Appeals for the Fifth Circuit, *Southwestern Electric Power Co.* v. *EPA,* Case No. 15–60821 (5th Cir.). On March 24, 2017, the Utility Water Act Group submitted to the EPA an administrative petition for reconsideration of the 2015 rule. On April 5, 2017, the Small Business Administration (SBA) submitted an administrative petition for reconsideration of the 2015 rule.

On August 11, 2017, then EPA Administrator Scott Pruitt announced his decision to conduct a rulemaking to potentially revise the new, more stringent BAT effluent limitations and pretreatment standards for existing sources in the 2015 rule that apply to FGD wastewater and BA transport water. The Fifth Circuit subsequently granted the EPA's request to sever and hold in abeyance petitioners' claims related to those limitations and standards, and those claims are still in abeyance. With respect to the remaining claims related to limitations applicable to legacy wastewater and CRL, the Fifth Circuit issued a decision on April 12, 2019, vacating those limitations as arbitrary and capricious under the Administrative Procedure Act and unlawful under the CWA, respectively. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d 999. In particular, the Court rejected the EPA's BAT limitations for each wastestream set equal to previously promulgated BPT limitations based on surface impoundments. In the case of legacy wastewater, the Court held that the EPA's record on surface impoundments did not support BAT limitations based on surface impoundments. *Id.* at 1015. In the case of CRL, the Court held that the EPA's setting of BAT limitations equal to BPT limitations was an impermissible conflation of the two standards, which are supposed to be progressively more stringent, and that the EPA's rationale was not authorized by the statutory factors for determining BAT. *Id.* at 1026. After the Court's decision, the EPA announced its plans to address the vacated limitations in a later action after the 2020 rule.

[4] These wastestreams are defined in appendix A to this preamble.



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In September 2017 (82 FR 43494), using notice-and-comment procedures, the EPA finalized a rule postponing the earliest compliance dates for the more stringent BAT effluent limitations and PSES for FGD wastewater and BA transport water in the 2015 rule, from November 1, 2018, to November 1, 2020 (''postponement rule''). The EPA also withdrew a prior action it had taken to stay parts of the 2015 rule pursuant to section 705 of the Administrative Procedure Act, 5 U.S.C. 705. The postponement rule received multiple legal challenges, but the courts did not sustain any of them.[5]

*D. 2020 Steam Electric Reconsideration Rule and Recent Developments*

1. 2020 Rule Requirements

On October 13, 2020, the EPA promulgated the *Steam Electric Reconsideration Rule* (85 FR 64650). The 2020 rule revised requirements for FGD wastewater and BA transport water applicable to existing sources. Specifically, the 2020 rule made four changes to the 2015 rule. First, the rule changed the technology basis for control of FGD wastewater and BA transport water. For FGD wastewater, the technology basis was changed from chemical precipitation plus high-hydraulic-residence-time biological reduction to chemical precipitation plus low-hydraulic-residence-time biological reduction. This change in the technology basis resulted in less stringent selenium limitations but more stringent mercury and nitrogen limitations. For BA transport water, the technology basis was changed from dry-handling or closed-loop systems to high-recycle-rate systems, allowing for a site-specific purge not to exceed 10 percent of the BA transport system's volume. This change in technology resulted in less stringent limitations for all pollutants in BA transport water. Second, the 2020 rule revised the technology basis for the voluntary incentives program (VIP) for FGD wastewater from vapor compression evaporation to chemical precipitation plus membrane filtration. This change in the technology basis resulted in less stringent limitations for most pollutants but added new limitations for bromide and nitrogen. Third, the 2020 rule created three new subcategories for high-flow facilities, LUEGUs, and EGUs permanently ceasing coal combustion by 2028. These subcategories were subject to less stringent limitations: high-flow facilities were subject to FGD wastewater limitations based on chemical precipitation; LUEGUs were subject to FGD wastewater limitations based on chemical precipitation and BA transport water limitations based on surface impoundments and a best management practice (BMP) plan; and EGUs permanently ceasing coal combustion by 2028 were subject to FGD wastewater and BA transport water limitations based on surface impoundments. Finally, the 2020 rule required most steam electric facilities to comply with the revised effluent limitations ''as soon as possible'' after October 13, 2021, and no later than December 31, 2025.[6] NPDES permitting authorities established the particular applicability date(s) of the new limitations within that range for each facility (except for indirect dischargers) at the time they reissued the facility's NPDES permit.

2. Fourth Circuit Court of Appeals Litigation

Two petitions for review of the 2020 rule were timely filed by environmental group petitioners and consolidated in the U.S. Court of Appeals for the Fourth Circuit on November 19, 2020. *Appalachian Voices, et al.* v. *EPA,* No. 20–2187 (4th Cir.). An industry trade group and certain energy companies moved to intervene in the litigation, which the Court granted on December 3, 2020. On April 8, 2022, the Court granted the EPA's motion and placed the case into abeyance pending the completion of the current rulemaking.

3. Executive Order 13990 and Announcement of Supplemental Rule

On January 20, 2021, President Biden issued Executive Order 13990: *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.* 86 FR 7037. Executive Order 13990 directed Federal agencies to immediately review and, as appropriate and consistent with applicable law, take action to address the promulgation of Federal regulations and other actions during the previous four years that conflict with the national objectives of protecting public health and the environment.

On July 26, 2021, the EPA announced a new rulemaking to strengthen certain wastewater pollution discharge limitations for coal-fired power plants that use steam to generate electricity (86 FR 41801, August 3, 2021). The EPA later clarified that, as part of its new rulemaking, it would be reconsidering all aspects of the 2020 rule. The EPA undertook an evidence-based, science-based review of the 2020 rule under Executive Order 13990, finding that there are opportunities to strengthen certain wastewater pollution discharge limitations. For example, the EPA discussed how treatment systems using membranes have advanced since the 2020 rule's promulgation and continue to rapidly advance as an effective option for treating a wide variety of industrial pollution, including pollution from steam electric power plants. In the announcement, the EPA also clarified that, until a new rule is promulgated, part 423 will continue to be implemented and enforced to achieve needed pollutant reductions.[7]

4. Preliminary Effluent Guidelines Plan 15

In September 2021, the EPA issued *Preliminary Effluent Guidelines Program Plan 15*.[8] This document discussed the annual review of ELGs, rulemakings for new and existing industrial point source categories, and any new or existing sources receiving further analyses. Here, in the context of the EPA's ongoing steam electric ELG rulemaking, EPA noted relevant wastestreams including pointing out that the 2015 rule limitations for CRL and legacy wastewater had been vacated and remanded to the Agency. For further discussion of the vacatur and remand of the 2015 limitations applicable to CRL and legacy wastewater, see section IV.D of this preamble.

*E. Other Ongoing EPA Rules Impacting the Steam Electric Sector*

The EPA has recently proposed or finalized several other rules to protect the nation's air, land, and water from pollution resulting from coal-fired power plants. The EPA has primarily considered these other rules to support this final rulemaking in two ways. First, when appropriate, the EPA has included the impacts of final rules in the baseline of its analyses. Second, the EPA has designed this final rule to harmonize compliance dates, subcategories, and other aspects of these rules to the extent possible and appropriate under different statutory schemes. The following sections summarize the solid waste and

[5] *See Center for Biological Diversity* v. *EPA,* No. 18–cv–00050 (D. Ariz. filed January 20, 2018); *see also Clean Water Action.* v. *EPA,* No. 18–60079 (5th Cir.). On October 29, 2018, the District of Arizona case was dismissed upon the EPA's motion to dismiss for lack of jurisdiction, and on August 28, 2019, the Fifth Circuit denied the petition for review of the postponement rule.

[6] The 2015 rule's VIP compliance date was revised to December 31, 2028, in the 2020 rule.

[7] This includes both the 2020 rule and portions of the 2015 rule which were not revised or vacated.

[8] Available online at: *www.epa.gov/system/files/documents/2021-09/ow-prelim-elg-plan-15_508.pdf.*



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air rules that are most directly relevant to the electric power sector.

1. Coal Combustion Residuals Disposal Rule

On April 17, 2015, the EPA promulgated the Disposal of Coal Combustion Residuals from Electric Utilities final rule (2015 CCR rule) (80 FR 21302). This rule finalized national regulations to provide a comprehensive set of requirements for the safe disposal of CCR, commonly referred to as coal ash, from steam electric power plants. The final 2015 CCR rule was the culmination of extensive study on the effects of coal ash on the environment and public health. The rule established technical requirements for CCR landfills and surface impoundments under subtitle D of the Resource Conservation and Recovery Act (RCRA), the Nation's primary law for regulating solid waste.

These regulations established requirements for the management and disposal of coal ash, including requirements designed to prevent leaking of contaminants into groundwater, blowing of contaminants into the air as dust, and the catastrophic failure of coal ash surface impoundments. The 2015 CCR rule also set recordkeeping and reporting requirements, as well as requirements for each plant to establish and post specific information to a publicly accessible website. The rule also established requirements to distinguish the beneficial use of CCR from disposal.

As a result of the D.C. Circuit Court decisions in *Utility Solid Waste Activities Group* v. *EPA,* 901 F.3d 414 (D.C. Cir. 2018) (''*USWAG* decision'' or ''*USWAG*''), and *Waterkeeper Alliance Inc. et al.* v. *EPA,* No. 18–1289 (D.C. Cir. filed March 13, 2019), the Administrator signed two rules: *A Holistic Approach to Closure Part A: Deadline to Initiate Closure and Enhancing Public Access to Information* (CCR Part A rule) (85 FR 53516, August 28, 2020) on July 29, 2020, and *A Holistic Approach to Closure Part B: Alternate Liner Demonstration* (CCR Part B rule) (85 FR 72506, December 14, 2020) on October 15, 2020. The EPA finalized five amendments to the 2015 CCR rule which are relevant to the management of the wastewaters covered by this ELG because these wastewaters have historically been co-managed with CCR in the same surface impoundments. First, the CCR Part A rule established a new deadline of April 11, 2021, for all unlined surface impoundments in which CCR are managed (''CCR surface impoundments''), as well as CCR surface impoundments that failed the location restriction for placement above the uppermost aquifer, to stop receiving waste and begin closure or retrofitting. The EPA established this date after evaluating the steps that owners and operators need to take for CCR surface impoundments to stop receiving waste and begin closure, and the timeframes needed for implementation. (This did not affect the ability of plants to install new, composite-lined CCR surface impoundments.) Second, the Part A rule established procedures for plants to obtain approval from the EPA for additional time to develop alternative disposal capacity to manage their wastestreams (both CCR and non-CCR) before they must stop receiving waste and begin closing their CCR surface impoundments. Third, the Part A rule changed the classification of compacted-soil-lined and clay-lined surface impoundments from lined to unlined. Fourth, the Part B rule finalized procedures potentially allowing a limited number of facilities to demonstrate to the EPA that, based on groundwater data and the design of a particular surface impoundment, the unit ensures there is no reasonable probability of adverse effects to human health and the environment. Should the EPA approve such a submission, these CCR surface impoundments would be allowed to continue to operate.

As explained in the 2015 and 2020 ELG rules, the ELGs and CCR rules may affect the same EGU or activity at a plant. Therefore, when the EPA finalized the ELG and CCR rules in 2015, and revisions to both rules in 2020, the Agency coordinated the ELG and CCR rules to minimize the complexity of implementing engineering, financial, and permitting activities. Likewise, the EPA considered the interaction of the two rules during the development of this final rule. The EPA's analytic baseline includes the final requirements of these rules using the most recent data provided under the CCR rule reporting and recordkeeping requirements. This is further described in Supplemental TDD, section 3. For more information on the CCR Part A and Part B rules, including information about their ongoing implementation, visit *www.epa.gov/coalash/coal-ash-rule.*

Concurrently with the final ELG, in a separate rulemaking, the EPA is also finalizing regulatory requirements for inactive CCR surface impoundments at inactive utilities (''legacy CCR surface impoundment'' or ''legacy impoundment'') (FR 2024–09157 (EPA–HQ–OLEM–2020–0107; FRL–7814–04–OLEM)). This action is being taken in response to the August 21, 2018, opinion by the U.S. Court of Appeals for the District of Columbia Circuit in the *USWAG* decision that vacated and remanded the provision exempting legacy impoundments from the CCR regulations. This action includes adding a definition for legacy CCR surface impoundments and other terms relevant to this rulemaking. It also requires that legacy CCR surface impoundments comply with certain existing CCR regulations with tailored compliance deadlines.

The EPA is also establishing requirements to address the risks from currently exempt solid waste management that involves the direct placement of CCR on the land. The EPA is extending a subset of the existing requirements in 40 CFR part 257, subpart D, to CCR surface impoundments and landfills that closed prior to the effective date of the 2015 CCR rule, inactive CCR landfills, and other areas where CCR is managed directly on the land. In this action, the EPA refers to these as CCR management units, or CCRMU. This rule will apply to all existing CCR facilities and all inactive facilities with legacy CCR surface impoundments subject to this final rule.

Finally, the EPA is making a number of technical corrections to the existing regulations, such as correcting certain citations and harmonizing definitions. For further information on the CCR regulations, including information about the CCR Part A and Part B rules' ongoing implementation, visit *www.epa.gov/coalash/coal-ash-rule.*

2. Air Pollution Rules and Implementation

The EPA is taking several actions to regulate a variety of conventional, hazardous, and greenhouse gas (GHG) air pollutants, including actions to regulate the same steam electric power plants subject to part 423. In light of these ongoing actions, the EPA has worked to consider appropriate flexibilities in this ELG rule to provide certainty to the regulated community while ensuring the statutory objectives of each program are achieved. Furthermore, to the extent that these actions have been published before this rule's signature and are already impacting steam electric power plant operations, the EPA has accounted for these changed operations in its Integrated Planning Model (IPM) modeling discussed in section VIII of this preamble.



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a. The Revised Cross State Air Pollution Rule Update and the Good Neighbor Plan for the 2015 Ozone National Ambient Air Quality Standards

On June 5, 2023, the EPA promulgated its final Good Neighbor Plan, which secures significant reductions in ozone-forming emissions of nitrogen oxides ($NO_X$) from power plants and industrial facilities. 88 FR 36654. The Good Neighbor Plan ensures that 23 states meet the Clean Air Act's (CAA's) ''Good Neighbor'' requirements by reducing pollution that significantly contributes to problems attaining and maintaining EPA's health-based air quality standard for ground-level ozone (or ''smog''), known as the 2015 Ozone National Ambient Air Quality Standards (NAAQS), in downwind states. Further information on this action is available on the EPA's website.[9]

As of September 21, 2023, the Good Neighbor Plan's ''Group 3'' ozone-season $NO_X$ control program for power plants is being implemented in: Illinois, Indiana, Maryland, Michigan, New Jersey, New York, Ohio, Pennsylvania, Virginia, and Wisconsin. Pursuant to court orders staying the Agency's State Implementation Plan disapproval action in the following States, the EPA is not currently implementing the Good Neighbor Plan ''Group 3'' ozone-season $NO_X$ control program for power plants in: Alabama, Arkansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Nevada, Oklahoma, Texas, Utah, and West Virginia.[10]

On January 16, 2024, the EPA signed a proposal to partially approve and partially disapprove State Implementation Plan submittals addressing interstate transport for the 2015 ozone NAAQS from Arizona, Iowa, Kansas, New Mexico, and Tennessee and proposed to include these States in the Good Neighbor Plan beginning in 2025 (89 FR 12666, February 16, 2024).

On April 30, 2021, the EPA published the final Revised Cross-State Air Pollution Rule (CSAPR) Update (86 FR 23054), which resolved 21 states' good neighbor obligations for the 2008 ozone NAAQS, following the remand of the 2016 CSAPR Update (81 FR 74504, October 26, 2016) in *Wisconsin* v. *EPA,* 938 F.3d 308 (D.C. Cir. 2019). Together, these two rules establish the Group 2 and Group 3 market-based emissions trading programs for 22 states in the eastern United States for emissions of $NO_X$ from fossil fuel-fired EGUs during the summer ozone season.

b. Clean Air Act section 111 Rule

Concurrently with the final ELG, the EPA is finalizing the repeal of the Affordable Clean Energy Rule, establishing Best System of Emissions Reduction (BSER) determinations and emission guidelines for existing fossil fuel-fired EGUs, and establishing BSER determinations and accompanying standards of performance for GHG emissions from new and reconstructed fossil fuel-fired stationary combustion turbines and modified fossil fuel-fired EGUs. Specifically, for coal-fired EGUs, the EPA is establishing final standards based on carbon capture and storage/sequestration with 90 percent capture with a compliance date of January 1, 2032 (FR 2024–09233 (EPA–HQ–OAR–2023–0072; FRL–8536–01–OAR)). For coal-fired EGUs retiring by January 1, 2039, the EPA is establishing final standards based on 40 percent natural gas co-firing with a compliance date of January 1, 2030.

While four subcategories for coal-fired EGUs were proposed, the EPA is finalizing just the two subcategories for coal-fired EGUs as described in the preceding paragraph. Consistent with 40 CFR 60.24a(e) and the Agency's explanation in the proposal, states have the ability to consider, *inter alia,* a particular source's remaining useful life when applying a standard of performance to that source.[11]

In addition, the EPA is creating an option for states to provide for a compliance date extension for existing sources of up to one year under certain circumstances for sources that are installing control technologies to comply with their standards of performance. States may also provide, by inclusion in their state plans, a reliability assurance mechanism of up to one year that under limited circumstances would allow existing EGUs that had planned to cease operating by a certain date to temporarily remain available to support reliability. Any extensions exceeding 1-year must be addressed through a state plan revision. Further information about the CAA section 111 rule is available online at *https://www.epa.gov/stationary-sources-air-pollution/greenhouse-gas-standards-and-guidelines-fossil-fuel-fired-power.*

c. Mercury and Air Toxics Standards Rule

On March 6, 2023 (88 FR 13956), the EPA published a final rule which reaffirmed that it remains appropriate and necessary to regulate hazardous air pollutants (HAP), including mercury, from power plants after considering cost. This action revoked a 2020 finding that it was not appropriate and necessary to regulate coal- and oil-fired power plants under CAA section 112, which covers toxic air pollutants. The EPA reviewed the 2020 finding and considered updated information on both the public health burden associated with HAP emissions from coal- and oil-fired power plants, as well as the costs associated with reducing those emissions under the Mercury and Air Toxics Standards (MATS). After weighing the public risks these emissions pose to all Americans (and particularly exposed and sensitive populations) against the costs of reducing this harmful pollution, the EPA concluded that it remains appropriate and necessary to regulate these emissions. This action ensures that coal- and oil-fired power plants continue to control emissions of hazardous air pollution and that the Agency properly interprets the CAA to protect the public from hazardous air emissions.

Concurrently with the final ELG, the EPA is finalizing an update to the National Emission Standards for Hazardous Air Pollutants for Coal- and Oil-Fired Electric Utility Steam Generating Units (EGUs), commonly known as the Mercury and Air Toxics Standards (MATS) for power plants, to reflect recent developments in control technologies and the performance of these plants (FR 2024–0918 (EPA–HQ–OAR–2018–0794; FRL–6716.3–02–OAR)). This final rule includes an important set of improvements and updates to MATS and also fulfills the EPA's responsibility under the Clean Air Act to periodically re-evaluate its standards in light of advancements in pollution control technologies to determine whether revisions are necessary. The improvements consist of:

- Further limiting the emission of non-mercury HAP metals from existing coal-fired power plants by significantly reducing the emission standard for filterable particulate matter (fPM), which is designed to control non-mercury HAP metals. The EPA is finalizing a two-thirds reduction in the fPM standard; [12]

[9] *See https://www.epa.gov/csapr/good-neighbor-plan-2015-ozone-naaqs.*

[10] Further information on EPA's response to the stay orders can be found online at: *https://www.epa.gov/Cross-State-Air-Pollution/epa-response-judicial-stay-orders.*

[11] See 88 FR 33240 (May 23, 2023) (invoking RULOF based on a particular coal-fired EGU's remaining useful life ''is not prohibited under these emission guidelines'').

[12] Also, the EPA is finalizing the removal of the low-emitting EGU provisions for fPM and non-mercury HAP metals.

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- Tightening the emission limit for mercury for existing lignite-fired power plants by 70 percent; [13]
- Strengthening emissions monitoring and compliance by requiring coal-and oil-fired EGUs to comply with the fPM standard using PM continuous emission monitoring systems (CEMS); [14]
- Revising the startup requirements in MATS to assure better emissions performance during startup.

Additional information on the final MATS is available on the EPA's website.[15]

d. National Ambient Air Quality Standards Rules for Particulate Matter

On February 7, 2024, the EPA Administrator signed a final rule strengthening the National Ambient Air Quality Standards for Particulate Matter (PM NAAQS) to protect millions of Americans from harmful and costly health impacts, such as heart attacks and premature death (89 FR 16202, March 6, 2024). Particle or soot pollution is one of the most dangerous forms of air pollution, and an extensive body of science links it to a range of serious and in some cases deadly illnesses. The EPA set the level of the primary (health-based) annual particulate matter ($PM_{2.5}$) standard at 9.0 micrograms per cubic meter to provide increased public health protection, consistent with the available health science. The EPA did not change the current primary and secondary (welfare-based) 24-hour $PM_{2.5}$ standards, the secondary annual $PM_{2.5}$ standard, and the primary and secondary $PM_{10}$ standards. The EPA also revised the Air Quality Index to improve public communications about the risks from $PM_{2.5}$ exposures and made changes to the monitoring network to enhance protection of air quality in communities overburdened by air pollution. More information about this action is available on the EPA's website.[16]

## V. Steam Electric Power Generating Industry Description

### A. General Description of Industry

For each previous regulatory action—the 2013 proposed rule (78 FR 34432, June 7, 2013), the 2015 final rule, the 2019 proposed rule (84 FR 64620, November 22, 2019), the 2020 final rule, and the 2023 proposed rule—the EPA provided general descriptions of the steam electric power generating industry. The Agency has continued to collect information and update this industry profile. The previous descriptions reflected the known information about the universe of steam electric power plants and incorporated final environmental regulations applicable at that time. For this rule, as described in the Supplemental TDD, section 3, the EPA has revised its description of the steam electric power generating industry (and its supporting analyses) to incorporate major changes such as additional retirements, fuel conversions, ash handling conversions, wastewater treatment updates, and updated information on capacity utilization.[17] The analyses supporting this rule use an updated baseline that incorporates these changes in the industry and include the 2015 and 2020 rules' limitations for FGD wastewater, BA transport water, CRL, and legacy wastewater. The analyses then compare the effect of the new rule's requirements to this baseline.

As described in the Regulatory Impact Analysis, of the 858 steam electric power plants in the country identified by the EPA, only those coal-fired power plants that discharge FGD wastewater, BA transport water, CRL, legacy wastewater and/or unmanaged CRL may incur compliance costs under this rule. The EPA estimates that 141 to 170 such plants may incur compliance costs under this rule, depending on the scenario used to model the occurrence of unmanaged CRL costs. See section VII.C.5 of this preamble for more information regarding subcategory for discharges of unmanaged CRL. See the EPA's memorandum, *Changes to Industry Profile for Coal-Fired Generating Units for the Steam Electric Effluent Guidelines Final Rule* (DCN SE11618), for more information about plant retirements, fuel conversions, ash handling conversions, wastewater treatment updates, and updated information on capacity utilization.

### B. Current Market Conditions and Drivers in the Electricity Generation Sector

1. Inflation Reduction Act Implementation

On August 16, 2022, President Biden signed into law the Inflation Reduction Act (IRA). The IRA marks the most significant action Congress has taken on clean energy and climate change in the nation's history. The IRA provides tax credits, financing programs, and other incentives, some of which are administered by the EPA, that will accelerate the transition to forms of energy that produce little or no GHG emissions and other water and air pollutants. As such, it includes many provisions that will affect the steam electric power generating industry, causing both direct effects through changes in the production of electricity and indirect effects on electricity demand and changes to fuel markets.

In September 2023, the EPA published a report on the effect of the IRA on the electricity sector and on the economy in general.[18] The report found that the IRA would lead to emission reductions from the electric power sector of 49 to 83 percent below 2005 levels in 2030. The associated shifts from fossil fuel generation would also lead to reductions in water and air pollution from the sector. The study also found that the IRA would lower economy-wide $CO_2$ emissions, including emissions from electricity generation and use, by 35 to 43 percent below 2005 levels in 2030. Across the end-use sectors, the study found that buildings exhibit the greatest reductions from 2005 levels of direct plus indirect $CO_2$ emissions from electricity, followed by industry and transportation. Though it focuses on changes in climate-forcing emissions (in part attributable to the models it uses), the study also implies important changes in the emissions of other pollutants throughout the economy. The EPA used IPM to evaluate the impacts of the final ELG relative to a baseline that reflects impacts from other relevant policies and environmental regulations that affect the power sector, including the IRA and other on-the-books Federal and state rules (*see* section VIII.C.2 of this preamble for more information).

[13] This level aligns with the mercury standard that other coal-fired power plants have been achieving under the current MATS.

[14] PM CEMS provide regulators, the public, and facility owners or operators with cost-effective, accurate, and continuous emission measurements. This real-time, quality-assured feedback can lead to improved control device and power plant operation, which will reduce air pollutant emissions and exposure for local communities.

[15] *See https://www.epa.gov/stationary-sources-air-pollution/mercury-and-air-toxics-standards.*

[16] *See https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm.*

[17] The data presented in the general description continue to reflect some conditions existing in 2009.The 2010 steam electric industry survey remains the EPA's best available source of information for characterizing operations across the industry in cases where the EPA has not received newer information.

[18] U.S. EPA (Environmental Protection Agency). 2023. *Electricity Sector Emissions Impacts of the Inflation Reduction Act: Assessment of Projected $CO_2$ Emission Reductions from Changes in Electricity Generation and Use.* U EPA 430–R–23–004. Available online at: *https://www.epa.gov/inflation-reduction-act/electric-sector-emissions-impacts-inflation-reduction-act.*



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2. Recent Developments in Ensuring Electric Reliability and Resource Adequacy

The nature and components of the bulk power sector have been evolving away from older and less efficient legacy fossil generation (mostly coal-fired power plants) towards more decentralized, renewable assets and flexible gas-fired generation. Stakeholders have raised concerns that centralized, dispatchable power plants are coming offline faster than new generation can replace the reliability attributes associated with them. However, a combination of technology innovation, revised market signals from the Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs), and reforms recently completed and underway by Federal Energy Regulatory Commission (FERC) are collectively poised to address current reliability challenges associated with the transition along with expected higher load growth and the increasing frequency of extreme weather events. EPA has continued to learn and engage on reliability issues, particularly as part of the Agency's implementation of the *Joint Memorandum on Interagency Communication and Consultation on Electric Reliability*.[19] As part of this process, EPA has engaged in regular meetings with Department of Energy (DOE), North American Electric Reliability Corporation (NERC), FERC, and the various ISOs/RTOs.

FERC, NERC, RTOs, and ISOs are already taking steps to ensure reliability during this period of asset evolution. Among FERC's actions to help address reliability is Order 2023, or ''Improvements to Generator Interconnection Procedures,'' which will help expedite interconnections for new assets waiting to connect to the grid. This is a very important development to ensure future resource adequacy because interconnection wait times for new energy assets entering energy markets have increased, which is stifling the ability of replacement generation to connect to the grid. FERC's final action on extreme cold weather preparedness will support the new peak demand hours, which have migrated to winter months. New reliability standards issued for inverter-based resources ''will help ensure reliability of the grid by accommodating the rapid integration of new power generation technologies, known as inverter-based resources (IBRs), that include solar photovoltaic, wind, fuel cell and battery storage resources. . . .'' [20] FERC has also undertaken various transmission-related efforts, from inter-regional transmission capacity efforts to reconductoring and dynamic line rating, that would help bolster reliability by increasing the transmission capacity of existing lines and creating incentives for new, inter-regional transmission. Increasing transmission capacity can enhance reliability by increasing the amount of generation that can access the grid to help meet demand.

Furthermore, there are new technologies coming online that can also help provide reliability attributes. The deployment of many of these technologies has been accelerating due to the incentives in the IRA. The rapid increase in energy storage deployment across the nation is an important part of future grid reliability, particularly as the duration of storage assets expands. Examples of existing and emerging storage resources include various types of fuel cells, batteries, pumped hydro-electric reservoirs, and underground hydrogen caverns. Energy storage can help buttress reliability by storing renewable energy for dispatch when demand is high. Improved management of demand response assets, better designed electricity tariff structures, aggregation of distributed resources like roof-top solar panels, and integration of behind-the-meter battery storage can further support balancing peak demand on power grids. For example, programs to manage demand, which have shown value well before the recent energy transition, incentivize customers to shift their demand during periods when there is ample supply, which can help reduce instances when supply is tight.

Despite these concerns, there are also existing procedures in place to ensure electricity system reliability and resource adequacy over both the short and long-term. For example, regional planning organizations typically have incentive or planning procedures to ensure that there is sufficient capacity to meet future demand such as day-ahead reserve and capacity markets and seasonal reserve margins. Furthermore, the EPA understands that before a unit implements a retirement decision, the unit's owner will follow the processes put in place by the relevant RTO, balancing authority, or state regulator to protect electric system reliability. These processes typically include analysis of the potential impacts of the proposed EGU retirement on electrical system reliability, identification of options for mitigating any identified adverse impacts, and, in some cases, temporary provision of additional revenues to support the EGU's continued operation until longer-term mitigation measures can be put in place.

*C. Control and Treatment Technologies*

In general, control and treatment technologies for some wastestreams have continued to advance since the 2015 and 2020 rules. Often, these advancements provide plants with additional approaches for complying with any effluent limitations. In some cases, these advancements have also decreased the associated costs of compliance. For this rule, the EPA incorporated updated information and evaluated several technologies available to control and treat FGD wastewater, BA transport water, CRL, and legacy wastewater generated by the steam electric power generating industry. See section VIII of this preamble for details on updated cost information.

1. FGD Wastewater

FGD scrubber systems are used to remove sulfur dioxide from flue gas so it is not emitted into the air. Dry FGD systems use water in their operation but generally do not discharge wastewater because it evaporates during operation. Wet FGD systems do produce a wastewater stream.

Steam electric power plants discharging FGD wastewater currently employ a variety of wastewater treatment technologies and operating/management practices to reduce the pollutants associated with FGD wastewater discharges. The EPA identified the following types of treatment and handling practices for FGD wastewater:

- Chemical precipitation. Chemicals are added as part of the treatment system to help remove suspended solids and dissolved solids, particularly metals. The precipitated solids are then removed from the solution by coagulation/flocculation followed by clarification and/or filtration. The 2015 and 2020 rules focused on a specific design that employs hydroxide precipitation, sulfide precipitation (organosulfide), and iron coprecipitation to remove suspended solids and convert soluble metal ions to insoluble metal hydroxides or sulfides. Chemical precipitation was part of the BAT technology basis for the effluent limitations in the 2015 and 2020 rules.
- High-hydraulic-residence-time biological reduction (HRTR). The EPA

[19] Available online at: *https://www.epa.gov/power-sector/electric-reliability-mou.*

[20] For further information about FERC actions to address IBRs, *see https://www.ferc.gov/news-events/news/ferc-moves-protect-grid-transition-clean-energy-resources.*



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identified three types of biological treatment systems used to treat FGD wastewater: anoxic/anaerobic fixed-film bioreactors (which target removals of nitrogen compounds and selenium), anoxic/anaerobic suspended growth systems (which target removals of selenium and other metals), and aerobic/anaerobic sequencing batch reactors (which target removals of organics and nutrients). An anoxic/anaerobic fixed-film bioreactor designed to remove selenium and nitrogen compounds using high hydraulic residence times of approximately 10 to 16 hours was part of the BAT technology basis for the effluent limitations in the 2015 rule.

- Low-hydraulic-residence-time biological reduction (LRTR). LRTR is a biological treatment system that targets removal of selenium and nitrate/nitrite using fixed-film bioreactors in smaller, more compact reaction vessels. This system differs from the HRTR biological treatment system evaluated in the 2015 rule, in that the LRTR system is designed to operate with a shorter residence time (approximately one to four hours, compared to a residence time of 10 to 16 hours for HRTR) while still achieving significant removal of selenium and nitrate/nitrite. LRTR was part of the BAT technology basis for the effluent limitations in the 2020 rule.
- Membrane filtration. A membrane filtration system (*e.g.,* microfiltration, ultrafiltration, nanofiltration, forward osmosis, electrodialysis reversal, or reverse osmosis (RO)) is designed specifically for high-TDS and high-TSS wastestreams. These systems are designed to minimize fouling and scaling associated with industrial wastewater. These systems typically use pretreatment for potential scaling agents (*e.g.,* calcium, magnesium, sulfates) combined with one or more type of membrane technology to remove a broad array of particulate and dissolved pollutants from FGD wastewater. The membrane filtration units may also employ advanced techniques, such as vibration or creation of vortexes to mitigate fouling or scaling of the membrane surfaces. Membrane filtration can achieve zero discharge by recirculating permeate from an RO system back into plant operations.
- Spray evaporation. Spray evaporation technologies, which include spray dry evaporators (SDEs) and other similar proprietary variations, evaporate water by spraying fine misted wastewater into hot gases. The hot gases allow the water to evaporate before contacting the walls of an evaporation vessel, treating wastewater across a range of water quality characteristics such as TDS, TSS, or scale forming potential. Spray evaporation technologies use a less complex treatment configuration than brine concentrator and crystallizer systems (see the description of thermal evaporation systems) to evaporate water using a heat source, such as a slipstream of hot flue gas or an external natural gas burner. Spray evaporation technologies can be used in combination with other volume reduction technologies, such as membranes, to maximize the efficiency of each process. Concentrate from an RO system can then be processed through the spray evaporation technology to achieve zero discharge by recirculating permeate from the RO system back into plant operations.
- Thermal evaporation. Thermal evaporation systems use a falling-film evaporator (or brine concentrator), following a softening pretreatment step, to produce a concentrated wastewater stream and a distillate stream to reduce wastewater volume by 80 to 90 percent and reduce the discharge of pollutants. The concentrated wastewater is usually further processed in a crystallizer that produces a solid residue for landfill disposal and additional distillate that can be reused within the plant or discharged. These systems are designed to remove the broad spectrum of pollutants present in FGD wastewater to very low effluent concentrations.
- Some plants operate their wet FGD systems using approaches that eliminate the discharge of FGD wastewater. These plants use a variety of operating and management practices to achieve this, including the following:

—Complete recycle. The FGD wastestream is allowed to recirculate. Particulates (*e.g.,* precipitates and other solids) are removed and landfilled. Water is supplemented when needed to replace water that evaporated or was removed with landfilled solids. This process does not produce a saleable product (*e.g.,* wallboard grade gypsum) but it does not need a wastewater purge stream to maintain low levels of chlorides.

—Evaporation impoundments. Some plants located in warm, dry climates use surface impoundments as holding basins where the FGD wastewater is retained until it evaporates. The evaporation rate from these impoundments is greater than the flow rate of the FGD wastewater and amount of precipitation entering the impoundments; therefore, there is no discharge to surface water.[21] These impoundments must be large enough to accommodate extreme precipitation events to prevent overtopping and runoff.

—FA conditioning. Many plants that operate dry FA handling systems use the water from their FGD system in the FA handling system to suppress dust or improve handling and/or compaction characteristics in an on-site landfill.

—Combination of wet and dry FGD systems. The dry FGD process involves atomizing and injecting wet lime slurry, which ranges from approximately 18 to 25 percent solids, into a spray dryer. The water contained in the slurry evaporates from the heat of the flue gas within the system, leaving a dry residue that is removed from the flue gas using a fabric filter (*i.e.,* baghouse) or electrostatic precipitator.

—Underground injection. These systems dispose of wastes by injecting them into a permitted underground injection well as an alternative to discharging wastewater to surface waters.

The EPA also collected information on other FGD wastewater treatment technologies, including direct contact thermal evaporators and ion exchange. These treatment technologies have been evaluated, in full- or pilot-scale, or are being developed to treat FGD wastewater. More information on these technologies is available in section 4.1 of the Supplemental TDD.

2. BA Transport Water

BA (bottom ash) consists of heavier ash particles that are not entrained in the flue gas and fall to the bottom of the furnace. In most furnaces, the hot BA is quenched in a water-filled hopper.[22] Some plants use water to transport (sluice) the BA from the hopper to an impoundment or dewatering bins. The water used to transport the BA to the impoundment or dewatering bins is usually discharged to surface water as overflow from the systems after the BA has settled to the bottom. The industry also uses the following BA handling systems that generate BA transport water:

- Remote mechanical drag system (MDS). These systems transport BA to a remote MDS using the same processes as wet-sluicing systems. A drag chain conveyor pulls the BA out of the water bath on an incline to dewater the BA. The system can be operated either as a

[21] Such impoundments must be lined based on the requirements in the CCR rule. This lining would significantly reduce the potential for a discharge through groundwater that would be the functional equivalent of a direct discharge to a WOTUS.

[22] Consistent with the 2015 and 2020 rule, EGU slag is considered BA.

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closed-loop system (part of the technology basis for the 2015 rule) or a high-recycle-rate system (technology basis for the 2020 rule).[23]

- Mobile MDS. This technology is a smaller, mobile version of a remote MDS with an additional clarification system. It is not intended to be a permanent installation, which allows facilities to reduce capital costs. Once in place, the system works like a remote MDS—the incoming water is clarified and primary separation occurs. The clarified water is taken from the mechanical drag system to a mobile clarifier and polished to a level suitable for recirculation. The mobile clarifier thickens the collected solids, which are then sent back to the mechanical drag system portion and mixed with coarse BA. This mixture is sent up an incline, dewatered, and disposed of.
- Dense slurry system. These systems use a dry vacuum or pressure system to convey the BA to a silo (as described below for the ''dry vacuum or pressure system''), but instead of using trucks to transport the BA to a landfill, the plant mixes the BA with a lower percentage of water compared to a wet-sluicing system and pumps the mixture to the landfill.

As part of the 2020 rule and this rule, the EPA identified the following BA handling systems that do not, by definition or practice, generate BA transport water.

- MDS. These systems are located directly underneath the EGU. The BA is collected in a water quench bath. A drag chain conveyor pulls the BA out of the water bath along an incline to dewater the BA.
- Dry mechanical conveyor. These systems are located directly underneath the EGU. The system uses ambient air to cool the BA in the boiler and then transports the ash out from under the EGU using a conveyor. There is no water used in this process.
- Dry vacuum or pressure system. These systems transport BA from the EGU to a dry hopper without using any water. Air is percolated through the ash to cool it and combust unburned carbon. Cooled ash then drops to a crusher and is conveyed via vacuum or pressure to an intermediate storage destination.
- Vibratory belt system. These systems deposit BA on a vibratory conveyor trough, where the ash is air-cooled and ultimately moved through the conveyor deck to an intermediate storage destination without using any water.
- Submerged grind conveyor. These systems are located directly underneath the EGU and are designed to reuse slag tanks, ash gates, clinker grinders, and transfer enclosures from the existing wet sluicing systems. The system collects BA from the discharge of each clinker grinder. A series of submerged drag chain conveyors transport and dewater the BA.

More information on these technologies is available in section 4.2 of the Supplemental TDD.

3. CRL

In promulgating the 2015 rule, the EPA determined that CRL from landfills and impoundments includes similar types of constituents as FGD wastewater, albeit at potentially lower concentrations and smaller volumes. Based on this characterization of the wastewater and knowledge of treatment technologies, the EPA determined that certain treatment technologies identified for FGD wastewater could also be used to treat CRL. These technologies, described in section V.C.1 of this preamble, include chemical precipitation, biological treatment (including LRTR), membrane filtration, spray evaporation, or other thermal treatment options. The EPA also identified other management and reuse strategies from responses to the 2010 *Questionnaire for the Steam Electric Power Generating Effluent Guidelines,* or steam electric survey, which included using CRL from either an impoundment or landfill for moisture conditioning FA, dust control, or truck wash. The EPA also identified plants that collect CRL from impoundments and recycle it directly back to the impoundment.

4. Legacy Wastewater

Legacy wastewater can be composed of FGD wastewater, BA transport water, FA transport water, CRL, gasification wastewater and/or FGMC wastewater generated before the ''as soon as possible'' date that more stringent effluent limitations from the 2015 or 2020 rules would apply. Discharges of legacy wastewater may occur through an intermediary source (*e.g.,* a tank or surface impoundment) or directly into a surface waterbody, with the vast majority of legacy wastewater currently contained in surface impoundments resulting from treating the wastestreams listed above to the previously established BPT limitations. The record indicates that the following technologies can be applied to treat this type of legacy wastewater: chemical precipitation, biological treatment (including LRTR), membrane filtration, spray evaporation, and other thermal treatment options. These technologies are described in section V.C.1 of this preamble. Another option, which may be used in combination with other systems such as chemical and physical treatment, is zero valent iron (ZVI).

- ZVI. This technology can be used to target specific inorganics, including selenium, arsenic, nitrate, and mercury in this type of legacy wastewater. The technology entails mixing influent wastewater with ZVI (iron in its elemental form), which reacts with oxyanions, metal cations, and some organic molecules in wastewater. ZVI causes a reduction reaction in these pollutants, after which the pollutants are immobilized through surface adsorption onto iron oxide coated on the ZVI or generated from oxidation of elemental iron. The coated, or spent, ZVI is separated from the wastewater with a clarifier. The quantity of ZVI required and number of reaction vessels can vary based on the composition and amount of wastewater being treated.

The EPA recognizes that the characterization of legacy wastewater differs within the layers of a CCR impoundment as it is dewatered and prepared for closure. Therefore, treatment requirements may change as closure continues. Wastewater characteristics may also differ across CCR impoundments due to the different types of fuels burned at the plant, duration of pond operation, and ash type. Each of the treatment technologies identified for legacy wastewater above is applicable to all legacy wastewaters; treatment may require a combination of those technologies (*e.g.,* chemical precipitation and membrane filtration).

In addition, solids dewatering is necessary to dredge CCR materials from the impoundment. Mobile dewatering systems are typically self-contained units on a trailer, allowing for the entire system to be easily moved on-site and off-site. Legacy wastewater from a holding area (*e.g.,* pit, pond, collection tank) is pumped through a filter press to generate a filter cake and water stream. A shaker screen can be added to the treatment train to remove larger particles prior to the filter press. Furthermore, the filter press can be equipped with automated plate shifters to allow solids to drop from the end of the trailer directly into a loader or truck. The resulting wastestream may be further treated to meet any discharge requirements.

[23] In some cases, additional treatment may be necessary to maintain a closed-loop system. This additional treatment could include polymer addition to enhance removal of suspended solids or membrane filtration of a slipstream to remove dissolved solids.



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## VI. Data Collection Since the 2020 Rule

### *A. Information from the Electric Utility Industry*

#### 1. Data Requests and Responses

In January 2022, the EPA requested the following pollution treatment system performance and cost information for coal-fired power plants from three steam electric power companies:

- FGD wastewater installations of the following technologies: thermal technology; membrane filtration technology; paste, solidification, or encapsulation of FGD wastewater brine; electrodialysis; and electrocoagulation.
- Overflow from an MDS, a compact submerged conveyor, or remote MDS installations, including purge rate and management from remote MDS systems, as well as any pollutant concentration data to characterize the overflow or purge.
- CRL treatment from on-site or off-site testing (full-, pilot-, or laboratory-scale).
- On-site or off-site testing (full-, pilot-, or laboratory-scale) and/or implementation of treatment technologies associated with surface impoundment dewatering treatment.
- Costs associated with these technologies.

In addition, after meeting with four additional power companies, the EPA sent each company a voluntary request inviting them to provide the same data described above.

In July 2023, the EPA requested any full-, pilot-, or laboratory-scale data associated with on-site or off-site testing or implementation of a recently commissioned spray dryer evaporator for FGD wastewater and legacy wastewater at a coal-fired power plant from Minnesota Power. The EPA also requested information on pretreatment or disposal systems necessary for continued spray dryer evaporator operations and any corresponding documentation (*e.g.,* wastestreams generated, process flow diagram).

#### 2. Meetings With Individual Utilities

To gather information to support this supplemental rule, the EPA met with representatives from four utilities. Two of these utilities reached out to the EPA after the announcement of the supplemental rulemaking. The EPA contacted the remaining utilities due to their known or potential consideration of membrane filtration. At these meetings, the EPA discussed the operation of the utility's coal-fired EGUs and the treatment and management of BA transport water, FGD wastewater, legacy wastewater, and CRL since the 2020 rule. The EPA learned about updates associated with plant operations and studies at these plants, which were originally discussed during the 2015 and 2020 rules.

The objectives of these meetings were to gather general information about coal-fired power plant operations; pollution prevention and wastewater treatment system operations; ongoing pilot or laboratory scale study information for FGD wastewater treatment; BA system performance, characterization, and quantification of the overflow and purge from remote MDS installations; and treatment technologies and pilot testing associated with CRL and legacy wastewater. The EPA used this information to supplement the data collected in support of the 2015 and 2020 rules.

#### 3. Voluntary CRL Sampling

In December 2021, the EPA invited eight steam electric power companies to participate in a voluntary program designed to obtain data to supplement the wastewater characterization data set for CRL. The EPA requested these data from facilities believed to have constructed new landfills pursuant to the 2015 CCR rule. Six power companies chose to participate in this program. The EPA incorporated these data into the CRL analytical dataset used to estimate pollutant loadings. More information on estimated CRL pollutant loadings is available in section 6 of the Supplemental TDD.

#### 4. Electric Power Research Institute Voluntary Submission

The Electric Power Research Institute (EPRI) conducts industry-funded studies to evaluate and demonstrate technologies that can potentially remove pollutants from wastestreams or eliminate wastestreams using zero-discharge technologies. Following the 2015 rule, the EPA reviewed 35 EPRI reports published between 2011 and 2018 that were voluntarily provided regarding characteristics of FGD wastewater, FGD wastewater treatment pilot studies, BA transport water characterization, BA handling practices, halogen addition rates, and the effect of halogen additives on FGD wastewater. For this supplemental rule, EPRI provided an additional 25 reports generated since 2018. The EPA used the information in these reports to inform treatment technology performance and to update methodologies for estimating costs and pollutant removals associated with candidate treatment technologies.

#### 5. Meetings With Trade Associations

In 2021 and 2022, the EPA met with the Edison Electric Institute and the American Public Power Association. These trade associations represent investor-owned utilities and community-owned utilities, respectively. They provided information and perspectives on the status of many utilities transitioning away from coal. The EPA also participated in meetings with one trade association following the 2023 proposed rule. This association requested meetings with the EPA to discuss the association's public comments.

### *B. Notices of Planned Participation*

The 2020 rule required facilities to file a Notice of Planned Participation (NOPP) with their permitting authority no later than October 13, 2021, if the facility wished to participate in the LUEGU subcategory, the permanent cessation of coal combustion by 2028 subcategory, or in the VIP. For the permanent cessation of coal combustion by 2028 subcategory, this filing date was extended by a 2023 direct final rule to June 27, 2023. 88 FR 18440. While the facilities were not required to provide copies of the NOPPs to the Agency, the EPA nevertheless obtained a number of these filings. Some facilities provided the EPA a courtesy copy when filing with the relevant permitting authority. The Agency received notice of other filings when a state permitting authority sent new draft permits or modifications to the EPA for review. The EPA also asked some states for NOPPs after those states asked the EPA questions about the process or initiated discussions about specific plants. Environmental groups that collected some additional information about NOPPs also shared the information with EPA prior to the publication of the proposed rule.

The EPA is currently aware of NOPPs covering 94 EGUs at 38 plants. At the time of the proposed rule, four EGUs (at two plants) requested participation in the LUEGU subcategory, an additional 12 EGUs (at four plants) requested participation in the 2020 rule VIP, and the remaining 74 EGUs (at 33 plants) requested participation in the permanent cessation of coal combustion by 2028 subcategory.[24] Following the 2023 direct final rule, the EPA obtained one additional NOPP stating that two EGUs (at one plant) requested participation in the permanent cessation

[24] Plant Scherer filed a permanent cessation of coal combustion by 2028 NOPP for two EGUs and a 2020 rule VIP NOPP for the remaining two EGUs; thus, the plant count for the three groupings does not equal 38.



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of coal combustion subcategory by 2028 instead of the 2020 rule VIP. The EPA notes that these counts are not a comprehensive picture of facilities' plans for two reasons. First, the EPA was unable to obtain information for all plants and states. Second, even where a facility has filed a NOPP, under the transfer provisions of 40 CFR 423.13(o)(1)(ii), it still retains flexibility to transfer between subcategories, or between a subcategory and the 2020 VIP provisions, until December 31, 2025.[25] For example, the EPA made industry profile updates to some of the 90 EGUs with corresponding NOPPs based on public comments and other power company data (*e.g.,* integrated resource planning reports). For further detail, the NOPPs the EPA is aware of have been placed in the docket along with a memorandum summarizing the information and providing record index numbers for locating each facility, entitled *Changes to Industry Profile for Coal-Fired Generating Units for the Steam Electric Effluent Guidelines Final Rule* (DCN SE11618).

### *C. Information from Technology Vendors and Engineering, Procurement, and Construction Firms*

The EPA gathered data on the availability and effectiveness of FGD wastewater, BA handling, CRL, and surface impoundment dewatering operations and wastewater treatment technologies from technology vendors and engineering, procurement, and construction firms through presentations, conferences, meetings, and email and phone contacts. These collected data informed the development of the technology costs and pollutant removal estimates for FGD wastewater, BA transport water, CRL, and legacy wastewater.

### *D. Other Data Sources*

The EPA gathered information on steam electric generating facilities from the DOE's Energy Information Administration (EIA) Forms EIA–860 (Annual Electric Generator Report) and EIA–923 (Power Plant Operations Report). The EPA used the 2019, 2020, and 2021 data to update the industry profile, including commissioning dates, energy sources, capacity, net generation, operating statuses, planned retirement dates, ownership, and pollution controls at the EGUs. The EPA also referenced 2022 EIA data to support the analysis of FGD halogen (bromide and iodine) loads. Finally, the EPA used a 2024 EIA study as the basis for estimating the costs of a new coal-fired steam power plant.[26]

The EPA conducted literature and internet searches to gather information on FGD wastewater treatment technologies, including information on pilot studies, applications in the steam electric power generating industry, and implementation costs and timelines. The EPA also used internet searches to identify or confirm reports of planned facility plant and EGU retirements and reports of planned unit conversions to dry or closed-loop recycle ash handling systems. The EPA used this information to inform the industry profile and identify process modifications occurring in the industry.

## VII. Final Regulation

### *A. Description of the Options*

The EPA analyzed four main regulatory options at proposal, the details of which were discussed in the proposed rule. *See* 88 FR 18824, 18837–18838 (Mar. 29, 2023). For the final rule, the EPA evaluated three main regulatory options, as shown in table VII–1 of this preamble. Option A corresponds to the proposed regulation with modifications, while Options B and C would require controls that would achieve greater pollutant reductions. All three options include the same technology basis for FGD wastewater (zero-discharge systems) and BA transport water (dry-handling or closed-loop systems), while incrementally increasing controls on CRL and legacy wastewater and removing certain subcategories as one moves from Option A to Option C. Each successive option from Option A to Option C would achieve a greater reduction in wastewater pollutant discharges. Each subcategorization is described further in section VII.C of this preamble.

#### 1. FGD Wastewater

Under all three main options, the EPA would require zero discharge of FGD wastewater based on zero-discharge technologies and retain the 2020 FGD wastewater limitations and standards as an interim step toward achievement of zero-discharge requirements. Under all three options, the EPA would also eliminate the BAT and PSES subcategorizations for high-FGD-flow facilities and LUEGUs. Options A and B would also create a subcategory for EGUs that will permanently cease coal combustion no later than December 31, 2034, and instead of zero discharge would require discharges from these facilities to meet the 2020 rule limitations as included in their CWA permit. This subcategory modifies the proposed early adopters subcategory and is described further in section VII.C of this preamble. Under Option C, the EPA would not finalize a subcategory for those EGUs planning to cease coal combustion by December 31, 2034. Note that, for all three options, the EPA would retain the 2020 subcategory for EGUs permanently ceasing coal combustion by 2028.

#### 2. BA Transport Water

Under all three main options, the EPA would require zero discharge of BA transport water based on dry-handling or closed-loop systems and retain the 2020 BA transport water limitations and standards as an interim step toward achievement of zero-discharge requirements. For all three options, the EPA would also eliminate the BAT and PSES subcategorizations for LUEGUs. Options A and B would also create a subcategory for EGUs that will permanently cease coal combustion no later than December 31, 2034, and instead would require discharges from these facilities to meet the 2020 rule limitations as permitted. Under Option C, the EPA would not finalize this subcategory. Note that, for all three options, the EPA would retain the 2020 subcategory for EGUs permanently ceasing coal combustion by 2028.

#### 3. CRL

Under Option A, the EPA would establish BAT limitations and PSES for mercury and arsenic based on chemical precipitation treatment. Under Options B and C, BAT limitations and PSES would be zero discharge and the EPA would establish BAT limitations for mercury and arsenic based on chemical precipitation for discharges of unmanaged CRL. Options A and B would also create a subcategory for EGUs that would permanently cease coal combustion no later than December 31, 2034; CRL discharges from EGUs in this subcategory would be subject to case-by-case BPJ decision-making until permanent cessation of coal combustion, after which they would be subject to mercury and arsenic limitations based on chemical precipitation. Under Option C, the EPA would not finalize this subcategory.

#### 4. Legacy Wastewater

Under Option A, the EPA would not specify a nationwide technology basis for BAT/PSES applicable to legacy

[25] The ability to transfer into the LUEGU subcategory ended on December 31, 2023.

[26] U.S. Energy Information Administration (2024). *Capital Cost and Performance Characteristics for Utility-Scale Electric Power Generating Technologies,* available at: *https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capital_cost_AEO2025.pdf.*



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wastewater at this time and such limitations would be derived on a site-specific basis by the permitting authorities, using their BPJ. Under Options B and C, the EPA would establish a subcategory for discharges of legacy wastewater discharged from surface impoundments commencing closure after July 8, 2024. For such discharges, the EPA would establish mercury and arsenic limitations based on chemical precipitation.

**Table VII-1. Main Regulatory Options**

| Wastestream | Subcategory | Technology Basis for the BAT/PSES Regulatory Options | | |
|---|---|---|---|---|
| | | A | B (Final Rule) | C |
| FGD wastewater | N/A | Zero-discharge systems | Zero-discharge systems | Zero-discharge systems |
| | High-FGD-flow facilities/LUEGUs | NS | NS | NS |
| | EGUs permanently ceasing coal combustion by 2028 | Surface impoundments | Surface impoundments | Surface impoundments |
| | EGUs permanently ceasing coal combustion by 2034 | 2020 rule limitations as permitted | 2020 rule limitations as permitted | NS |
| BA transport water | N/A | Dry-handling or closed-loop systems | Dry-handling or closed-loop systems | Dry-handling or closed-loop systems |
| | LUEGUs | NS | NS | NS |
| | EGUs permanently ceasing coal combustion by 2028 | Surface impoundments | Surface impoundments | Surface impoundments |
| | EGUs permanently ceasing coal combustion by 2034 | 2020 rule limitations as permitted | 2020 rule limitations as permitted | NS |
| CRL | N/A | Chemical precipitation | Zero-discharge systems | Zero-discharge systems |
| | Discharges of unmanaged CRL | NS | Chemical precipitation | Chemical precipitation |
| | EGUs permanently ceasing coal combustion by 2034 | Reserved; Chemical precipitation after closure | Reserved; Chemical precipitation after closure | NS |
| Legacy wastewater | N/A | Reserved | Reserved | Reserved |
| | Legacy wastewater discharged from surface impoundments commencing closure after **July 8, 2024** | NS | Chemical precipitation | Chemical precipitation |

N/A = Not applicable

NS = Not subcategorized

Note: The table above does not present existing subcategories included in the 2015 rule or the 2020 VIP for FGD wastewater. The EPA did not propose, nor is it finalizing, any changes to the existing 2015 rule subcategorization of oil-fired units, units with a nameplate capacity of 50 MW or less, or the 2020 VIP.

*B. Rationale for the Final Rule*

After considering the technologies described in this preamble and the TDD, as well as public comments, and in light of the factors specified in CWA sections 301(b)(2)(A) and 304(b)(2)(B) (*see* section IV of this preamble), the EPA is establishing BAT effluent limitations based on the technologies described in Option B.[27] While the EPA is establishing new BAT effluent limitations for FGD wastewater and BA transport water based on more stringent technologies than the 2020 rule, the EPA is retaining the 2020 rule BAT effluent limitations for discharges before the applicability dates for new limitations on these wastewaters.

1. FGD Wastewater

The EPA is identifying zero-discharge systems as the technology basis for establishing BAT limitations to control pollutants discharged in FGD wastewater.[28] More specifically, the technology basis for BAT is membrane filtration systems, SDEs, and thermal evaporation systems, alone or in any combination, including any necessary pretreatment (*e.g.,* chemical precipitation) or post-treatment (*e.g.,* crystallization).[29] Furthermore, where a permeate or distillate is generated from the final stage of treatment, the BAT technology basis uses a process wherein this water would then be recycled back into the plant as either FGD makeup water or EGU makeup water.[30] After considering the factors specified in CWA section 304(b)(2)(B), the record shows that this suite of technologies is technologically available, is economically achievable, and has acceptable non-water quality environmental impacts. It is the EPA's intent that these three technologies considered together constitute BAT for FGD wastewater, and the EPA concludes that this BAT basis meets the requisite statutory factors. The EPA also finds, however, that each of the individual technologies within this suite supports a BAT determination on its own.

In the following subsections, the EPA discusses its rationale for selecting three zero-discharge systems as BAT for the control of FGD wastewater, as well as how each individual zero-discharge technology supports the BAT technology basis on its own. The EPA also explains why it is not selecting a less stringent technology as BAT. For further discussion of the changes (now being finalized by the EPA) to the definition of FGD wastewater related to infrequent storm events and decommissioning wastewater, see section VII.B.5 of this preamble. For further discussion of the EPA's retention of the 2020 rule limitations as interim limitations, see section VII.C.7 of this preamble.

a. The EPA selects zero-discharge systems as BAT for FGD wastewater.

*Technological availability of zero-discharge systems.* At proposal, the EPA identified membrane filtration as a potential BAT on which to base zero-discharge limitations for FGD wastewater, but also solicited comment on several other zero-discharge technologies, such as thermal evaporation systems and SDEs, that the EPA thought might serve alone or in any combination as the BAT basis for a final rule.

The EPA received many comments that were specific to individual zero-discharge technologies, including both comments supporting and opposed to a finding of technological availability for these individual technologies as part of the BAT basis. Comments supporting zero-discharge limitations pointed to the large number of operating zero-discharge plants and pilot studies as evidence that more than just the best performing plant or pilot plants are using zero-discharge systems. Comments opposing such a finding primarily focused on membrane filtration, the EPA's proposed zero-discharge technology basis under the preferred regulatory option. The two concerns raised most commonly in opposition to the finding of membrane filtration availability were, first, that the EPA did not collect sufficient additional information to alter its findings in the 2020 rule regarding this technology's availability and, second, that the pilot studies and foreign plants cited by the EPA were conducted on small FGD wastewater flows that were not representative of domestic industry operations. For both membrane filtration systems and thermal evaporation systems, commenters who opposed a finding of availability also questioned whether back-end management options were available for the associated wastes from zero-discharge systems. To the extent it received comments suggesting that waste management alternatives are not available, the EPA has addressed these comments in the subsection discussing non-water quality environmental impacts, below.

After consideration of public comments and as further discussed below, the EPA is basing its determination that zero-discharge systems are available for control of pollutants found in FGD wastewater on the numerous full-scale domestic and foreign installations of zero-discharge systems to treat FGD wastewater, the large number of successful domestic and international pilot tests of zero-discharge systems on FGD wastewater, successful use of zero-discharge systems on other steam electric wastestreams, and the use of zero-discharge systems on wastestreams in many different industries besides the steam electric power generating industry. Alternatively, the EPA is basing its determination that each of the technologies that make up the suite of zero-discharge systems forming the BAT basis, standing alone, is available on the several full-scale domestic and/or

[27] The EPA is including severability language in the final rule that makes clear that if any provisions of the final rule are reviewed and vacated by a court, it is the EPA's intent that as many portions of the rule remain in effect as possible.

[28] As described in section VII.B.5 of this preamble, the EPA is also finalizing a definitional change to certain wastewaters, including FGD wastewater, that excludes discharges necessary as a result of high intensity, infrequent storm events, as well as wastewater removed from FGD wastewater treatment equipment within the first 120 days of decommissioning the equipment.

[29] While three main technologies are listed here and are used to evaluate costs and non-water quality environmental impacts, the list is not meant to exclude use of other known zero-discharge treatment processes, including FA fixation, direct encapsulation, or evaporation ponds.

[30] The 2020 rule finalized a carve out from the definition of FGD wastewater applicable to ''treated FGD wastewater permeate or distillate used as boiler makeup water.''

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foreign installations of each of these technologies to treat FGD wastewater and/or the successful domestic and international pilot tests of each of these technologies on FGD wastewater. The availability of each technology standing alone is also supported by the successful use of each of these technologies on other steam electric wastestreams and/or the use of each of these technologies on wastestreams in different industries besides the steam electric power generating industry. The weight of the evidence supports the Agency's conclusion that the suite of zero-discharge systems (or each of the individual technologies alone) are available in the industry to control FGD wastewater discharges, notwithstanding certain uncertainties the EPA described in the 2020 rule about one of the technologies that form the zero-discharge BAT technology basis. Agencies have inherent authority to reconsider past decisions and to revise, replace, or repeal a decision to the extent permitted by law and supported by a reasoned explanation. *FCC* v. *Fox Television Stations, Inc.,* 556 U.S. 502, 515 (2009); *Motor Vehicle Mfrs. Ass'n* v. *State Farm Mutual Auto. Ins. Co.,* 463 U.S. 29, 42 (1983). A finding that zero-discharge systems are available, or that each of the zero-discharge technologies forming the BAT basis is available, is also consistent with the technology-forcing nature of BAT as described in the legislative history and legal precedents discussing this provision (*see* section IV.B.2 of this preamble).

*Full-scale domestic zero-discharge systems.* In the 2020 rule, the EPA rejected membrane filtration as a standalone BAT technology basis due in part to the lack of a single full-scale domestic installation, which is still the case today. In that rule, however, the EPA did not evaluate a technology basis that includes the three zero-discharge technologies that form this final rule's BAT basis.

First, the EPA notes that 40 coal-fired power plants in the United States currently (as of 2024) operate wet FGD systems and manage their wastewater to achieve zero discharge.[31] These plants achieve zero discharge using evaporation ponds, recycling of FGD wastewater, ash fixation, thermal evaporation systems (*e.g.,* falling film evaporators), or SDEs. About 19 additional plants operated zero-discharge systems for FGD wastewater since 2009 but have since retired or converted fuels such that the FGD wastewater generation, and associated zero-discharge operations, have ceased. In total, more domestic facilities operate, or have operated, zero-discharge systems than the biological treatment systems used as the 2015 and 2020 rule bases.[32] Not only are there more of these systems, but the systems for which the EPA has information have achieved continuous, long-term zero discharge.

With respect specifically to the BAT basis identified in this final rule, the EPA finds that there are four U.S. coal-fired power plants currently operating full-scale thermal and three U.S. coal-fired power plants currently operating full-scale SDE systems.[33] The full-scale domestic application of the technologies identified in the BAT basis for this final rule support the EPA's finding that the BAT technology basis is available, as that term is used in the CWA. It also supports a finding that thermal evaporation systems are technologically available on their own and that SDEs are technologically available on their own.

*Full-scale, foreign zero-discharge systems and zero-discharge pilot plants.* While the full-scale, domestic operation of zero-discharge systems is sufficient to determine availability of the BAT technology basis, the EPA has also identified a number of full-scale, foreign zero-discharge systems, as well as domestic and international pilot systems; these could additionally or separately support the EPA's conclusion that the BAT basis identified in this final rule is available.

In 2020, the EPA declined to find that full-scale, foreign installations of membrane filtration demonstrated the availability of that technology, in large part because the EPA had not visited these systems or obtained long-term performance data on them, and thus stated there were uncertainties around these applications that prevented a finding of availability. At the time of the 2020 rule, the Agency cited 12 foreign installations of membrane filtration systems on FGD wastewater.[34] These systems began operating as early as 2015, and all of them were designed to operate as zero-discharge systems.[35] Importantly, however, the EPA did not dispute the availability of thermal evaporation systems in the 2020 rule. This is consistent with the record, as even at the time of the 2015 rule, the EPA visited three thermal evaporation systems operating in Italy, obtaining relevant performance data on these systems, which it then used to establish BAT limitations for a voluntary incentive program based on such technology, as well as NSPS for FGD wastewater.[36]

Some commenters on the 2023 proposal reiterated the EPA's 2020 rule findings and argued that EPA has not collected sufficient new information on foreign installations of membrane filtration to reverse its 2020 findings. EPA first notes that, for this final rule, it has modified its BAT basis from proposal to consist of three zero-discharge systems (each of which was described in the proposal). Since the 2015 rule, EPA has collected information not just about membrane filtration systems abroad, but also about an additional four thermal evaporation systems and six SDE systems operating on FGD wastewater outside the United States.[37] The EPA finds that, when combined with the site visits and performance data EPA obtained on the three Italian thermal evaporation systems as part of the 2015 rulemaking, the current record is more than sufficient to determine, based on full-scale, foreign installations, that the suite of systems forming the BAT basis in this rule is available as that term is used in the CWA.

[31] One of these 40 plants, which was already achieving zero discharge of its FGD wastewater, is now installing SDE. See *https://www.woodplc.com/insights/articles/engineering-solutions-for-wastewater-treatment* (DCN SE10284).

[32] The EPA accounted for four plants operating biological treatment systems in the 2015 rule analyses (DCN SE05832) and nine plants in the 2020 rule analyses (DCN SE08629).

[33] In the 2020 rule and 2023 proposal, the EPA has continually deferred to one company's representations that, contrary to representations from the technology vendor, its membrane filtration system is a long-term pilot system rather than a full-scale installation. This is a distinction without a difference, as the EPA can rely on both full-scale installations and pilot plants in establishing BAT limitations. Therefore, the EPA addresses this system in the section on pilot systems below (even though it could arguably be used to treat the facility's entire wastestream in the future).

[34] ERG. 2020. *Technologies for the Treatment of Flue Gas Desulfurization Wastewater* (DCN SE09218); ERG. 2020. *Notes from Call with DuPont* (DCN SE08618); Beijing Jingneng Power. 2017. *Beijing Jingneng Power Company, Ltd. Announcement on Unit No. 1 of the Hbei Shuoshou Jingyuan Thermal Power Co., Ltd. Passing Through the 168-hours Trial Operation.* November 13 (DCN SE08624); Broglio, R. 2019. *Vendor FGD Wastewater Treatment Details—Doosan.* July 15 (DCN SE07107); Lenntech. 2020. *Lenntech Water Treatment Solutions. Flue Gas Desulfurization Treatment* (DCN SE08622); Nanostone. 2019. *China Huadian Jiangsu Power Jurong Power Plant FGD Wastewater Zero Liquid Discharge Project was Awarded the Engineering Star Award.* June 27 (DCN SE08623).

[35] *Technologies for the Treatment of Flue Gas Desulfurization Wastewater, Coal Combustion Residual Leachate, and Pond Dewatering* (DCN SE11695).

[36] This information was also used as the basis for the 2015 rule NSPS for FGD wastewater.

[37] *Technologies for the Treatment of Flue Gas Desulfurization Wastewater, Coal Combustion Residual Leachate, and Pond Dewatering* (DCN SE11695).



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Furthermore, even looking at membrane filtration itself, as the EPA noted in the 2023 proposal, the foreign membrane filtration systems discussed in the 2020 rule have continued to successfully treat FGD wastewater and achieve zero discharge since 2020. Despite commenters arguing that this additional information is not important because it does not change the overall number of plants known to operate the technology or the number of influent and effluent concentration data points collected from these plants, the EPA finds that continued operations constitute significant new information. This is because the longer each zero-discharge system operates, the less probability that some yet unknown operational difficulty will appear and the more certainty the EPA has that the technology is capable of achieving long-term zero-discharge treatment of this wastewater. Thus, foreign installations of the suite of technologies forming the BAT basis support the EPA's conclusion that the BAT basis is available as that term is used in the CWA. At the same time, use of thermal evaporation systems abroad supports a finding that thermal evaporation systems are technologically available on their own, use of SDEs abroad supports a finding that SDEs are technologically available on their own, and use of membrane filtration systems abroad support a finding that membrane filtration is technologically available on its own.

With respect to pilot studies, the 2020 rule found that pilot projects on membrane filtration did not provide sufficient long-term concentration data on which to base a finding of availability or calculate limitations.[38] Commenters on the 2023 proposal reiterated the EPA's 2020 rule findings and suggested that the EPA had not supplemented the record with enough pilot studies to reach a new conclusion on availability. The EPA disagrees. The Agency first notes that the BAT technology basis in this final rule has been updated to consist of three zero-discharge systems. When the 13 thermal pilot projects and one SDE pilot project on FGD wastewater in the record are combined with the 30 membrane filtration pilots on FGD wastewater discussed in the proposed rule (including eight pilot studies conducted since the 2020 rule), the EPA has significant evidence of the ability of this suite of systems to handle a variety of operating conditions.[39] These domestic and foreign pilots have demonstrated success removing pollutants from FGD wastewater under a number of pretreatment settings, whether performed without chemical precipitation pretreatment, with chemical precipitation pretreatment, or following biological treatment.[40] Furthermore, while some systems will not generate a clean permeate or distillate that needs to be handled, those that do will recycle this clean water source back into the plant to meet the final zero-discharge limitations. Thus, long-term pollutant removal information is no longer as relevant as it was in 2020 because the EPA is not calculating nonzero limitations in this final rule. While this discussion of pilot projects is used to support the availability of the BAT technology basis comprised of multiple technologies, the large number of successful pilot projects of membrane filtration and thermal evaporation systems also supports the EPA's finding that these individual technologies are available on their own.

In comments, one recurring criticism of the 2023 proposal was that conclusions about membrane filtration system availability should not be drawn from foreign installations and pilot plants due to their small FGD wastewater flow rates. While the EPA acknowledges that foreign installations and pilot plants may have had smaller FGD wastewater flow rates than some of the plants the Agency expects would use this technology to meet the final limitations in this rule, this does not weigh against the EPA considering them as evidence of the technology's availability because the record shows that membrane filtration systems can be readily modified to handle different flow rates. This same comment was raised as far back as the 2015 rule with respect to thermal evaporation systems. At that time, the EPA responded to comments on the scalability of zero-discharge thermal evaporation systems:

> Additionally, even if the flow rates were smaller, the fact that the technology can treat the FGD wastewater demonstrates that the system is available, and the size of the system does not matter because the system design can be scaled and designed to accommodate different flow rates.[41]

The EPA has not received information since 2015 that suggests that technologies are no longer scalable to higher flows. With respect to membrane filtration scalability, in particular, the most common system design for operating membrane filtration technologies is to place modules of these systems in parallel and simply add more and more stacks to treat higher and higher flows. Therefore, the EPA concludes that use of zero-discharge systems in smaller flow rate pilots and full-scale foreign facilities supports the finding that the BAT technology basis is available; these uses also support the EPA's finding that each of the individual technologies forming the BAT technology basis are available on their own.[42]

*Application to other wastestreams.* While the record above is sufficient to determine that the BAT basis of several zero-discharge systems is available, use of the BAT basis on other wastewaters also supports the EPA's finding regarding its availability. In the 2020 rule, the EPA declined to find that membrane filtration treatment of non-FGD wastewaters was sufficient to support a finding of availability. In that rule, EPA's conclusions were based on the ways in which each non-FGD wastewater appeared different from FGD wastewater. The EPA first notes that the BAT basis includes three zero-discharge systems, not just membrane filtration. When considering the success with which this suite of zero-discharge systems has operated on non-FGD wastewater that has similar characteristics to FGD wastewater, the EPA views application of these systems to such non-FGD wastewater as supporting EPA's conclusion that the suite of zero-discharge technologies identified as BAT in this rule is in fact available.

Examining all three zero-discharge systems that constitute the basis for BAT, these systems are used in full-scale applications to other wastestreams in the steam electric power sector and other industrial sectors. The domestic steam electric power sector applies

[38] The EPA nevertheless established limitations based on membrane filtration technology in the 2020 VIP.

[39] One of the systems is a long-term pilot project at one facility, which is a commercial-scale system that may have sufficient capacity to treat the full FGD wastestream moving forward. Nevertheless, because the company is still making changes to the operation of the plant's FGD system, has also pilot tested a biological treatment system, and has continued to leave the possibility of biological treatment for compliance open, the EPA defers to the company's characterization of this system as a pilot, rather than a domestic, full-scale installation.

[40] In one case, a utility conducted a successful membrane pilot even when there were significant failures in the performance of upstream pretreatment systems leading to excessive TSS passthrough to the membrane system.

[41] U.S. EPA (Environmental Protection Agency). 2015. *Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category: EPA's Response to Public Comments.* Part 6 of 10. Page 6–40.

[42] It is also possible that some plants may choose to treat only a slipstream of FGD wastewater with a similarly small flow rate to keep the system closed loop.



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membrane filtration and thermal evaporation systems to EGU makeup water,[43] cooling tower blowdown,[44] and ash transport water.[45] Other industrial sectors with full-scale applications of membrane filtration, thermal evaporation, and SDE systems include the textiles,[46] chemical manufacturing,[47] mining,[48] agriculture,[49] oil and gas extraction,[50] food and beverage,[51] landfills,[52] and automotive industries.[53]

Information in the record indicates that there are many similarities between the FGD and the non-FGD wastestreams where zero-discharge systems have been used. In the 2020 rule record, the EPA discussed that cooling tower blowdown at steam electric power plants and desalination in oil and gas extraction were examples of where membrane filtration has been used in full-scale applications for treating high-TDS wastewaters (high-TDS being a characteristic of FGD wastewater); 85 FR 64664–64665. The 2020 rule record also established that mining wastewaters, which are high in gypsum scaling potential (another characteristic of FGD wastewater), have been successfully treated with membrane filtration applications. Finally, the 2020 rule record established that, despite the high variability in ash transport water (a third characteristic of FGD wastewater), it has been successfully treated with membrane filtration. This information indicates that membrane filtration can operate effectively on wastestreams that contain several characteristics of FGD wastewater, including high TDS, high gypsum scaling potential, and high variability.[54] The similarities of other wastewaters to FGD wastewater are also relevant when considering the successful treatment by thermal evaporation systems. Thermal evaporation systems have been used to treat mining wastewaters, oil and gas wastewaters, and landfill leachate. SDE systems have been used to treat landfill leachate. Thus, based on the information, the use of zero-discharge systems on other wastestreams supports the Agency's conclusion that the BAT basis of zero-discharge systems is available for FGD wastewater discharges. These uses also support the Agency's conclusion that membrane filtration, thermal evaporation systems, or SDE systems are each available on their own.

For all the foregoing reasons, the EPA finds that the BAT basis of zero-discharge systems is technologically available for the control of discharges in FGD wastewater. Steam electric power plants have used membrane filtration systems to achieve zero discharge of FGD wastewater internationally for years, and they have used traditional thermal evaporation systems[55] and SDEs[56] to achieve zero discharge of FGD wastewater domestically and internationally for years, as even recent electric utility reports acknowledge.[57] [58] [59] [60] The widespread use across a variety of configurations of zero-discharge systems, when supplemented with the successful domestic and international pilot tests and use of such systems on other wastewaters in many industries (including the steam electric power generating industry itself and including wastewaters with characteristics that are similar to the FGD wastestream), further supports EPA's conclusion that the suite of zero-discharge technologies identified as the BAT basis in this rule is available. While this is not necessary to support its prior availability determination, the EPA further finds that any one of the technologies making up the BAT basis for FGD wastewater is available as that term is used in the Act. For membrane filtration, availability is demonstrated through full-scale use of membrane filtration abroad and in pilot projects both domestically and abroad, as well as its application to other wastestreams. For thermal evaporation, availability is demonstrated through use of full-scale thermal evaporation systems domestically and abroad and pilot projects both domestic and abroad, as well as their application to other wastestreams. For SDE systems, availability is demonstrated through use of full-scale SDE systems domestically and abroad, as well as their use in at least one known pilot project and application to a non-FGD wastestream.

*Reliance interests in connection with 2020 BAT technologies.* Several commenters on the 2023 proposal criticized EPA for continuing to support implementation of the 2020 rule while simultaneously revising that rule with potentially more stringent limitations. These commenters stated that utilities relied upon materials announcing the Agency's decision to reconsider the 2020 rule and statements in the 2023 proposal which both confirmed that utilities should continue to implement the 2020 rule. Thus, in reliance, utilities claimed that they have continued to install compliant technologies and that such reliance should lead the EPA to a decision not to finalize more stringent BAT for these wastewaters. In the

[43] EPRI (Electric Power Research Institute). 2015. *State of Knowledge: Power Plant Wastewater Treatment—Membrane Technologies.* August. 3002002143.

[44] *See, e.g.,* Drake, M., Wise, S., Charan, N., Venkatadri, R. 2012. ZLD Treatment of Cooling Tower Blowdown with Membranes. *WaterWorld.* December 1. Available online at: *https://www.watertechonline.com/process-water/article/16211541/zld-treatment-of-cooling-tower-blowdown-with-membranes* (DCN SE09089); ERG. 2019. *Final Notes from Meeting with New Logic Research.* July 22. (DCN SE07231) ERG. 2019. *Final Aquatech Meeting Notes.* July 26 (DCN SE07389).

[45] *See, e.g., https://www.ge.com/in/sites/www.ge.com.in/files/GE_solves_ash%20pond_capacity_issue.pdf* (DCN SE09090).

[46] ERG. 2020. *Final Notes from Call with DuPont* (DCN SE08618).

[47] ERG. 2020. *Final Notes from Call with DuPont* (DCN SE08618); U.S. EPA (Environmental Protection Agency). 2022. *Notes from Vendor Call with Vacom on October 27, 2021.* November 14 (DCN SE10367).

[48] ERG. 2019. *Final Notes from Meeting with Pall Water.* March 5. EPA–HQ–OW–2009–0819–7613; Wolkersdorfer, C., et al. 2015. *Intelligent mine water treatment—recent international developments.* July 21 (DCN SE08581); U.S. EPA (Environmental Protection Agency). 2014. *Office of Superfund and Remediation and Technology Innovation. Reference Guide to Treatment Technologies for Mining-Influenced Water.* EPA 542–R–14–001. March (DCN SE08582); ERG. 2019. *Final Aquatech Meeting Notes.* July 26 (DCN SE07389); U.S. EPA (Environmental Protection Agency). 2022. *Notes from Vendor Call with Vacom on October 27, 2021.* November 14. (DCN SE10367).

[49] U.S. EPA (Environmental Protection Agency). 2022. *Notes from Meeting with BKT—April 9, 2021* (DCN SE10253).

[50] ERG. 2018. *Final Oasys Meeting Notes.* February 16 (DCN SE06915); ERG. 2019. *Final Aquatech Meeting Notes.* July 26 (DCN SE07389); ERG. 2019. *Final Veolia Meeting Notes.* August 30 (DCN SE07818); U.S. EPA (Environmental Protection Agency). 2022. *Notes from Vendor Call with Purestream on October 26, 2021.* November 14 (DCN SE10366); U.S. EPA (Environmental Protection Agency). 2022. *Notes from Vendor Call with Vacom on October 27, 2021.* November 14 (DCN SE10367).

[51] U.S. EPA (Environmental Protection Agency). 2022. *Notes from Meeting with BKT—April 9, 2021* (DCN SE10253).

[52] ERG. 2019. *Sanitized_Saltworks Vendor Meeting Notes—Final* (DCN SE07089); U.S. EPA (Environmental Protection Agency). 2022. *Notes from Vendor Call with Heartland on October 19, 2021.* September 26 (DCN SE10291).

[53] U.S. EPA (Environmental Protection Agency). 2022. *Notes from Meeting with ProChem—April 9, 2021* (DCN SE10254).

[54] Use of membrane filtration has since expanded into additional applications, treating wastewaters and industries beyond those where it was used at the time of the 2020 rule (*e.g.,* the food and beverage and automotive industries).

[55] The Italian thermal evaporation systems discussed first in the 2013 proposed rule have been in operation for over a decade.

[56] Spray dry absorbers, effectively the same technology as the SDE, have been in use for decades to capture the same pollutants present in FGD wastewater.

[57] ''Proven technology (considered BAT for new sources by EPA). 3+ U.S. installations and 6+ European installations by Aquatech'' (DCN SE07206).

[58] DCN SE10234.

[59] DCN SE09998.

[60] EPRI (Electric Power Research Institute). 2017. *Thermal Evaporation Technologies for Treating Power Plant Wastewater: A Review of Six Technologies.* 000000003002011665 (DCN SE06971).

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alternative, some commenters recommended that such facilities reliance on, and compliance with, the 2020 rule should lead the EPA to build in additional flexibility for any more stringent BAT. Suggested flexibilities focused on subcategorization or longer timeframes for cost recovery before installation of more stringent technologies.

The EPA agrees that such reliance interests should be considered.[61] The EPA disagrees, however, with commenters who suggested these interests mean the Agency must retain only the 2020 limitations in all cases. First, no NPDES permittee has certainty of its limitations beyond its five-year NPDES permit term, as reissued permits must incorporate any newly promulgated technology-based limitations as well as potentially more stringent limitations necessary to achieve water quality standards. *See* 40 CFR 122.44(a) and (d). The statute is designed for both technology-based and water quality-based effluent limitations to be revisited in each permit and, when necessary, revised consistent with these provisions and in light of the goal of ultimately eliminating pollutant discharges from point sources into WOTUS. *See* CWA section 101, 33 U.S.C. 1251.

Moreover, the EPA has included enough time for facilities to build in any reasonable reliance interest. As discussed in section VII.E of this preamble, the Agency is finalizing a ''no later than'' date for the new FGD wastewater BAT limitations of December 31, 2029. Having a ''no later than'' date approximately five-and-a-half years following promulgation allows facilities to rely on permitted limitations for the remainder of any permit existing as of the effective date of this final rule.

Third, the EPA has considered the arguments that facilities have unrecoverable costs, particularly for biological treatment systems that the final rule may render obsolete, by evaluating both the existing costs of the 2020 rule and the costs of this final rule together in the IPM analysis. As discussed in sections VII.F and VIII.C, the EPA uses IPM to analyze electric sector impacts.[62] IPM shows small impacts across the industry and leads the EPA to the conclusion that even the cumulative cost of the two technologies is economically achievable (this concept is explained in section VII.F of this preamble). Where more stringent technologies are available, are economically achievable, and have acceptable non-water quality environmental impacts as zero-discharge systems do here, the fact that facilities may have to spend more to supplement or replace existing treatment systems, even relatively new ones, is not a sufficient reason on its own to reject selection of the technology.

Lastly, to the extent that the facilities claiming to be most impacted by having to add treatment are those that will be permanently ceasing coal combustion by 2034, the EPA has created a new subcategory for these facilities that would allow them to continue to meet only the 2020 BAT limitations and thereby avoid recovering the costs of two treatment systems (*i.e.,* biological treatment and a zero-discharge system), each one designed to meet the requirements of the 2020 or 2024 rules, over the facility's short remaining useful life. EPA anticipates that approximately nine EGUs may be able to avail themselves of this subcategory with respect to FGD wastewater.[63]

*Economic achievability of zero-discharge systems.* The EPA finds that the costs of zero-discharge systems for control of FGD wastewater are economically achievable. The 2020 rule cited the increased cost of membrane filtration as compared to the selected technology basis as a reason for rejecting membrane filtration[64] but did not find that the costs of membrane filtration were not economically achievable at that time. The EPA also declined in the 2020 rule to establish BAT based on thermal evaporation systems, which the Agency stated were 2.4 times the costs of the 2020 BAT technology basis of chemical precipitation plus low-residence-time-reduction biological treatment and 1.04 times the cost of membrane filtration. The Agency said that these costs were unreasonably high, and it cited this finding, together with the costs that the industry was facing due to other EPA rules, to reject thermal technologies as not economically achievable.

After updating the cost analysis and IPM modeling for the final rule, the EPA finds that the costs of the BAT basis of zero-discharge systems for FGD wastewater are economically achievable for the industry, as discussed further below and in sections VII.F and VIII. Furthermore, the EPA notes that the estimates in IPM are conservative with respect to FGD wastewater. To the extent that costs would have been lower at six plants had the EPA used certain CBI costs for thermal evaporation systems in its primary cost analysis, the economic impacts modeled in IPM at these plants are overestimated.[65]

*Non-water quality environmental impacts of zero-discharge systems.* The EPA finds that the non-water quality environmental impacts of zero-discharge systems are acceptable.

The EPA proposed to find that the non-water quality environmental impacts of membrane filtration are acceptable. Specifically, the EPA proposed to reverse findings from the 2020 rule regarding FA use to encapsulate the brine generated by membrane filtration. The EPA also solicited comment on the non-water quality environmental impacts of other zero-discharge systems that might be used as a BAT technology basis.

Some commenters raised concerns relating to the non-water quality environmental impacts of zero-discharge systems. Specifically, commenters expressed concerns that the EPA had incorrectly evaluated FA availability because it did not use the most recent EIA data (which demonstrates that there is not enough FA available for brine encapsulation), did not use proper brine generation and encapsulation blending rates, and did not account for the costs of lost FA sales. Other commenters questioned the technological availability of one method of handling the solid waste generated from zero-discharge technologies—brine encapsulation—claiming that it has not been demonstrated to adequately retain pollutants in a landfill and, furthermore, that a particular form of brine encapsulation (paste encapsulation) has not been demonstrated and may not satisfy current disposal requirements. Finally, commenters claimed that pollutants in encapsulated brines and unencapsulated salt crystals could be

[61] The Supreme Court has held that, while an agency may change policies based upon a reasoned explanation, where a prior policy has engendered serious reliance interests, those interests must be taken into account. *FCC* v. *Fox Television Stations, Inc.,* 556 U.S. at 515 (citation omitted).

[62] While this modeling illustrates how the sector may comply with the rule, the EPA notes that the rule does not require any facilities to close.

[63] Additional EGUs are projected to participate in this subcategory for BA transport water and CRL as discussed in the sections below.

[64] While the relative costs of technologies differ from plant to plant, the 2020 rule acknowledged, and additional information obtained during the 2022 information collection confirms, that, in some cases, technologies such as membrane filtration may be less costly than biological treatment at individual plants even where, on average, they would be more expensive to the industry as a whole.

[65] To the extent that cost estimates for individual technologies are roughly of the same magnitude as indicated in the primary cost analysis, these costs would not be expected to alter the findings on economic achievability, even if the Agency were to rely on any one of the zero-discharge technologies as a standalone BAT basis.



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remobilized in a landfill setting or could damage the landfill-liner system. While some comments argued these disposal issues spoke to availability of the zero-discharge technology, the EPA views this rather as a non-water quality environmental impact (solid waste disposal issue) that it must consider. After considering these comments and the record, the EPA finds that the non-water quality environmental impacts of zero-discharge systems are acceptable.

With respect to comments on FA availability, the EPA agrees with commenters that it should evaluate the most recent EIA data, brine generation data, and data on encapsulation blends. Therefore, the EPA has updated its analysis to consider the most recent information in *2024 Steam Electric Supplemental Final Rule: Fly Ash Analysis* (DCN SE11692). As noted in that document, FA sold for beneficial use fluctuates from year-to-year, but over the last five years the amount sold would still be less than the amount available for sale even after assuming that every plant uses FA to encapsulate brine from an FGD wastewater and/or CRL treatment system. Thus, the EPA does not expect that under worst-case scenarios the use of FA to encapsulate brine would hamper the fly ash sales market, let alone constitute an unacceptable non-water quality environmental impact.

Furthermore, the assumption that all facilities use membrane filtration and generate a brine for encapsulation represents a conservative estimate on FA usage. The EPA has updated its cost estimates as discussed in section VIII and section 5 of the TDD. These revised cost estimates consist of least-cost analysis across the various zero-discharge systems. Part of this update also included adjustments to better account for the amount of FA available for encapsulation, brine generation rates, and brine encapsulation blends, all to respond to commenters and improve the accuracy of the Agency's analysis. The EPA finds that the now higher costs of membrane filtration lead thermal and SDE systems to be a less costly option at many plants. This finding is consistent with cost information received from some companies showing that membrane filtration would not be the least-cost technology. As a result of this analysis selecting non-membrane systems at a number of plants, the assumptions of FA usage presented above can be seen as a likely worst-case scenario. To the extent that FA sales would be even less hampered than the scenario already found to be acceptable above, it would only further support the Agency's conclusion that FA use in brine encapsulation has acceptable non-water quality environmental impacts. For a further discussion of EPA's revised cost estimates, see section 5 of the TDD.

With respect to comments about potential remobilization of pollutants from brine encapsulation and demonstration of paste encapsulation; as far back as the 2015 rule, the EPA pointed to multiple waste-handling alternatives that were being employed by facilities with zero-discharge systems. Some facilities at that time used the brine generated by thermal systems to condition ash for disposal. In the 2020 rule record, the EPA discussed facilities that directly engage in FA fixation of the FGD wastewater for this purpose, skipping the volume reduction step that a membrane or thermal system would offer (see section 4.1.5 of the 2020 TDD, DCN SE08650). When commenters express concern that contaminants from encapsulated brines could be remobilized, these comments assume less processing than EPA contemplates. The commenters reference situations where FGD wastewater or brine are merely used to condition ash without employing the further pozzolanic reactions that the EPA expects to occur in the full encapsulation process and that EPA included in its cost estimates of zero discharge. Encapsulation studies demonstrate that concentrations of leachate pass leachate toxicity tests and are of lower concentration than raw FGD wastewater. Encapsulation would also result in far less remobilization than exiting ash conditioning practices. Furthermore, to the extent that the EPA considered and discussed paste encapsulation, it was as a potentially cost-saving alternative to these conditioning and encapsulation techniques that are already well-demonstrated. Thus, to the extent that it is a less costly solid waste management alternative, it only provides the promise of cost savings compared to the EPA's estimates, but the EPA does not rely on this particular form of brine encapsulation in determining that solid waste disposal issues as a whole have acceptable non-water quality environmental impacts.

Even if brine encapsulation had not been adequately demonstrated as a solid waste handling practice, other solid waste handling alternatives are available. For example, facilities in the 2015 and 2020 rule records took the brine generated from a thermal system all the way down to a salt crystal using a crystallizer (DCN SE11695). The EPA evaluated these costs in the *FGD Wastewater, CRL, and Legacy Wastewater Zero Discharge Treatment Technologies Costs, Loadings, and Non-Water Quality Environmental Impacts* file (DCN SE11709) as an alternative and found it would increase annualized costs by three percent. These slightly higher overall costs would still be economically achievable.[66]

With respect to comments about remobilization of pollutants, the EPA agrees with commenters that pollutants in a landfill can be remobilized through percolation of rainwater through the disposed solid wastes. These solid wastes would include not only any encapsulated brines but also certain solids and salt crystals that would be disposed of following use of some thermal and SDE alternatives where no brine is generated. Here, absent the pozzolanic reactions from either ash conditioning or encapsulation, remobilization of pollution is more possible as rainfall percolates through these disposed solids. Nevertheless, proper landfill management is designed to reduce infiltration of water through a landfill and to capture leachate that makes it to the liner at the bottom of a landfill. The EPA received no comments that the facilities already generating these solids and salts have failed to properly operate their landfills such that contaminants were remobilized into the environment. Even where remobilization can reduce the overall effectiveness of the pollution treatment systems, as discussed in section VII.B.3 of this preamble, the EPA is also finalizing zero-discharge limitations for CRL during the life of the plant, unless they are discharges of unmanaged CRL.[67] This is designed to further ensure that these pollutants are kept in the landfill to the maximum extent possible rather than remobilized and released into the environment.

Many of the facilities presented in the record as having zero-discharge systems have also successfully disposed of conditioned ash or FGD solids in landfills for years. The record supports that a properly designed, installed, and maintained landfill can operate as intended. As the EPA learned during implementation of the CCR rule, many

[66] Facilities could also consider deep-well injection of their brine. The EPA found that these costs on a nationwide basis would be three times the costs of encapsulation, and so are unlikely to be pursued by most facilities, though this too would constitute an alternative disposal practice available for the management of brine.

[67] Note that the EPA is finalizing zero-discharge limitations for CRL, except as specified in the subcategories discussed in sections VII.C.4 and C.5. Where lined WMUs collect and treat CRL to zero-discharge standards during a facility's operation, permeate and distillate can be used to condition CCR for disposal in these WMUs.



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historical CCR landfills may suffer from the lack of an adequate liner system. However, the Agency has no evidence that, where liners are properly designed, installed, and maintained, they are incompatible with the additional pollutants in FGD wastewater that zero-discharge systems would capture.[68]

Finally, the EPA finds that, even to the extent that there are any negative non-water quality environmental impacts, the positive non-water quality environmental impacts outweigh the negative ones. In particular, the EPA estimates that there are significant decreases in air pollution and water withdrawals [69] as a result of this rule. While the rule is not being promulgated to reduce these impacts, these resulting non-water quality environmental impacts further support the Agency's conclusion that zero-discharge systems for FGD wastewater are BAT.

b. The EPA rejects less stringent technologies than zero-discharge systems as BAT for FGD wastewater.

Except for the new permanent cessation of coal combustion by 2034 subcategory discussed in section VII.C.4 of this preamble, and for discharges before the applicability dates of the new zero discharge-requirements in this final rule, the EPA is not selecting chemical precipitation followed by a low hydraulic residence time biological treatment including ultrafiltration, as the BAT technology basis. BAT is the ''gold standard'' for controlling water pollution from existing sources, and the Supreme Court has explained that BAT must achieve ''reasonable further progress'' toward the CWA's goal of eliminating pollution. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1003, 1006 (citing *Nat'l Crushed Stone* v. *EPA,* 449 U.S. 64, 75 (1980)). The record shows that the 2020 rule industrywide BAT technology basis for FGD wastewater removes fewer pollutants than the zero-discharge BAT technology basis identified in this final rule that has been found to be technologically available, be economically achievable and have acceptable non-water quality environmental impacts.[70] Similarly, except for the permanent cessation of coal combustion by 2028 subcategory discussed in section VII.C.3 of this preamble, the EPA is not identifying the less stringent (and previously rejected in the 2015 and 2020 rules) technologies of surface impoundments or chemical precipitation, as these technologies too will remove fewer pollutants than the BAT technology basis in this rule.

2. BA Transport Water

The EPA is identifying the zero-discharge systems of dry-handling or closed-loop systems as the technology basis for establishing BAT limitations to control pollutants discharged in BA transport water.[71] Specifically, dry-handling systems include both waterless air-cooled conveyor systems and pneumatic systems, as well as under-boiler mechanical drag systems (*e.g.,* submerged chain conveyors) and submerged grind conveyors (*e.g.,* compact submerged conveyors), which use quench water to cool the ash but immediately remove the ash without generating BA transport water. Closed-loop systems consist of remote mechanical drag systems that actively sluice the ash (*i.e.,* transport the ash with water) and are paired with any necessary storage tanks, chemical addition systems, and/or RO treatment necessary to fully recycle BA transport water except during high intensity, infrequent storm events as discussed below.[72] The EPA finds that these technologies are technologically available, are economically achievable, and have acceptable non-water quality environmental impacts after evaluating the factors specified in CWA section 304(b)(2)(B).

In the 2020 rule, the EPA rejected dry-handling or closed-loop systems as the BAT technology basis in favor of high-recycle-rate systems with a site-specific purge allowance of up to 10 percent of the BA transport water system's volume to address four potential purge needs.[73] The EPA justified this change in BAT due to process changes plants were making to comply with the CCR regulations, as well as the additional costs of dry-handling or closed-loop systems. In the 2023 proposal, the EPA reevaluated the four asserted purge needs relied upon in establishing the 2020 purge, and for each asserted purge need, the Agency explained why the record no longer supported that these purges should be part of the BAT technology basis. As a result, the EPA proposed returning to the dry-handling or closed-loop systems that served as the BAT technology basis in the 2015 rule.

The EPA received comments both supporting and criticizing the proposed return to the BAT basis of dry-handling or closed-loop systems selected in the 2015 rule. Comments supporting the EPA's proposal to return to the 2015 BAT technology basis for BA transport water focused on the lack of evidence in the record of facilities with a demonstrated need to purge BA transport water. These comments also focused on the legal standard that BAT represents the best performing plant, arguing further that the EPA has never disputed that the best performing plant can achieve zero discharge. Comments opposing the return to the 2015 rule standard reiterated the four potential purge needs discussed in the 2020 rule. In the alternative, these commenters asked the EPA to formulate flexibilities for purges that in practice might be more or less flexible than the site-specific 10 percent volumetric purge allowance arrived at in the 2020 rule.

Commenters also responded to the EPA's solicitation about the potential disparity between the purges from closed-loop systems and the purges from under-boiler ''dry'' handling systems that still use quench water. These comments asked EPA not to further regulate quench water from under-boiler systems because the water is not used to transport ash and these facilities had relied on the quench water from dry-handling systems being treated as a ''low volume waste source'' rather than BA transport water.

After considering all public comments and the EPA's extensive record in light of the statutory factors, and as explained below, the EPA finds that dry-handling or closed-loop systems are available and economically achievable, and that they have acceptable non-water quality environmental impacts. Therefore, the

[68] In contrast, FGD gypsum is already removed from FGD wastewater before discharge and is known to loosen clay soils which sometimes form the base of older landfills designed without composite liners.

[69] Reduced water withdrawals could also lead to reduced impingement and entrainment.

[70] In contrast, nothing in the record or public comments indicates that chemical precipitation plus low hydraulic residence time biological reduction has ceased to be available, be economically achievable, and have acceptable non-water quality environmental impacts for discharges before the applicability dates of the new, more stringent limitations of this rule.

[71] As described in section VII.B.5 of this preamble, the EPA is also finalizing a definitional change to certain wastewaters, including BA transport water, that excludes discharges necessary as a result of high intensity, infrequent storm events, as well as wastewater removed from ash handling equipment within the first 120 days of decommissioning the equipment.

[72] In addition to remote MDSs, non-BAT technologies include many dewatering bins (also known as hydrobins), and surface impoundments may also have the flexibility to operate as closed-loop systems. Like remote MDSs, the latter systems may need to install chemical addition systems (acid, caustic, and/or flocculants), RO systems, and/or additional storage tanks to operate as fully closed loop.

[73] The four asserted purge needs related to precipitation, maintenance, water chemistry, and water balance.

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EPA is selecting dry-handling or closed-loop systems as the BAT technology basis for BA transport water but is retaining the 2020 rule limitations for discharges before the applicability dates of the new zero-discharge requirement.

In the first subsection immediately below, the EPA discusses its rationale for selecting dry-handling or closed-loop systems as the BAT technology basis for BA transport water. In the following subsection, the EPA explains why it is not selecting less stringent technologies than dry-handling or closed-loop systems as the BAT technology basis for BA transport water. In the final subsection, the EPA discusses the definition of BA transport water and why, in light of the record, it declines to change how under-boiler ''dry'' systems with a discharge are regulated. For further discussion of the definitional changes to BA transport water that are being finalized with respect to high intensity, infrequent storm events, as well as decommissioning wastewater, see section VII.B.5 of this preamble. For further discussion of the EPA's retention of the 2020 rule limitations as interim limitations, see section VII.C.7 of this preamble.

a. The EPA selects dry-handling or closed-loop systems as BAT for BA transport water.

*Technological availability of dry-handling or closed-loop systems.* Based on the record, the EPA finds that dry-handling or closed-loop systems are technologically available. At the time of the 2020 rule, the EPA estimated that more than 75 percent of plants already employed dry-handling systems or wet-sluicing systems in a closed-loop manner, or they had announced plans to switch to such systems soon. Some of these systems have been in use since the 1970s, and today, most facilities have installed one or more such systems.[74] The high percentage of plants employing these systems indicates that they are technologically available.

In the 2015 and 2020 rule preambles, the EPA discussed the widespread use of dry-handling systems for control of BA transport water servicing about 200 EGUs at over 100 plants. In the 2020 rule, the EPA also discussed advances in dry BA handling systems. Specifically, the Agency discussed a newer technology called submerged grind conveyors (one example of which is called a compact submerged conveyor). At the time, compact submerged conveyors were known to be installed and in operation at two plants. The EPA has since learned that an additional plant has installed compact submerged conveyors.[75] [76] In addition to the increased use of compact submerged conveyors, a higher number and broader array of dry-handling systems are currently in place than the EPA originally forecasted. For example, as indicated in the 2020 rule record, one utility commented that it had space constraints at a facility that would preclude the installation of a compact submerged conveyor, and the EPA thus projected that this facility would employ a high recycle rate system under the 2020 rule. After the 2020 rule, however, that utility ultimately installed a different dry-handling system—which highlights the broad array of dry-handling options available for coal-fired power plants, regardless of their configuration. Even where space constraints may prohibit certain dry systems, a plant could use a pneumatic system, albeit at a somewhat greater cost. The 2020 rule record included information on 50 pneumatic installations from as early as 1992. Given that BAT is to reflect the best performing plant in the field, *Kennecott v. EPA,* 780 F.2d at 447, and that the facts in the record support the use of dry-handling technology to achieve zero discharge of BA transport water, it is likely the EPA could have selected dry-handling systems as the sole technology basis for control of BA transport water. Nonetheless, as it did in the 2015 rule, the EPA is also identifying closed-loop systems as a BAT technology basis for controlling discharges of BA transport water, given that a limited number of plants may find that option to be more attractive due to space constraints and lower costs when compared to a pneumatic system.

After the 2015 rule and during the 2020 rulemaking, certain industry representatives argued that there are challenges to operating a closed-loop BA handling system in a truly zero-discharge manner. They argued that closed-loop systems, including remote MDS and dewatering bins, cannot maintain fully closed-loop operations due to chemistry issues or water imbalances in the system, such as those that might occur from unexpected maintenance or large precipitation events. Even accounting for these issues, however, the 2020 rule did not find that closed-loop systems are not technologically available. Information in the EPA's 2020 rule record indicated that plants can operate their closed-loop systems to achieve zero discharge, although this could require some process changes and their resulting costs. Instead, the Agency rejected this technology as a basis for BAT based process changes happening at plants to comply with the CCR regulations (addressed further below), while also noting the additional costs over the 2015 rule's estimates. As explained below, the record indicates that closed-loop BAT handling systems are economically achievable. See section VIII of this preamble for a further discussion of costs associated with the closed-loop system technology basis.

In the 2020 rule, the EPA discussed four potential challenges with maintaining closed-loop systems: (1) managing non-BA transport water inflows, (2) managing precipitation-related inflows, (3) managing unexpected maintenance events, and (4) maintaining water system chemistry. The 2023 proposal discussed these issues at length, including why EPA did not view them as a basis for rejecting zero-discharge requirements. As explained in the proposal and further discussed below, based on the current record, the EPA continues to view none of these previously discussed challenges as providing a basis for rejecting closed-loop systems as not technologically available, although these issues may in certain circumstances require a plant to incur additional costs (which are found to be economically achievable) or to have an infrequent precipitation-related discharge (which would be addressed by the definitional changes the EPA is finalizing in this rule).

First, in 2020, the EPA stated that managing non-BA transport water inflows had the potential to result in water imbalances within a closed-loop system. In the 2023 proposal, the EPA found that closed-loop systems can be sized to handle additional wastestreams. The EPA received comments reiterating the 2020 rule findings; however, none of these comments provided specific data or information demonstrating that even one system cannot handle non-BA transport water inflows. Thus, EPA is maintaining its finding from proposal that a purge in response to water imbalance due to management of other wastestreams is not necessary.

Second, in 2020, EPA stated that managing precipitation-related inflows had the potential to result in water imbalances in the BA handling system. At proposal, EPA found that precipitation-related inflows can be

[74] One vendor estimates that only seven ash conversions remain in the entire industry.

[75] Some utilities have even suggested that the discussion of compact submerged conveyors in the final 2020 rule preamble and additional compliance timeframes have led them to consider these newer dry systems rather than a previously contemplated high-recycle-rate/closed-loop system.

[76] *Final Burns & McDonnell Meeting Notes* (DCN SE10248).



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adequately managed with design improvements, including the use of roofing where appropriate. The 2015 BAT technology basis and 2020 rule remote MDS technology designs included covers to avoid collecting precipitation, and the costs for covers were included in the associated cost analysis. The EPA received comments on the 2023 proposal reiterating the 2020 rule findings; however, none of these comments provided specific data or information demonstrating that even one system cannot handle common precipitation-related inflows.[77] To the extent that a plant experiences precipitation-related inflows as a result of a 10-year storm event of 24-hour or longer duration (*e.g.,* a 10-year, 30-day storm event), the EPA is finalizing a definitional change discussed in section VII.B.5 of this preamble.

The 2020 rule mentioned a third previously discussed challenge to operating a remote MDS as a closed-loop system: the possibility of infrequent maintenance events that might fall outside the 2015 rule exclusion of ''minor maintenance'' and ''leaks'' from the definition of BA transport water. EPRI[78] [79] listed several such maintenance events; most were expected to occur less than annually. EPRI provided information about the estimated frequency and volume of water associated with each maintenance event; however, EPRI did not provide information about a specific remote MDS unable to manage these maintenance events with existing maintenance tanks. In the 2023 proposal, the EPA found that maintenance could be managed within a closed-loop system. Furthermore, even where maintenance wastewater volumes are too large to be managed in existing maintenance tanks, utilities can, at additional cost, lease storage tanks for short-term maintenance where these infrequent maintenance events are foreseeable. Commenters did not provide any information on maintenance activities that would require a purge if facilities properly planned and executed regular operation and maintenance (O&M). Thus, the EPA is maintaining its finding from proposal that a purge of BA transport water for maintenance is not necessary.

The final engineering challenge discussed in the 2020 rule record with respect to closed-loop systems was the need to maintain water system chemistry. The 2020 rule discussed potentially problematic system chemistries, such as extreme acidic conditions, high scaling potential, and the buildup of fine particulates that could clog pumps and other equipment. The 2015 closed-loop system BAT design basis included a chemical addition system to manage these system chemistries, as does the BAT basis in this final rule. In particular, corrosivity can be managed through pH adjustment, scaling can be managed with acid and/or antiscalants, and fines can be further settled out with polymers and other coagulants. EPRI has documented that some systems have gone slightly further, pairing the chemical addition systems with changes in operations, such as higher flow rates or longer contact time. Some commenters on the 2023 proposal suggested that systems would not be able to manage these chemistry problems but did not provide information supporting this assertion. In the absence of information, the EPA finds that, even assuming that the previously mentioned strategies would not apply at a given plant, the same slipstream of purge allowed under the 2020 rule could be treated with RO and recycled back in as clean makeup water. The EPA has considered these additional costs as discussed in sections VII.F and VIII, and outside the additional cost (which is found to be economically achievable), there is no record evidence that this chemistry-related challenge cannot be overcome with reasonable steps. Therefore, this concern does not provide a basis for rejecting closed-loop systems as BAT.

For all the foregoing reasons, the EPA finds that the record indicates that dry-handling or closed-loop systems are technologically available for control of discharges in BA transport water.

*Economic achievability of dry-handling or closed-loop systems.* The EPA finds that the costs of dry-handling or closed-loop systems are economically achievable. In the 2020 rule, the EPA cited the costs of closed-loop systems as an additional basis for selecting high recycle rate systems. In the 2020 rule, the EPA noted that it had ''conservatively'' estimated costs of $63 million per year based on all facilities using a remote MDS needing a 10 percent purge to be treated with RO in order to achieve complete recycle (*i.e.,* zero discharge operations). The EPA never found, however, that the additional costs to achieve zero discharge were not economically achievable.

The EPA's updated cost estimates demonstrate that, after including the costs of treating all wastestreams—including achieving zero discharge for BA transport water—the final rule would result in minimal economic impacts. (For further information, see sections VII.F and VIII.) After considering these results, the EPA finds that these additional costs are economically achievable as that term is used in the CWA.

*Non-water quality environmental impacts of dry-handling or closed-loop systems.* The EPA finds that the non-water quality environmental impacts associated with dry-handling or closed-loop systems for controlling BA transport water discharges are acceptable. See sections VII.G and X below for more details.

*Process changes associated with dry-handling or closed-loop systems.* In the 2020 rule, the EPA also rejected dry handling or closed-loop systems due to process changes happening at steam electric facilities as they moved toward compliance with the CCR regulations. The EPA stated that, as plants close their surface impoundments under the CCR regulations, they may choose to send certain non-CCR wastewaters to their BA handling system. This was said to potentially complicate their efforts to fully close their BA handling systems due to increased scaling, corrosivity, or plugging of equipment. Alternatively, a closed-loop requirement might incentivize plants to discharge their non-CCR wastes rather than send them to their BA handling systems for control, in which case they would be subject to less stringent requirements governing low volume waste sources. The EPA also suggested that requiring limitations based on closed-loop systems could result in plants using their surface impoundments longer, assuming plants cannot build alternative storage capacity and need to continue to send their non-CCR wastes to unlined impoundments.

The rationale in the 2020 rule is no longer persuasive as a reason to select high recycle rate systems rather than dry-handling or closed-loop systems because the changes happening at plants under the CCR regulations are expected to be complete by the time the final BAT limitations apply to any given plant. In particular, the final rule BA transport water requirements will be included in NPDES permits with an applicability date of no later than December 31, 2029. This is over a decade after the

[77] In one comment, a utility suggested that it could not employ roofing at its plant without jeopardizing the necessary cooling of the BA, but this plant did not provide any data showing that it could not manage this heat transfer with standard heating, ventilation, and air conditioning (HVAC) equipment.

[78] EPRI, 2018. *Closed-Loop Bottom Ash Transport Water: Costs and Benefits to Managing Purges* (DCN SE06920).

[79] EPRI, 2016. *Guidance Document for Management of Closed-Loop Bottom Ash Handling Water in Compliance with the 2015 Effluent Limitations Guidelines* (DCN SE06963).



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promulgation of the 2015 CCR rule and eight years after even the revised CCR surface impoundment deadline of April 11, 2021, by which facilities were required to cease receipt of all wastes into their unlined CCR surface impoundment.[80] As of the publication of this rule, most facilities have already completed conversions of their leaking, unlined CCR surface impoundments under the CCR regulations, which means that they no longer rely on these unlined surface impoundments as part of their BA handling systems, but rather have installed systems to handle their BA transport water that do not rely on unlined CCR surface impoundments.[81]

Of the remaining unlined CCR surface impoundments that might exist following promulgation of this rule, those operating under the CCR Part A rule flexibility found in § 257.103(f)(2) must permanently cease coal combustion, and as discussed below, the EPA is retaining the subcategory for EGUs permanently ceasing coal combustion by 2028, which does not require zero discharge of BA transport water. For those unlined CCR surface impoundments that are not permanently ceasing coal combustion and are required to close for cause but where alternative capacity is technically infeasible, there is some flexibility under the CCR Part A rule allowing for a maximum timeframe of October 15, 2023, or October 15, 2024, for the surface impoundment to cease receipt of waste.[82] The 2023 and 2024 extended timeframes require EPA approval.[83] Even with these extensions, the majority of facilities will have ceased receipt of waste in its non-compliant surface impoundment and completed its conversion to a CCR regulation-compliant BA handling method (necessary to remain in operation) within a few months of the effective date of this rule. Since there are no looming deadlines and tight timeframes under the CCR regulations that would justify continued flexibility, facilities with high recycle rate systems are free to focus on transitioning those high recycle rate systems to closed-loop operations.[84] Because ash handling changes will no longer be compelled by the CCR regulations by the time this final rule is effective, the EPA concludes that there are no ''process change'' or non-water quality environmental impact reasons related to the CCR regulations that weigh against the EPA's decision to select dry-handling or closed-loop systems as the BAT basis for control of BA transport water discharges.

b. The EPA rejects less stringent technologies than dry-handling or closed-loop systems as BAT for BA transport water.

Except for the new subcategory for EGUs permanently ceasing coal combustion by December 31, 2034, and for discharges before the applicability dates for the new zero-discharge requirement of this rule, the EPA is not establishing BAT limitations based on high recycle rate systems. In the 2020 rule, the EPA reversed its decision from the 2015 rule and determined that dry-handling or closed-loop systems were not BAT. As a result, the EPA established a volumetric purge allowance (with a maximum of 10 percent of the system volume) to be determined on a case-by-case basis by the permitting authority, which required a permitting authority's BPJ analysis to determine any appropriate further control. As discussed above, the technological issues identified in the 2020 rule can be resolved, albeit at potentially additional costs, which the EPA finds are economically achievable. Furthermore, a dewatering bin or remote MDS with a purge removes fewer pollutants than the BAT basis of dry-handling or closed-loop systems, which the Agency finds is technologically available, economically achievable, and has acceptable non-water quality environmental impacts.[85] BAT is the ''gold standard'' for controlling water pollution from existing sources, and the Supreme Court has explained that BAT must achieve ''reasonable further progress'' toward the Act's goal of eliminating pollution. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1003, 1006 (citing *Nat'l Crushed Stone* v. *EPA,* 449 U.S. at 75). For these reasons, the EPA is not selecting high-rate-recycle systems as BAT.

Except for the subcategory for EGUs permanently ceasing coal combustion by December 31, 2028, the EPA is also not identifying the less stringent (and previously rejected in the 2015 and 2020 rules) technology of surface impoundments as the technology basis for BAT, as this technology would also remove fewer pollutants than the BAT basis of dry-handling or closed-loop systems, which the EPA finds is technologically available, is economically achievable, and has acceptable non-water quality environmental impacts.

c. The EPA continues to regulate discharges from some dry-handling BA systems as a low volume waste source.

As previously discussed, the final BAT technology basis for BA transport water is dry-handling or closed-loop systems. This technology basis incorporates systems that operate so as to not generate BA transport water at all (so-called ''dry'' systems), as well as systems that do generate BA transport water but recycle that transport water in a closed-loop manner so as to achieve no discharge (so-called ''wet'' systems). At proposal, EPA solicited comment on the issue of whether the final rule could create unintended consequences if discharges from a ''dry'' BA handling system are regulated differently than discharges from a ''wet'' BA handling system. Historically, discharges from a dry bottom ash handling system have not been considered transport water or BA purge water, but rather have been considered a ''low volume waste source,'' and therefore subject to their own limitations. These limitations include BPT limitations on TSS and oil and grease, as well as any more stringent BAT limitations that the permitting authority determines appropriate on a case-by-case basis using its BPJ.

In the proposal, the EPA pointed to one instance of a reported purge at an under-boiler dry-handling system that uses quench water to cool the BA but did not transport the ash with water and thus did not generate BA transport water. After soliciting comment on a number of potential modifications the Agency could make to address potential disparities between allowable purges from a wet BA handling system and a dry BA handling system, the EPA received only one comment that provided meaningful data relevant to the solicitations. Santee Cooper provided findings of a third-party analysis of the Cross facility's under-boiler dry BA handling system. Over the two years of 2021 and 2022, the BA system at Cross was fully drained 10 times and partially drained 29 times for maintenance. Historically, BA contact water such as that discharged at Cross has been treated as a low volume waste source.

[80] 40 CFR 257.101(a)(1).

[81] *See, e.g., https://www.epa.gov/coalash/coal-combustion-residuals-ccr-part-implementation.*

[82] 40 CFR 257.103(f)(1)(vi).

[83] Further information on the implementation of these Part A applications is available on EPA's website at: *https://www.epa.gov/coalash/coal-combustion-residuals-ccr-part-implementation.*

[84] Although the EPA estimates that fully closing the loop would be less expensive than converting to a dry-handling system, nothing would preclude a facility with a high recycle rate system from installing one of the technologically available and economically achievable dry-handling systems.

[85] In contrast, nothing in the record or public comments indicates that high-recycle-rate systems ceased to be available, be economically achievable, and have acceptable non-water quality environmental impacts for discharges before the applicability dates of the new, more stringent limitations of this rule.



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Based on public comments and a consideration of the record, the EPA is not modifying the regulations to address discharges that the EPA has historically not considered BA transport water. EPA did not receive any information to call into question its previous conclusions about the different characteristics of BA contact water and BA transport water, including the Agency's findings in 2015 and 2020 that BA contact water has lower pollutant concentrations than BA transport water. Moreover, no commenters provided information supporting a finding that the zero-discharge requirements in this rule could have the unintended effect of leading to more discharges of low volume waste from dry BA handling systems than would otherwise occur. Based on the limited information provided in comments, EPA concludes no changes to the regulatory treatment of purges from a dry BA handling systems are warranted, and they will continue to be regulated as low-volume wastes.[86]

Aside from the under-boiler BA handling systems (''dry-handling'' systems) that the EPA solicited comment on, some commenters also responded to EPA's solicitations by suggesting that purges from remote BA handling systems (''closed-loop'' systems) should continue to be allowed to avoid creating disparities between dry-handling and closed-loop systems.[87] Comments in this vein tended to be very generalized and did not provide any meaningful reason for EPA to change direction from its proposal, with the exception of the EPA's definitional change described in section VII.B.5 of this preamble.

3. CRL

Except for the subcategory for discharges of unmanaged CRL, the EPA is identifying zero-discharge systems as the technology basis for establishing BAT limitations to control pollutants discharged in CRL.[88] More specifically, as with FGD wastewater, the technology basis for CRL is membrane filtration systems, SDEs, and thermal evaporation systems alone, or in any combination, including any necessary pretreatment *e.g.,* chemical precipitation) or post-treatment (*e.g.,* crystallization).[89] Furthermore, where a permeate or distillate is generated from the final stage of treatment, the technology basis is a process wherein this water would then be recycled back into the plant as either FGD makeup water or EGU makeup water.[90] After evaluating the factors specified in CWA section 304(b)(2)(B), the record shows that these technologies are available, are economically achievable, and have acceptable non-water quality environmental impacts. For discussion of the subcategory for discharges of unmanaged CRL, see section VII.C.5.

Based on the BAT technology basis identified, the EPA is establishing zero-discharge limitations for CRL, as it does for FGD wastewater. However, because CRL is different from FGD wastewater in that it is expected to continue to be generated and discharged following even the retirement of the plant, the EPA is also using the BAT technology basis identified to establish nonzero numeric limitations following a plant's eventual retirement—limitations based on membrane filtration for CRL permeate and limitations based on thermal evaporation for CRL distillate.

In the subsection immediately below, the EPA discusses its rationale for establishing zero-discharge systems as BAT for control of CRL. In the following subsection, the EPA explains why it rejected less stringent technologies as BAT. In the final subsection, the EPA explains the rationale for establishing zero-discharge systems as NSPS for control of CRL. For further discussion of the new subcategories for permanent cessation of coal combustion by 2034 and discharges of unmanaged CRL, see section VII.C of this preamble. For further discussion of the definitional change to CRL that is being finalized with respect to high intensity, infrequent storm events, see section VII.B.5 of this preamble.

a. The EPA selects zero-discharge systems as BAT for CRL.

*Technological availability of zero-discharge systems.* Although the EPA's preferred option at proposal was to identify BAT based on chemical precipitation, it solicited comment on a zero-discharge requirement based on other technologies as well, including the same technologies identified as the BAT basis for control of FGD wastewater in this rule. 88 FR 18849. The EPA received comments both for and against the availability of zero-discharge systems. Commenters favoring zero discharge of CRL pointed to the EPA's record, which shows that one facility already employs a zero-discharge thermal evaporation system to co-treat its CRL and FGD wastewater, many non-CCR landfills use zero-discharge systems to treat their leachate, and zero-discharge systems have been used to treat other wastewaters similar to CRL, including FGD wastewater. In contrast, commenters opposed to zero-discharge systems claimed that the EPA did not sufficiently evaluate such systems at proposal and further disputed EPA's findings that pollutants in CRL are similar to those in FGD wastewater.

After consideration of the comments received and evaluation of the extensive record, the EPA finds that zero-discharge systems are technologically available for control of CRL discharges. BAT is supposed to reflect the highest performance in the industry and may reflect a higher level of performance than is currently being achieved based on technology transferred from a different subcategory or category, bench scale or pilot plant studies, or foreign plants. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1006; *Am. Paper Inst.* v. *Train,* 543 F.2d at 353; *Am. Frozen Food Inst.* v. *Train,* 539 F.2d at 132. The EPA disagrees with commenters who suggested the Agency had not sufficiently evaluated zero-discharge options at proposal and instead agrees with commenters that the best-performing plant treating CRL domestically in this industry is achieving zero discharge. At proposal, the EPA discussed a thermal evaporation system that has achieved zero discharge of CRL and FGD

[86] Furthermore, the EPA notes that the resulting average annual discharge of about 600,000 gallons per year of BA contact water at Cross results in small pollutant loadings in both relative and absolute terms. Contrast this to the three million gallons *per day* of BA transport water and the relative reduction in water volumes alone, not accounting for the lower pollutant concentrations of BA contact water, mean that the pollutant discharges are reduced by over 99.9 percent.

[87] For context, the requested purges from remote systems operating as high-recycle-rate rather than closed-loop systems are often in the range of 50,000 to 100,000 gallons *per day,* an amount far greater than the amounts of BA contact water (a low-volume waste source with fewer pollutants) discharged in the one dry-handling facility for which the EPA has information on purges.

[88] As described in section VII.B.5 of this preamble, the EPA is also finalizing a definitional change to certain wastewaters, including CRL, that excludes discharges necessary as a result of high intensity, infrequent storm events.

[89] While three main technologies are listed here and are used to evaluate costs and non-water quality environmental impacts, the list is not meant to exclude use of FA fixation, direct encapsulation, evaporation ponds, or other zero-discharge treatment options where a facility uses these technologies to meet the zero-discharge standard established in this rule.

[90] The 2020 rule finalized a carve out from the definition of FGD wastewater applicable to ''treated FGD wastewater permeate or distillate used as boiler makeup water.'' The EPA is making the equivalent change to the definition of CRL for the same reasons the change was made to the definition FGD wastewater and to support consistency across these two zero-discharge wastewater streams. *See* 85 FR 64675. No corresponding change is necessary for use to condition CCR destined for disposal where the disposal would be subject to the same zero-discharge limitations.



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wastewater since 2015.[91] [92] The record also includes two domestic pilot studies on CRL: one using membrane filtration and another using membrane filtration with SDE. Furthermore, the proposed rule record included information on treatment of non-CCR landfill leachate, including one thermal technology vendor with full-scale installations, one thermal technology vendor with a pilot study, and two installations of membrane filtration with SDE.[93] The successful use of these systems at non-CCR landfills is relevant to CRL because CRL contains the same pollutants as found in these landfills (*e.g.,* mercury, arsenic, selenium, nitrates), and indeed non-CCR landfills have potentially even more challenging characteristics that these systems are able to handle. In particular, these systems have proven able to successfully treat the same pollutants found in CRL, in addition to treating potentially more challenging organic pollutants and managing more challenging biological fouling agents found in non-CCR landfill leachate that are either absent from, or present in lower concentrations in, CRL. Since the absence of these pollutants and fouling agents make treatment simpler, these differences support the EPA's finding of technological availability.

Finally, since the record indicates that CRL is similar to FGD wastewater—which the record demonstrates can be effectively treated using zero-discharge systems—the EPA also independently relies on the record evidence discussed in section VII.B.1 of this preamble above and technology transfer from FGD wastewater to support its conclusion that zero-discharge systems are available for controlling CRL discharges. The EPA may rely on technology transfer to establish technology-based limitations such as those in this rule. *Am. Iron & Steel Inst.* v. *EPA,* 526 F.2d 1027, 1058, 1061, 1064 (3d Cir. 1975); *Weyerhaeuser Co.* v. *Costle,* 590 F.2d at 1054 n.70; *Reynolds Metals Co.* v. *EPA,* 760 F.2d at 562; *California & Hawaiian Sugar Co.* v. *EPA,* 553 F.2d at 287. In the 2015 rule record, EPA found that the pollutants of concern in CRL are the same pollutants that are present in, and in many cases are also pollutants of concern for, FGD wastewater, FA transport wastewater, BA transport water, and other CCR solids. This finding led the Agency to select chemical precipitation as the technology basis for the 2015 rule's NSPS and PSNS for CRL, based on technology transfer from the use of chemical precipitation on FGD wastewater.[94] This finding was never challenged. The EPA is basing the final rule CRL limitations on the same zero-discharge systems selected as BAT for treating FGD wastewater in this final rule. In contrast to comments that pollutants found in CRL are fundamentally different than those found in FGD wastewater, the EPA confirms its findings from the 2015 rule that CRL is characteristically like FGD wastewater. Even after accounting for additional data from 12 landfills gathered prior to the 2023 proposal, the EPA's analysis in the *CRL Analytical Data Evaluation—2024 Final Rule* (DCN SE11715) memorandum shows that CRL continues to have the same pollutants of concern in similar concentrations as other wastewaters, including FGD wastewater. Zero-discharge systems are available to treat this type of wastewater, and the limitations based on this technology would eliminate all arsenic, mercury, and other toxic pollutants from CRL discharges by the steam electric power generating industry. Moreover, just as the use of each individual technology within the BAT technology basis for FGD wastewater discussed in section VII.B.1 of this preamble supports the availability of each individual technology as BAT for that wastestream, based on technology transfer from FGD wastewater, the use of each individual technology is sufficient on its own to support the availability of a zero-discharge limitation for CRL.

At proposal, the EPA solicited comment on zero discharge limitations for CRL as well as transferring the 2015 NSPS or 2020 VIP nonzero numeric limitations for FGD wastewater. Some commenters claimed the need to discharge from a zero-discharge system after retirement. While EPA is requiring zero discharge of pollutants from CRL during active operations, this is based, in part, on the ability of active EGUs to use clean permeate or distillate resulting from CRL treatment either in an FGD absorber or as boiler makeup water. After the last EGU at a facility retires, it may become necessary for a facility to discharge the permeate or distillate from its zero-discharge treatment system. Thus, the EPA is transferring the BAT limitations from the 2020 VIP and 2015 NSPS to provide more flexibility to a plant post-retirement. Plants may discharge CRL permeate after retirement subject to the 2020 rule VIP limitations designed for permeate from a membrane filtration system. Alternatively, plants may discharge CRL distillate after retirement subject to the 2015 rule NSPS limitations designed for distillate from a thermal treatment system.[95]

*Economic achievability of zero-discharge systems.* The EPA finds that the costs of zero-discharge systems for control of CRL discharges are economically achievable. For further discussion of the economic analysis, see sections VII.F and VIII, below.

*Non-water quality environmental impacts of zero-discharge systems.* The EPA finds that the non-water quality environmental impacts associated with zero-discharge systems to control CRL discharges are acceptable. See discussion below in section VII.G and section X of this preamble.

b. The EPA rejects less stringent technologies than zero-discharge systems as BAT for CRL.

Except for the new subcategories for permanent cessation of coal combustion by 2034 and discharges of unmanaged CRL, discussed in sections VII.C.4 and VII.C.5 of this preamble, EPA is not selecting less stringent technologies than the zero-discharge systems discussed above. BAT is the ''gold standard'' for controlling water pollution from existing sources, and the Supreme Court has explained that BAT must achieve ''reasonable further progress'' toward the CWA's goal of eliminating pollution. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1003, 1006 (citing *Nat'l Crushed Stone* v. *EPA,* 449 U.S. at 75). The record shows that zero-discharge systems are available, are economically achievable, and have acceptable non-water quality environmental impacts. Therefore, with the exception of the new subcategory for permanent cessation of coal combustion by 2034, the EPA is not leaving BAT for determination on a case-by-case BPJ basis by the permitting authority. Similarly, except for the new subcategory for discharges of

[91] ERG. 2020. *Final Notes from Site Call with Duke Energy's Mayo Steam Station.* June 15 (DCN SE08964).

[92] The EPA notes that, while the utility employing this system filed comments on the proposed rule, it did not dispute in its comments that its system effectively operates zero discharge for CRL, nor did it dispute that zero discharge is technologically available for CRL.

[93] An additional three membrane filtration technology vendors successfully treat non-CCR landfill leachate, but the operators of these installations have so far chosen to discharge the clean permeate instead of operating with zero discharge.

[94] In establishing chemical precipitation as the basis for NSPS, the Agency stated that for combustion residual leachate, chemical precipitation is a well-demonstrated technology for removing metals and other pollutants from a variety of industrial wastewaters, including leachate from landfills not located at power plants. Chemical precipitation is also well demonstrated at steam electric power plants for treatment of FGD wastewater that contains the pollutants in combustion residual leachate (80 FR 67859).

[95] SDEs and thermal systems that do not generate a distillate would not require this flexibility.



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unmanaged CRL, the EPA is not identifying as BAT the less stringent technology of chemical precipitation, as this technology would remove fewer pollutants than the BAT basis in this final rule, which the EPA has found is available, is achievable, and has acceptable non-water quality environmental impacts. Finally, the EPA is also rejecting the less stringent technologies of surface impoundments and chemical precipitation followed by a low hydraulic residence time biological treatment, as these systems would also remove fewer pollutants than the BAT basis in this final rule, which the EPA has found meets the requisite statutory requirements.

c. The EPA selects zero-discharge systems as NSPS for CRL.

At proposal, the EPA solicited comments on the propriety of revising NSPS for CRL based on decisions made with respect to BAT for CRL.[96] The EPA did not receive any comments on its solicitation for updating NSPS for CRL. After considering all of the technologies described in this preamble and TDD section 7, and in light of the factors specified in CWA section 306, the EPA concludes that zero-discharge systems represent BADCT for CRL at steam electric power plants, and the final rule promulgates NSPS based on these systems. More specifically, the BADCT technology basis for CRL is membrane filtration systems, SDEs, and thermal evaporation systems alone, or in any combination, including any necessary pretreatment (*e.g.,* chemical precipitation) or post-treatment (*e.g.,* crystallization).[97] Furthermore, where a permeate or distillate is generated from the final stage of treatment, the technology basis is a process wherein this water would then be recycled back into the plant as either FGD makeup water or EGU makeup water.[98] The record indicates that the zero-discharge systems that serve as the basis for the final NSPS are well demonstrated. This is fully supported by the discussion of the availability of zero-discharge systems for identifying BAT, both as a whole and as stand-alone technologies, as described above in section VII.B.3 of this preamble. As discussed in the preceding BAT discussion, because CRL is expected to continue to be generated and discharged even after the retirement of the plant, the EPA is also using the BAT technology basis identified to establish nonzero numeric limitations following a plant's eventual retirement—limitations based on membrane filtration for CRL permeate and limitations based on thermal evaporation for CRL distillate.

The NSPS in the final rule poses no barrier to entry. This is due, first, to the fact that no new coal-fired power plants are expected to be built. As the EPA's *Power Sector Trends Technical Support Document* states:

> It is unlikely that new conventional coal-fired EGUs will come online in the US. The last year in which a new coal-fired EGU (greater than 25 MW) was completed was in 2014. There are no new announced plans to build new coal-fired EGUs.[99]

This is consistent with EIA data [100] and is due to the uncompetitive financial realities of coal-fired power. Existing coal is almost universally estimated to be more expensive than replacement capacity moving forward.[101] Since no new coal-fired power plants are expected, updating NSPS to the same zero-discharge systems as BAT is more of a safeguard to ensure a consistent regulation of CRL, even if it likely will never apply.

Second, the final NSPS poses no barrier to entry based on the EPA's assessment of the possible impacts of the final NSPS on new sources using a comparison of the incremental costs of the final rule to the costs of hypothetical new generating units. The EPA developed NSPS compliance costs for new sources using a methodology similar to the one used to develop compliance costs for existing sources. The EPA's estimates for compliance costs for new sources are based on the net difference in costs between (1) wastewater treatment system technologies that would likely have been implemented at new sources under the previously established regulatory requirements and (2) those that would likely be implemented under the final rule. The EPA estimated that the incremental compliance costs for a new generating unit (capital and O&M) represent about one percent of the annualized cost of building and operating a new 650 MW coal-fired plant,[102] with capital costs representing approximately one percent of the overnight construction costs, and annual O&M costs also representing one percent of the fuel and other O&M cost of operating a new plant.

Finally, the EPA analyzed the non-water quality environmental impacts and energy requirements associated with the final BAT limitations for CRL. Since there is nothing inherently different between an existing and new source, the EPA drew on the analyses for existing sources and determined that NSPS based on the final rule BAT technologies have acceptable non-water quality environmental impacts and energy requirements. For further discussion of the non-water quality environmental impacts evaluated for BAT, see sections VII.G and X.

The EPA did not retain chemical precipitation as the basis for NSPS for CRL because, under CWA section 306, NSPS reflect ''the greatest degree of effluent reduction . . . achievable.'' Zero-discharge systems are capable of eliminating all discharges associated with CRL, and they form the BAT technology basis used to establish limitations for existing sources of CRL discharges in this rule. Moreover, establishing NSPS for CRL based on zero-discharge systems does not add to the overall estimated cost of the rule because the EPA does not predict any new coal-fired generating units will be installed in the timeframe of the EPA's analyses.

4. Legacy Wastewater

Except for the subcategory for legacy wastewater discharged from surface impoundments commencing closure after July 8, 2024, the EPA is reserving BAT basis for legacy wastewater at this time and instead is continuing to reserve BAT limitations for case-by case determination by the permitting authority, using its BPJ. This potential case-by-case outcome was explicitly

[96] The EPA did not solicit comment on revising any other NSPS because the proposed BAT technology bases for FGD wastewater and BA transport water would be similar to the 2015 BADCT technology bases for these wastestreams. The final rule is consistent with the proposal in that way.

[97] While three main technologies are listed here and are used to evaluate costs and non-water quality environmental impacts, the list is not meant to exclude use of FA fixation, direct encapsulation, evaporation ponds, or other zero-discharge treatment options where a facility uses these technologies to meet the zero-discharge standard established in this rule.

[98] The 2020 rule finalized a carve out from the definition of FGD wastewater applicable to ''treated FGD wastewater permeate or distillate used as boiler makeup water.'' The EPA is making the equivalent change to the definition of CRL for the same reasons the change was made to the definition FGD wastewater and to support consistency across these two zero-discharge wastewater streams. *See* 85 FR 64675.

[99] Available online at: *https://www.epa.gov/system/files/documents/2023-05/Power%20Sector%20Trends%20TSD.pdf.*

[100] Available online at: *https://www.eia.gov/todayinenergy/detail.php?id=54559#.*

[101] Energy Innovation Policy & Technology LLC®. 2023. *Coal Cost Crossover 3.0: Local Renewables Plus Storage Create New Opportunities for Customer Savings and Community Reinvestment.* January. Available online at: *https://energyinnovation.org/wp-content/uploads/2023/01/Coal-Cost-Crossover-3.0.pdf.*

[102] Energy Information Administration. 2024. *Capital Cost and Performance Characteristics for Utility-Scale Electric Power Generating Technologies,* January 2024. Available online at *https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capital_cost_AEO2025.pdf.*



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identified by the Fifth Circuit Court of Appeals as an alternative the EPA should have considered in the 2015 rule. *Southwestern Elec. Power Company* v. *EPA,* 920 F.3d at 1021 (''[E]ven assuming a lack of data prevented the EPA from determining BAT for legacy wastewater, nothing required the agency simply to set impoundments as BAT. Instead, the EPA could have declined to set nationwide effluent guidelines for legacy wastewater and allowed BAT determinations to be made by each facility's permitting authority through the NPDES permitting process on a site-specific basis.'') (citations omitted).

In the 2015 rulemaking and subsequent litigation, petitioners argued that the EPA lacks authority to establish differentiated limitations for legacy wastewater, as compared to newly generated wastewater, because the text of the CWA does not contain specific distinctions based on when wastewater is produced. As explained in the 2015 rule and in briefs before the Fifth Circuit Court of Appeals, however, nothing in the statute requires the EPA to establish the same technology basis for each wastestream within a point source category when establishing limitations.[103] The CWA directs the EPA to take into account a variety of factors in establishing the best available technology economically achievable, including,'' ''process changes,'' ''non-water quality environmental impacts,'' and ''such other factors ats the Administrator deems appropriate.'' 33 U.S.C. 1314(b)(2)(B). As discussed further below, the rule's differentiated BAT limitations for legacy wastewater are based on the changes happening at plants under the CCR regulations in relation specifically to legacy wastewater, which by and large is contained in surface impoundments. The EPA's conclusion that it is appropriate to set different BAT limits for legacy wastewater based on the different way this wastewater is handled in response to the CCR regulations is within the Agency's broad discretion under the statute. *See Texas Oil & Gas Ass'n* v. *EPA,* 161 F.3d 923, 934 (5th Cir. 1998) (''EPA has significant discretion in deciding how much weight to accord each statutory factor under the CWA.'').

In contrast to the environmental group petitioners' arguments discussed above that legacy wastewater should be subject to the same limitations and standards as newly generated wastewater, some commenters on the 2023 proposed rule argued that the EPA lacks authority to establish BAT limitations on legacy wastewater *at all* since it was previously generated and ''treated'' under the prior ELGs. The CWA regulates discharges of pollutants, 33 U.S.C. 1311(a), and nothing in the CWA prohibits the EPA from applying discharge limitations to previously generated (and even ''treated'') wastewater. The Commenters' view would lead to results under the statute that Congress could not have intended. Under commenters' reading, if wastewater was treated to meet BPT regulations, it could not be treated any further to meet more stringent BAT regulations. This would be contrary to the CWA's technology-forcing scheme. In this case, the treatment referred to by the commenter is treatment using a surface impoundment. The Fifth Circuit has strongly suggested that, in light of the EPA's 2015 finding that surface impoundments are ''largely ineffective'' at removing dissolved metals, to achieve the BAT standard, something more than limitations based on surface impoundments should be required of legacy wastewater discharges. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1015, 1017.

While commenters claim that it is not fair for plants to be subject to new limitations for wastewater generated when the plant was making operational decisions under a prior ELG, as further discussed below, the EPA finds that it is economically achievable for certain plants to meet additional limitations on their legacy wastewater, as required for Best Available Technology Economically Achievable under the CWA. Moreover, the EPA has considered the unique situation in which some plants may have already closed and, therefore, lack an active revenue stream to pay for additional pollution controls. For the case-by-case legacy wastewater limitations discussed below, permitting authorities can consider the site-specific economic achievability of particular requirements when identifying BAT. For the legacy wastewater subcategory described in section VII.C.6 of this preamble, the BAT limitations are based on chemical precipitation. The EPA rejected more stringent limitations than those based on chemical precipitation, alone, in part because of the higher costs of more advanced treatment-based limitations, given that many legacy discharges may occur after a plant ceases operating.

The EPA also disagrees with commenters that plants could not have known they might be subject to more stringent limits for wastewater already generated. The CWA has always regulated discharges, and plants should have known that their discharges would potentially be subject to more stringent requirements, given that the CWA envisions progressively more stringent limits to meet progressively more stringent standards. *See Texas Oil & Gass Ass'n* v. *EPA,* 161 F.3d at 927; *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1006–07. Plants should have known that the limitations to which their discharges are subject might changes, as ELGs are established or revised, including to account for technological advancements. *See* CWA sections 301(d) and 304(b), 33 U.S.C. 1311(d) and 1314(b). Indeed, water quality concerns might require water quality-based effluent limitations that change over time as well.

In the first subsection immediately below, the EPA discusses its rationale for reserving BAT limitations to be derived on a BPJ-basis to control legacy wastewater. In the second subsection, EPA discusses why it is not selecting surface impoundments as BAT for legacy wastewater. In the final subsection, the EPA discusses why it is not selecting more stringent technologies as BAT for legacy wastewater, except for a subcategory of legacy wastewater discussed in section VII.C.6 of this preamble. For further discussion of the subcategory for legacy wastewater discharged from surface impoundments commencing closure after July 8, 2024, see section VII.C.6 of this preamble.

a. BPJ-based BAT Limitations Will Continue To Apply to Legacy Wastewater

The EPA is finalizing the approach proposed for this rule for legacy wastewater: permitting authorities will continue to develop BAT limitations on a case-by-case basis, using their BPJ. The EPA received comments supporting and opposed to the case-by-case approach. Commenters opposing this approach came from two perspectives. Some industry commenters believed that only BPT and water quality-based effluent limitations currently apply to legacy wastewater and that the EPA should finalize this approach. In contrast, other commenters viewed the proposed BPJ approach as impermissibly allowing permitting authorities to select surface impoundments as BAT. In the alternative, these commenters recommended that the EPA formally constrain the permitting authorities' discretion when determining BAT with a BPJ analysis. Commenters that supported the EPA's proposed approach

[103] This was a question the Fifth Circuit never reached because it vacated and remanded the 2015 legacy wastewater limitations on other grounds. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1015.



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opposed selecting more stringent technologies as BAT in large part because of the timelines for completing closure under the CCR regulations. Some commenters also stated that most or all legacy wastewater will have been discharged prior to the effective date of any final rule. Finally, commenters from multiple perspectives universally opposed certain definitional changes that the EPA solicited comment on at proposal, involving establishment of two new classes of legacy wastewaters called surface impoundment decant wastewater and surface impoundment dewatering wastewater. Their comments opposed the changes because of the unclear delineation between the two types of legacy wastewater and the view that all legacy wastewater should be regulated the same.

After considering the comments received and evaluating the record in light of the factors specified in CWA section 304(b)(2)(B), the EPA finds that no single technology is technologically available and economically achievable for control of pollutants in legacy wastewater, except for legacy wastewater from a subcategory of EGUs as discussed in section VII.C.6 of this preamble. Because of process changes happening at plants in the form of ongoing and soon-to-be-completed surface impoundment closures under the CCR regulations, the EPA finds that it is infeasible to finalize a nationwide BAT limitation for legacy wastewater mid-closure. The statute requires BAT to reflect what is technologically available, is economically achievable, and has acceptable non-water quality environmental impacts based on consideration of several factors, including ''process changes,'' ''non-water quality environmental impacts,'' and ''such other factors'' as the Administrator deems appropriate. Because many facilities with surface impoundments are in the process of closing their surface impoundments under the CCR regulations (regulations that create safeguards around the disposal of solid waste, as explained in section IV.E of this preamble), the technology that represents BAT for legacy wastewater treatment is likely to vary from site to site depending on several factors. These factors include, but are not limited to, the types of wastes and wastewaters present, the characteristics of the legacy wastewater in each layer of a surface impoundment, the amount of legacy wastewater remaining to be treated in a surface impoundment, the treatment already available on site, the treatment option costs, the extent to which CWA requirements could interfere with closure timeframes required under the CCR regulations, the potential for increased groundwater contamination, and the potential for increased discharges through groundwater that are determined to be the functional equivalent of direct discharges (FEDDs) to a WOTUS.

The effect of the EPA declining to identify a nationally applicable BAT for this wastewater is that permitting authorities will continue to establish site-specific technology-based effluent limitations using their BPJ.[104] Because the limitations under this rule are required to be derived on a site-specific basis, taking into account the requisite BAT statutory factors and applying them to the circumstances of a given plant, these case-by-case limitations would by definition be technologically available and economically achievable and have acceptable non-water quality environmental impacts, where the permitting record reflects that such is the case. While the dynamic and changing nature of this wastestream at this time means there is no typical site, given the CCR regulations' closure requirements, the EPA agrees with commenters that, were permitting authorities to choose surface impoundments as the BAT technology for a particular site using the same rationale that the EPA put forth in 2015, this would run afoul of the Fifth Circuit's decision that found selecting surface impoundments as BAT was arbitrary, capricious, and inconsistent with the ''technology-forcing mandate of the CWA.'' *Southwestern Elec. Power Company* v. *EPA,* 920 F.3d at 1017.

Factors the permitting authority must consider when establishing BPJ-based BAT effluent limitations for legacy wastewater are specified in section 304(b) of the CWA, 33 U.S.C. 1314(b), and 40 CFR 125.3(d). The EPA solicited comment on whether it should explicitly promulgate, in regulatory text, specific elements related to these factors for this steam electric wastewater. While some commenters advocated for further restrictions to deter or even prohibit permitting authorities from selecting surface impoundments as BAT through a BPJ analysis, the CWA and EPA regulations already require the permitting authority to evaluate whether more stringent technologies are available, are economically achievable, and have acceptable non-water quality environmental impacts. Moreover, given existing case law and information known about more advanced technologies, the EPA believes that a permitting authority which chooses to select surface impoundments as BAT would face substantial legal risk unless it could justify its decision based on the BAT statutory factors. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1018 n.20 (''EPA may have been uncertain about what the precise BAT for legacy wastewater should be, but the record fails to explain why impoundments are BAT, if that term is to have any meaning.'').

The EPA agrees with commenters that differentiating legacy wastewaters into two distinct classes in the manner the EPA solicited comment on at proposal (*i.e.,* decant and dewatering wastewaters) is unnecessary and not useful; therefore, the EPA is not finalizing new definitions to distinguish classes of legacy wastewater. The proposal would have potentially doubled the number of BPJ analyses performed by permitting authorities—as there would have been two classes of legacy wastewater that each required BPJ determinations—without likely changing the ultimate outcome of treatment of the legacy wastewater as a whole. Moreover, it is doubtful that creating two new definitions of legacy would be useful given that, where a surface impoundment is already closing under the CCR regulations, both types of wastewater would likely be discharged before a new CWA permit incorporating the limitations in this final rule would take effect. Lastly, given the confusion commenters expressed over how to interpret the definitions, the EPA is concerned that finalizing these definitions would complicate implementation.

The EPA also agrees with commenters that the vast majority of legacy wastewater likely has been, or will be, discharged pursuant to BPJ determinations under existing permits. Rapid closure of many of these surface impoundments is ongoing under the CCR regulations. The EPA notes that most surface impoundments had to cease receipt of waste by April 11, 2021, and commenced closure soon after. These surface impoundments were either unlined, in violation of location restrictions, or both. The EPA estimates that 398 of 507 such surface impoundments are less than 40 acres and thus must close within seven years of commencing closure (five years plus

[104] Because some commenters took issue with the EPA's statements in the proposed rule that, under the prior regulations in effect, BAT limitations based on a permitting authority's BPJ are appropriate for legacy wastewater, the Agency is explicitly reserving BAT limitations for legacy wastewaters in the regulatory provisions setting forth BAT requirements for FGD wastewater, BA transport water, FA transport water, and flue gas mercury control wastewater to avoid any ambiguity regarding whether BPJ applies.



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a possible two-year extension).[105] The remaining 109 are over 40 acres and thus can receive additional two-year extensions. Even with the possibility of extensions, dewatering is one of the first steps of closure and, therefore, most of the 507 surface impoundments which have already begun the closure process will have completed dewatering before permitting authorities issue NPDES permits implementing this final ELG rule.

Moreover, as is the case for all promulgated effluent limitations guidelines, the requirements for direct dischargers [106] in this rule do not become applicable to a given discharger until they are contained in revised NPDES permits. NPDES permits are typically issued for the maximum allowed five-year permit term. Most permits are not immediately revised after the EPA issues a new ELG rule, rather permitting authorities incorporate the new ELG rule limitations at the time the next five-year permit is up for reissuance. In addition, it is not uncommon for permits to be administratively continued beyond the five-year permit term if a permittee submits a timely permit renewal application, in which case the existing permit stays in effect until a new permit is effective. *See* 40 CFR 122.6. Thus, even if these new ELG requirements were implemented into NPDES permits in a timely manner following their effective date on July 8, 2024, the vast majority of legacy wastewater would have been discharged or will be discharged pursuant to BPJ determinations in existing permits rather than pursuant to any regulations the EPA might promulgate. Much, if not all, of the remaining legacy wastewater is included in the 19 surface impoundments expected to be covered by the subcategory for legacy wastewater discharged from surface impoundments commencing closure after July 8, 2024. This subcategory is further described in section VII.C.6 of this preamble.

Reserving BAT limitations for this legacy wastewater to be developed by the permitting authority on a BPJ-basis would allow permitting authorities, on a case-by-case basis, to impose more stringent limitations (including potentially zero-discharge limitations) based on technologies that remove more pollutants than the previously promulgated BPT limitations based on surface impoundments, depending on what is technologically available and economically achievable for individual facilities. In this way, the final rule does not ''freeze impoundments in place as BAT for legacy wastewater,'' a criticism of the 2015 rule's legacy wastewater limitations by the Fifth Circuit, which acknowledged that BAT has in inbuilt 'reasonable further progress' standard and that 'BPT serves as the prior standard with respect to BAT.' *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1017 (citation omitted). Moreover, this final rule record includes information about technologies beyond surface impoundments and their application to legacy wastewater that could be useful to permitting authorities in making their determinations.

b. The EPA rejects surface impoundments as BAT for legacy wastewater.

The EPA is not selecting surface impoundments as the BAT basis for controlling discharges of legacy wastewater because there are more effective technologies for controlling discharges that some plants could use. Several plants described in the record employ technologies ranging from chemical precipitation to zero-discharge systems for legacy wastewaters. The previously promulgated BPT limitations are based on surface impoundments. As the Fifth Circuit has acknowledged, BPT is merely the first step toward the CWA's pollution reduction goals and provides the ''prior standard'' against which the stricter BAT is to be measured. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1006 (citing *Nat'l Crushed Stone,* 449 U.S. at 69, 77 & n.14). Therefore, the EPA is retaining the current case-by-case BAT approach rather than selecting surface impoundments.

c. The EPA rejects specific, across-the-board technologies more stringent than surface impoundments as BAT for legacy wastewater.

The EPA is not selecting more stringent, one-size-fits-all technologies, such as chemical precipitation, biological treatment, membrane filtration, thermal evaporation, and/or spray dryer evaporation as the BAT basis for controlling discharges of legacy wastewater, except for the legacy wastewater described in section VII.C.6 of this preamble. As explained previously, many plants with legacy wastewater have already begun closure of their surface impoundments under the CCR regulations. These plants are in different stages of the dewatering process, as they are trying to meet their closure deadlines under the CCR regulations. Requiring limitations based on a more stringent BAT technology basis at all plants that are in the process of dewatering when their permit is renewed but before closure is complete would jeopardize their ability to meet their closure deadlines under the CCR regulations. This is because having to consider and add one or more treatment components would slow the dewatering process, at some plants more than others. If plants could not meet their closure deadlines under the CCR regulations, this would be an unacceptable non-water quality environmental impact.

Furthermore, some zero-discharge technologies are not available to plants after they cease coal combustion, even if the discharge of legacy wastewater will occur after that date. For example, while Boswell Energy Center has installed and is operating an SDE for treating several wastewaters including legacy wastewater, this SDE would not be available to a facility that no longer produces power because it is designed and operated using a slipstream of the hot flue gas to evaporate the wastewater, a heat source no longer available after retirement.

Although the EPA cannot determine that a particular technology is available within the meaning of CWA section 304(b) to treat the legacy wastewater described in this section, the Agency could expect the permitting authority to select more stringent technologies than surface impoundments on a site-specific basis. In some cases, the stage of closure and realities on site may point to use of a more stringent technology. For example, a facility in early closure stages may be able to lease commercial, off-the-shelf equipment to treat its legacy wastewater. Alternatively, permitting authorities could assess the technologies a plant already uses for treatment of other wastewaters and determine that the legacy wastewater could be readily directed to an existing treatment system.

5. Definitional Changes

The EPA is finalizing two definitional changes. The first definitional change applies to high intensity, infrequent storm events as described in subsection (a), below. The second definitional change applies to decommissioning wastewater from FGD wastewater treatment equipment and ash handling equipment as discussed in subsection (b), below.

a. Definitional Change for High-Intensity, Infrequent Storm Events

The EPA is finalizing a definitional change for all the wastewaters for which the Agency is establishing zero-

[105] *See* 40 CFR 257.102(f).

[106] Indirect dischargers (those who discharge to POTWs) are subject to pretreatment standards that are directly implemented and enforceable. *See* CWA section 307, 33 U.S.C. 1317; 40 CFR part 403.

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discharge limitations in this final rule: FGD wastewater, BA transport water, and CRL. Specifically, the EPA is excluding from the definitions of these wastewaters any discharges which are necessary (*i.e.,* cannot be managed with existing systems or practices) as the result of high-intensity, infrequent storm events exceeding a 10-year storm event of 24-hour or longer duration (*e.g.,* a 10-year, 30-day storm event). The EPA is specifically selecting this duration storm event as this is a consistent duration storm event to the storm event described in 40 CFR part 423 with respect to regulation of coal pile runoff.[107] Due to these definitional exclusions, such discharges would not be subject to the zero-discharge requirements that otherwise apply to FGD wastewater, BA transport water, and CRL under this final rule. Instead, these discharges would be considered a ''low volume waste source'' and the TSS and oil and grease BPT limitations for such waste would apply, as well as any BAT limitations for the low volume waste source developed by a permitting authority using its BPJ. As discussed in section XIV.C.4 of this preamble, the EPA is also finalizing reporting and recordkeeping requirements that facilities must comply with when they discharge during these high intensity, infrequent storm events, which are intended to demonstrate that the discharge is necessary and to provide information about the time, place, and volume of the necessary discharge. Each of the wastestreams subject to this definitional change is discussed in turn below.

At the outset, the EPA notes that stormwater is not FGD wastewater, BA transport water, or CRL, though it may mix with these wastewaters. Instead, the EPA describes stormwater on its website as follows:

> Stormwater runoff is generated from rain and snowmelt events that flow over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground. The runoff picks up pollutants like trash, chemicals, oils, and dirt/sediment that can harm our rivers, streams, lakes, and coastal waters. To protect these resources, communities, construction companies, industries, and others, use stormwater controls, known as best management practices (BMPs). These BMPs filter out pollutants and/or prevent pollution by controlling it at its source.[108]

Since stormwater picks up different pollutants, for example dirt, it has inherently different characteristics from the wastewaters regulated in this final rule. Furthermore, larger storm events result in a higher fraction of stormwater and stormwater pollutants as compared to the pollutants in FGD wastewater, BA transport water, and CRL. Taken together, this means that during these high intensity, infrequent storm events, a requirement to treat to zero discharge would essentially be requiring higher and higher amounts of stormwater treatment, rather than treatment of the pollutants of concern in these three wastewaters.

Based on the CWA statutory factors of ''process employed,'' ''engineering aspects'' of control techniques, and non-water quality environmental impacts, the EPA concludes that a zero-discharge requirement for discharges of CRL, FGD wastewater, and BA transport water that cannot be managed with existing systems or practices during a high-intensity, infrequent storm event is not warranted. The CWA statutory factor of ''cost'' provides additional support for EPA's decision. Regarding CRL, the EPA solicited comment on the potential to exclude discharges from the definition of CRL to account for specific storm events. Several commenters expressed concerns that CRL collection systems in general, or at specific facilities, collected both CRL and stormwater. In such cases, segregation of the CRL and stormwater may not be possible for treatment. One specific design of concern to these commenters, although not the only problematic one, employs a chimney system to channel stormwater vertically through a landfill in order to minimize contact with the ash, and thus minimize the generation of CRL in the first place. In some cases, this design is used voluntarily as a BMP to reduce the potential for groundwater contamination; in other cases, commenters pointed out that such a design is required by state law. The EPA agrees that minimizing the formation of CRL promotes the goals of both RCRA and the CWA by reducing the pollutants mobilized into CRL that can potentially migrate into groundwater, be discharged into surface water, or both. It would be impracticable (and in some cases may also violate state law) for a facility with such a landfill design to rip out these chimney structures in order to segregate CRL from stormwater, but more importantly it would result in the mobilization of more pollutants into CRL (because more water would percolate through the CCR), not less.

Alternatively, it may be possible to design larger treatment systems that can handle even the additional flows resulting from the high intensity, infrequent storm events specified in the definitional change described above. However, here too the record does not support zero-discharge systems as BAT to control necessary discharges of CRL during the storm events described. First, the rainfall that reached the collection system via the chimneys would either be pristine rainfall or rainfall contaminated by runoff sediment, and thus would not be CRL. Second, CRL generated by the rainfall that does percolate through the landfill would not reach the leachate collection system at the same time as the rainfall that passes immediately through the chimneys. Depending on the infiltration rate and depth of the CCR, it may take hours, days, weeks, or longer for the additional CRL generated by the rainfall to ultimately pass through the layers of CCR and into the leachate collection system below. Until the leachate from the storm event migrates to the leachate collection system, the treatment system could be treating mostly or entirely non-CRL stormwater.

The EPA concludes that the considerations discussed above are sufficient to support its decision to exclude necessary discharges of CRL during high intensity, infrequent storm events from the definition of CRL and, thus, from the zero-discharge requirement that would otherwise apply to CRL. The EPA also notes that cost is a statutory factor that it must consider when establishing BAT, and that treatment of the higher flows comprised of primarily non-CRL during such high intensity, infrequent storm events would be more costly. EPA examined the data in the National Oceanic and Atmospheric Administration's *Precipitation Frequency Data Server*.[109] The amount of precipitation for a storm event in the 10-year to 25-year storm event range will be approximately double that of a 1-year storm event. It approximately doubles yet again for something even more extreme such as a 1,000-year storm event. Thus, were the EPA not to finalize a definitional change related to high-intensity, infrequent storm events, a facility would be forced to construct a system at least double the size, but potentially much larger, in order to manage volumes from these low-probability of occurrence

[107] 40 CFR 423.12(b)(10) (BPT limitations) and 423.15(a)(12) and (b)(12) (NSPS) provide, ''Any untreated overflow from facilities designed, constructed, and operated to treat the volume of coal pile runoff which is associated with a 10, year, 24 hour rainfall event shall not be subject to'' the TSS limitations or standards that otherwise apply to discharges of coal pile runoff.

[108] Available online at: *https://www.epa.gov/npdes/npdes-stormwater-program.*

[109] Available online at: *https://hdsc.nws.noaa.gov/pfds/.*



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precipitation events. As a result, costs could at least double.[110] The doubling of costs to have a system available to manage volumes from these low-probability events occurring once every 25 or 200 years would be a wholly disproportionate *costs per day in use* when compared to the costs actually considered in the EPA's cost estimates, costs that already treat the average annual flows of CRL under the more common storm events to zero discharge approximately nine years and 364 days out of every 10 years.[111] The EPA views the high cost of treating CRL discharges that cannot be managed by an existing zero-discharge system or practices during a high intensity, infrequent storm event as an additional factor supporting the EPA's decision to exclude such discharges from the definition of CRL.

The definitional change discussed for CRL is also appropriate for FGD wastewater. The EPA solicited comment on a zero-discharge requirement for discharges of FGD wastewater, including the availability of zero-discharge systems and ability of plants to meet zero-discharge limitations. The EPA received one comment suggesting that a zero-discharge requirement for FGD wastewater could force an offline plant to operate its coal-fired boilers for the sole purpose of recycling the excess water generated in its FGD treatment system during a storm event. The EPA acknowledges that some FGD treatment systems include open-air tanks and a few include lined surface impoundment pretreatment to increase physical settling. In these scenarios, it is possible that stormwater will increase the need to recycle the clean permeate or distillate from a zero-discharge system at a time when the plant is offline.[112] This scenario does raise concerns that there might be limited instances in which a discharge is necessary or otherwise might result in a plant running when it is not needed. This could result in unnecessary air emissions, a non-water quality environmental impact that the EPA is required to consider.

The EPA also notes that several facilities already co-treat FGD wastewater and CRL.[113] Nothing in this final rule would prohibit facilities from achieving zero discharge of these two wastewaters with a single system. Therefore, the EPA expects that, where there are economies of scale, facilities may elect to co-treat these wastewaters. While nothing in the final rule would prohibit such co-treatment, not finalizing a stormwater flexibility for FGD wastewater where such flexibility exists for CRL, and a discharge is necessary for the co-treated CRL, could make such co-treatment impracticable. Furthermore, just as with CRL, discharges during high intensity, infrequent storm events would consist primarily of rainfall and runoff rather than of FGD wastewater. For the reasons above, the EPA finds that zero-discharge systems are not BAT for discharges of FGD wastewater that cannot be managed with existing systems or practices during these high intensity, infrequent storm events.

Finally, the definitional change discussed above for CRL and FGD wastewater is appropriate for BA transport water as well. The EPA solicited comment on the potential need for purges from a closed-loop BA handling system, including purges related to precipitation events, which were a basis for including a purge allowance in the 2020 rule. The EPA's record shows that remote MDS systems can install roofing to mitigate the need to discharge during storm events, and this feature is included in the Agency's cost estimate. One commenter provided information about the necessary cooling received from its open air remote MDS and suggested that it may need to install expensive heat exchangers to make up for the lost cooling once a roof is installed. The EPA agrees that cooling BA (a waste so hot that is sometimes generated in molten form) is one of the primary functions of a BA handling system. While this comment did not provide data showing that cooling would fall enough to jeopardize the ability to recycle wastewater, to the extent that roofing could affect the ability of a remote MDS to return water cool enough to quench BA,[114] the EPA would agree that this could jeopardize the ability of that system to attain zero discharge during high intensity, infrequent storm events.

The EPA also acknowledges that some BA handling systems must recycle some BA into their FGD wastewater treatment systems either by design or to manage the volume of water or chemistry of water in the closed-loop system. For the reasons stated above finding that a definitional change is warranted for FGD wastewater, it would also make sense to have a definitional change for BA transport water, especially to the extent that the BA transport water in closed-loop systems is used as FGD makeup water to comply with the zero discharge-requirements. For the reasons above, the EPA finds that zero-discharge systems are not BAT for BA transport water discharges that cannot be managed with existing systems or practices during high intensity, infrequent storm events.

While the previous considerations are sufficient to support the Agency's decision to exclude necessary discharges of BA transport water during high intensity, infrequent storm events from the definition of BA transport water and, thus, from the zero-discharge requirement that would otherwise apply to BA transport water, the EPA notes that the statutory factor of cost also supports the EPA's decision. Remote MDS systems are not the only systems that the EPA estimates will operate as closed-loop systems. At some facilities, larger settling systems such as concrete basins have already been constructed. In contrast to MDS systems, the EPA acknowledges that its cost estimates assume that some non-MDS wet systems (*e.g.,* dewatering bins, lined surface impoundments, basins) would make low-cost changes to recirculate BA transport water rather than install a new BA handing system. A roof or other cover over surface impoundments or basins that could be acres in size would be cost prohibitive at such sites.

In summary, after considering public comments and the facts and analyses in the record, and in light of the requirements for the EPA to consider several statutory factors (including the process employed at the facility, the engineering aspects of the application of various types of control techniques, and

[110] Volume is one of the primary inputs to the EPA's cost models of zero-discharge systems. The relationships are not linear, but costs do increase at a similar enough rate for purposes of the illustrative argument above. For more information on the specific cost estimates the EPA used, see section 5 of the TDD.

[111] Furthermore, doubling the costs of these systems would not be justified as the CRL, and thus the pollutants in CRL, would not reach the leachate collection system until much later. Instead, this larger system would be underutilized for years or decades at a time, only to treat a wastestream composed of mostly non-CRL wastewater on the infrequent occasion that it was ultimately called upon just for the sake of saying that the system eliminated all CRL discharges. Courts have recognized that while CWA section 301 is intended to help achieve the national goal of eliminating the discharge of all pollutants, at some point the technology-based approach has its limitations. *See Am. Petroleum Inst.* v. *EPA,* 787 F.2d 965, 972 (5th Cir. 1986) (''EPA would disserve its mandate were it to tilt at windmills by imposing BAT limitations which removed de minimis amounts of polluting agents from our nation's waters . . . .'').

[112] Recall that recycling of the permeate or distillate into the FGD system or the boiler is part of the zero-discharge system technology basis.

[113] Other commenters that do not yet have co-treatment also suggested that co-treatment be allowed.

[114] The commenter stated that its facility needed water below 140 degrees Fahrenheit in order to sufficiently cool its BA.



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non-water quality environmental impacts) the EPA rejects zero-discharge systems as BAT to control necessary discharges of FGD wastewater, BA transport water and CRL mixed with stormwater during high intensity, infrequent storm events exceeding a 10-year storm event of 24-hour or longer duration (*e.g.,* a 30-day storm event). The EPA's decision is further supported after considering the associated costs. While the EPA is excluding necessary discharges resulting from such storm events from the definitions of CRL, FGD wastewater, and BA transport water, this does not mean that no limitations apply to these discharges. As low volume waste sources (which are defined in 40 CFR part 423 as wastewater from all sources except those for which specific limitations or standards are otherwise established in this part), these discharges are subject to the BPT limitations for low volume waste sources as well as any BAT limitations developed by the permitting authority on a BPJ basis.

Furthermore, the EPA notes that facilities would still be required to follow any stormwater requirements. High-intensity, infrequent storm events are currently addressed in the *2021 Multi-Sector General Permit* (MSGP), the most recent to address industrial stormwater, including stormwater at steam electric power plants.[115] The MSGP requires a Stormwater Pollution Prevention Plan (SPPP), which is developed at each individual facility and is therefore tailored to the types and frequencies of storms experienced at each facility. This makes sense as a site prone to hurricanes may take different stormwater precautions than a site located in an arid climate.[116] As a result of site-specific permit requirements or voluntary efforts, some steam electric facilities already exceed the performance of a 10-year, 24-hour design standard and would have even less frequent stormwater-related discharge needs than envisioned by the definitional change in this final rule. For example, in a recent BA transport water purge request for the Four Corners Power Plant, the utility demonstrated the ability to fully recycle under a 10-year storm event, and only showed the need for discharge during a 100-year storm event.

For the final rule, in addition to requiring facilities to meet limitations applicable to low volume waste sources, to ensure facilities are not backing away from more protective management practices, the EPA is requiring that any necessary discharges of CRL, FGD wastewater, or BA transport water resulting from such a high-intensity, infrequent storm event be accompanied by an official certification statement that includes information that these discharges were necessary (*i.e.,* could not be managed with existing systems or practices). Importantly, nothing in this definitional change or the associated reporting and recordkeeping requirement changes a facility's obligations for stormwater management under its current permit or general permit. For further discussion of this reporting and recordkeeping requirement, see section XIV.C.4 of this preamble.

b. Definitional Change for Decommissioning Wastewater

When the EPA finalized non-zero limitations for FGD wastewater and BA transport water in the 2020 rule, facilities could discharge these wastewaters when decommissioning equipment after retirement. The EPA proposed zero-discharge limitations and at proposal did not specifically address the scenario in which plants may be decommissioning their zero-discharge treatment equipment. One commenter said that wastewater must be discharged from such equipment at the time of decommissioning and recommended that the Agency either retain the 2020 rule purge allowance or finalize an end-of-life flexibility that the EPA proposed in 2019 for ''wastewater present in equipment when a facility is retired from service.'' Another commenter, in the context of the permanent cessation of coal combustion subcategory, suggested that the Agency allow facilities to discharge wastewaters for 120 days after permanently ceasing coal combustion.

The EPA agrees with the commenter that, given the zero-discharge limitations being finalized for FGD wastewater and BA transport water in this rule, an end-of-life flexibility for certain discharges is warranted. More specifically, the EPA finds a limited definitional change, appliable to all EGUs, to allow one-time discharges associated with decommissioning an FGD wastewater treatment system or BA handling system after retirement is appropriate. Part of the basis for the zero-discharge limitations in this rule is tied to the ability of an active plant to recycle the wastewaters back into the plant (*e.g.,* as FGD makeup water). This is no longer the case when a facility retires. Furthermore, as discussed in the subsequent sections VII.C.3 and VII.C.4, the Agency is finalizing a tiered set of zero-discharge limitations for FGD wastewater and BA transport water at EGUs permanently ceasing coal combustion, but it is including time that allows for discharges of these wastewaters up to 120 days after the EGU ceases coal combustion, due to the technical constraints of achieving zero-discharge when active operations have ceased. Because there is no material difference in residual discharges from a decommissioned system at a plant retiring before the December 31, 2028, or December 31, 2034, dates in the permanent cessation of coal combustion subcategories, as compared to a plant retiring after those dates, it is consistent to treat facilities retiring before and after those dates the same. Thus, the EPA is excluding wastewater removed from wastewater treatment or ash handling equipment within the first 120 days of decommissioning the equipment from the definitions of FGD wastewater and transport water.

While the EPA is excluding this narrow class of wastewaters from the definitions of FGD wastewater and transport water, this does not mean that no limitations apply to discharges of such wastewater. As low volume waste sources (which are defined as wastewater from all sources except those for which specific limitations or standards are otherwise established in part 423), these discharges are subject to the BPT limitations for low volume waste sources, as well as any BAT limitations developed by the permitting authority on a BPJ basis. The EPA expects permitting authorities to consider any treatment technologies available at the plant in devising appropriate, case-by-case BAT limitations.

6. Clarification on the Interpretation of 40 CFR 423.10 (Applicability)

The EPA clarified at proposal that part 423 applies to discharges of legacy wastewater at inactive/retired power plants because the discharge of these wastewaters ''result[s] from the operation of a generating unit.'' [117] This

[115] Available online at: *https://www.epa.gov/npdes/stormwater-discharges-industrial-activities-epas-2021-msgp.*

[116] While climate change may be driving more extreme storm events in some areas, it is possible that, given this design and the age of the facility, the facility will never experience a situation where a stormwater-related discharge under this rule would be required before its retirement from service.

[117] 40 CFR 423.10. The provisions of the part apply to discharges resulting from the operation of a generating unit by an establishment whose generation of electricity is the predominant source of revenue or principal reason for operation, and whose generation of electricity results primarily from a process utilizing fossil-type fuel (coal, oil,

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interpretation is consistent with the EPA's longstanding view on the applicability of 40 CFR part 423 to inactive/retired plants, as well as with implementation by state permitting authorities. For example, in 2016, the South Carolina Department of Health and Environmental Control reissued a permit to the South Carolina Electricity & Gas Company's Canadys Station Site (SC0002020) which stated, ''Because electricity is not being generated, 40 CFR part 423-Steam Electric Power Generating Point-Source Category will only apply to the discharge of legacy wastewaters.'' [118] This is also consistent with the EPA's position provided in response to comments on the 2015 rule, in which the Agency stated:

> EPA disagrees with the commenter that the 'effluent limits would not apply' to discharges associated with retired units. For example, combustion residual leachate from landfills or surface impoundments containing combustion residuals from the time a generating unit was operating may occur and continue to be subject to the effluent limitations and standards requirements long after a generating unit is retired. Similarly, if an impoundment containing wastewater created while the generating unit was in operation (*e.g.,* FGD wastewater, fly ash or bottom ash transport water) were to discharge, it would certainly be discharging wastewater 'resulting from the operation of a generating unit.' In these instances, even though the generating unit may no longer be in operation, the wastewater is the result of its previous operation. Therefore, to the extent that steam electric power plants discharge wastestreams like this resulting from the operation of a generating unit, the ELGs do apply.[119]

Due to the proposed expansion of the RCRA CCR closure requirements to inactive surface impoundments at inactive (*i.e.,* retired) plants, some of these surface impoundments are expected to dewater and therefore discharge legacy wastewater. At proposal, the EPA sought to clarify the applicability of part 423 to these legacy wastewaters since the Agency was soliciting comment on establishing nationally applicable BAT limitations rather than reserving BAT limitations to be developed on a case-by-case basis using a permitting authority's BPJ. As described in section VII.B.4 of this preamble, the EPA is instead declining to establish a nationwide BAT for discharges of legacy wastewaters, except for those discharges of legacy wastewater described in section VII.C.6 of this preamble (which would not occur at previously retired facilities), and it is thus continuing to reserve these BAT limitations for case-by-case decision-making using the permitting authorities' BPJ. As a result, the applicability of part 423 to legacy wastewater discharges at inactive/retired plants would not impact the technology-based effluent limitations that apply to such discharges. In other words, the EPA's interpretation makes no difference to the ultimate disposition of legacy wastewater because, while the EPA interprets the rule to apply to legacy wastewater at inactive/retired steam electric power plants, the same BPJ approach called for in this rule would apply even if inactive/retired plants were not subject to part 423, given that BAT limitations must be developed on a BPJ basis where nationally applicable limitations do not apply. *See* CWA section 402(a)(1), 33 U.S.C. 1342(a)(1); 40 CFR 122.44, 125.3. For further discussion of these additional legacy surface impoundments, *see Legacy Wastewater at CCR Surface Impoundments—Estimated Volumes, Treatment Costs, and Pollutant Loadings* (DCN SE11503).

At proposal, the EPA also solicited comment on whether there are other wastewaters that may continue to be discharged after the retirement of a facility and the generation of electricity is the ''but for'' cause of the discharge. Some commenters suggested that the Agency should clarify its interpretation to include additional wastewaters such as CRL, while others disagreed that this would be a permissible reading of the regulation. Commenters opposed to an expansive reading stated that other wastewaters such as CRL generated after closure were not generated as a result of operating a generating unit, but as the result of precipitation percolating through a waste management unit. Commenters opposed to an expansive reading also pointed to the history of 40 CFR part 423, suggesting that the EPA never intended to cover CRL from retired power plants as it never evaluated these facilities.

The EPA agrees with commenters stating that discharges of CRL, even after retirement, result from the operation of a steam EGU. Were it not for operation of the unit, there could be no CRL discharges, regardless of whether there are other conditions that also exist to facilitate the discharge. Moreover, the EPA disagrees with commenters that the Agency never intended to cover CRL from retired power plants. As can be seen from the response to comment excerpt above, in 2015, the EPA expected that CRL discharges would continue to be subject to 40 CFR part 423 after a facility retired. This is an important clarification that makes it clear that the limitations being finalized, including those for subcategories, would continue to apply after the facility retires. At the same time, two other statements from the 2015 rule record demonstrate that the Agency only intended the regulations to cover leachate prospectively from the 2015 rule. First, also in the 2015 response to comments is the EPA's statement that:

> Retired landfills with or without leachate collection systems are not subject to the combustion residual leachate limitations and standards. EPA's methodology does not include costs or pollutant loadings removals from closed or retired landfills in its analyses.[120]

Second, in the 2015 TDD, the EPA stated that ''combustion residual leachate from retired units is not regulated in the final rule.'' These two statements, together with the earlier response to comments discussed above, reflect the actual approach finalized in the 2015 rule; namely, that only CRL generated and discharged at EGUs operating after the effective date of the 2015 rule was covered.[121] The approach taken in this final rule is consistent with that of the 2015 rule. That is, discharges of CRL (including unmanaged CRL) are covered prospectively by the final rule, but they will continue to be covered even after that facility and any waste management units generating CRL have retired. To the extent that a retired facility or closed waste management unit (WMU) is subject to 40 CFR part 423 but its discharges of CRL (including unmanaged CRL) are not subject to this rule, permitting authorities will instead continue to establish technology-based effluent limitations that reflect BAT using their BPJ. Thus, these facilities will have to meet BAT limitations for their discharges of CRL that are available, are economically achievable,

or gas), fuel derived from fossil fuel (*e.g.,* petroleum coke, synthesis gas), or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium. This part applies to discharges associated with both the combustion turbine and steam turbine portions of a combined cycle generating unit.

[118] DHEC (Department of Health and Environmental Control). 2016. *FACT SHEET AND PERMIT RATIONALE: South Carolina Electric & Gas Company, Canadys Station Site.* NPDES Permit No. SC0002020. May 16.

[119] U.S. EPA (Environmental Protection Agency). 2015. *Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category: EPA's Response to Public Comments.* September (SE05958A2) Page 3–563.

[120] U.S. EPA (Environmental Protection Agency). 2015. *Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category: EPA's Response to Public Comments.* September (DCN SE05958A6) Page 7–82.

[121] This is the case even though the Fifth Circuit Court of Appeals vacated and remanded the BAT limitations for CRL finalized in 2015.



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and have acceptable non-water quality environmental impacts.[122]

*C. Subcategories*

The EPA has authority in a national rulemaking to establish different limitations for different plants after considering the statutory factors listed in CWA section 304(b). *See Texas Oil & Gas Ass'n* v. *EPA,* 161 F.3d at 938 (stating that the CWA does not ''exclude a rule allowing less than perfect uniformity within a category or subcategory.'').

In the 2015 rule, the EPA established subcategories for small EGUs (less than or equal to 50 MW nameplate capacity) and oil-fired EGUs. In this rulemaking, the EPA did not propose to revise or eliminate these subcategories and did not receive any comments on removing such subcategories; therefore, this final rule keeps the 2015 subcategories intact.

In the 2020 rule, the EPA established additional subcategories for high FGD flow facilities (EGUs with FGD purge flows of greater than 4 million gallons per day), LUEGUs (EGUs with a capacity utilization rating of less than 10 percent per year), and EGUs permanently ceasing coal combustion by 2028. For these subcategorized units, the EPA established different limitations using different technology bases as compared to the limitations applicable to the rest of the steam electric point source category. In 2023, the EPA proposed to eliminate the 2020 rule's high FGD flow subcategory and LUEGU subcategory, but also proposed to retain the permanent cessation of coal combustion by 2028 subcategory.

Based on public comment, in this final rule, the EPA is eliminating the 2020 rule's high FGD flow subcategory, as well as the LUEGU subcategory, but is retaining the permanent cessation of coal combustion by 2028 subcategory. These three subcategories are addressed in subsections 1–3 below.

In addition, the final rule creates three new subcategories based on the proposal, as described further in subsections 4–6 below. These subcategories are for (1) EGUs permanently ceasing coal combustion by 2034, (2) discharges of unmanaged CRL, and (3) discharges of legacy wastewater from surface impoundments that will commence closure under the CCR regulations after the effective date of this final rule. For these subcategorized units, the EPA is establishing different limitations (using different technology bases) than the ones applicable to the rest of the steam electric point source category.

1. Plants With High FGD Flows

Except as discussed in section VII.C.4 of this preamble, as proposed, the EPA is eliminating the high FGD flow subcategory promulgated in the 2020 rule. The EPA finds that, after evaluating public comments, along with the record and factors specified in CWA section 304(b)(2)(B), the subcategory is no longer warranted.

At the time of the 2020 rule, the EPA's understanding was that this subcategory would apply to only one facility, TVA Cumberland, which operated with FGD purge flows of over 400 million gallons per day. The EPA based the creation of the subcategory on the supposedly disparately high costs that would result from high FGD flows at this facility and thus the need to install a larger, more costly treatment system than at other EGUs.

Several commenters on the 2019 and 2023 proposals claimed that this subcategory of one facility was inconsistent with the CWA, and further argued that the costs estimated for TVA were overestimated and not disparately high as compared to other facilities.[123] The EPA acknowledges that its cost estimates were higher than TVA's own estimates for installing biological treatment, and thus costs may not be as disparately high as indicated in the 2020 rule.

Since the 2020 rule, TVA has announced a notice in the **Federal Register** of plans to retire the facility, which are further detailed in a draft Environmental Impact Statement (EIS). *See* 86 FR 25933 (May 11, 2021). This draft EIS solicits comment on three alternatives, all of which include retirement but with different electricity replacement scenarios. While TVA's comments on the 2023 proposed rule still appear to support retaining this subcategory, its comments also confirm that TVA plans to retire the Cumberland plant.

Due to TVA's retirement plans, the EPA finds that this subcategory is no longer warranted based on the rationale provided in the 2020 rule. As appears in its **Federal Register** document, all the alternatives TVA is considering (including its preferred alternative) would result in the plant's retirement. To the extent that the plant is able to participate in the permanent cessation of coal combustion by 2028 subcategory, the plant's limitations would be based on surface impoundments.[124] To the extent that the plant operates beyond 2028, it would be able to participate in the permanent cessation of coal combustion by 2034 subcategory (discussed below in section VII.C.4 of this preamble) and have limitations based on chemical precipitation (the same 2020 rule limitations applicable to plants in the high FGD flow subcategory). Thus, there would be no costs to TVA Cumberland associated with the more stringent, zero-discharge limitations in this final rule, and thus no disparate costs. Disparate costs were the sole rationale for the high FGD flow subcategory, and neither the EPA nor commenters have identified alternative bases that could serve to support this subcategory. Furthermore, after the retirement of TVA Cumberland, because this plant was the only one qualifying as a high flow facility, this subcategory becomes a null set; therefore, the EPA is eliminating the subcategory.

2. LUEGUs

Except as discussed in section VII.C.4 of this preamble for the new permanent cessation of coal combustion subcategory, as proposed, the EPA is eliminating the LUEGU subcategory after evaluating public comments received and the record as it informs the factors specified in CWA section 304(b)(2)(B). The EPA finds that the subcategory is no longer warranted. The EPA established the subcategory for LUEGUs in the 2020 rule based on cost (disparate capital costs), non-water quality environmental impacts (energy reliability), and other factors the Administrator deemed appropriate (*i.e.,* harmonization with CAA and RCRA regulations that apply to electric utilities).

The EPA received comments on the proposal both in support of and opposition to eliminating this subcategory. Commenters supporting elimination of the subcategory agreed with the statements and findings included in the EPA's proposal that the

[122] The EPA conservatively included closed WMUs in its cost analyses when they were located at active facilities. CRL flows at composite-lined landfills could be comingled with the flows from adjacent, active landfill cells. Furthermore, unmanaged CRL flows could be caught up in site-wide pump-and-treat operations where both active and closed WMUs are present. Thus, while this is a conservative assumption, it is a reasonable estimate that helps ensure the costs of the rule are not underestimated and are economically achievable.

[123] The EPA notes that these commenters were also petitioners in the consolidated *Appalachian Voices* case discussed in section IV of this preamble.

[124] TVA submitted a NOPP for the permanent cessation of coal combustion subcategory to the Tennessee Department of Environment and Conservation on October 6, 2021. To date, the EPA is not aware of any actions taken at the facility to meet the limitations in the high flow subcategory no later than December 31, 2023, as required to participate in this subcategory.



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2020 LUEGU subcategory is no longer warranted based on the factors originally cited. Commenters opposed to elimination of this subcategory faulted the EPA for several reasons. First, they contended that the EPA could not evaluate the subcategory without better understanding how many plants intend to make use of it. In particular, they claimed that the EPA's understanding of the universe of plants intending to make use of the subcategory is not based on a comprehensive accounting of NOPPs and facilities with LUEGU limitations included via the transfer provisions of the 2020 rule, contained in § 423.13(o), which allow facilities to transfer into the LUEGU subcategory automatically without requesting a permit modification. Second, these commenters reiterated the findings in the 2020 rule and claimed they supported creation of the subcategory. Finally, the commenters disputed the proposal's characterization of GSP Merrimack Station, the only plant currently seeking to participate in this subcategory.

Under the 2020 rule, a facility wishing to avail itself of the limitations available in the subcategories for low utilization or permanent cessation of coal combustion, or any facility wishing to participate in the VIP, was required to file a NOPP by October 13, 2021. The EPA acknowledges that facilities and permitting authorities were not required to provide NOPPs to the EPA as part of the 2020 rule. Instead, the EPA obtained NOPP submissions through normal permit reviews, as courtesy copies, in providing technical support to state permitting authorities, and via the sharing of a set of NOPPs that environmental groups had already collected. In total, these NOPPs cover 94 EGUs at 38 plants—about 34 percent of all facilities predicted to incur costs under the 2020 rule.[125] Furthermore, the EPA did not receive comments from any facilities stating that they had filed NOPPs of which the EPA was not aware. Most of these NOPPs are from plants wishing to avail themselves of flexibilities in the 2020 rule other than the LUEGU subcategory. Only one facility indicated it would like to avail itself of the BAT limitations in the subcategory for LUEGUs: the GSP Merrimack Station in Bow, New Hampshire.

On March 27, 2024, GSP issued a press release announcing a settlement with the EPA whereby GSP has committed to permanently ceasing coal combustion at Merrimack Station no later than June 1, 2028. This dates is memorialized in a Settlement Agreement that arose out of an Alternative Dispute Resolution process conducted in connection with an administrative appeal of an NPDES permit modification for Schiller Station.[126] As a result of the only known facility with LUEGUs retiring and no comments revealing the existence of any other LUEGU, the EPA is eliminating the LUEGU subcategory in this final rule, except to the extent it supports entry into the new permanent cessation of coal by 2034 subcategory discussed below.

3. EGUs Permanently Ceasing Coal Combustion by 2028

The EPA is retaining the subcategory for EGUs permanently ceasing coal combustion by 2028 after evaluating public comments and the record in light of the factors specified in CWA section 304(b)(2)(B) and finding that the subcategory continues to be warranted. For EGUs in this subcategory, the EPA is also retaining the 2020 rule BAT limitations based on surface impoundments.

The EPA proposed to retain the subcategory for EGUs permanently ceasing coal combustion by 2028 and simultaneously extended the NOPP filing date through a companion direct final rulemaking. *See* 88 FR 18440 (March 20, 2023). No commenter argued for the elimination of this subcategory, though commenters disagreed about any potential changes. Some commenters suggested extending the latest date to permanently cease coal combustion beyond December 31, 2028, while other commenters opposed any extension of this date. Similarly, some commenters sought additional transparency and enforceability of the criteria to permanently cease coal combustion while other commenters opposed such modifications. In the subsections below, the EPA discusses why this subcategory continues to be warranted and why it is retaining the BAT technology bases for this subcategory. The EPA also discusses the zero-discharge limitations that apply after ceasing coal combustion, as well as reporting and recordkeeping requirements in the final rule.

a. The subcategory continues to be warranted based on several statutory factors.

The EPA established this subcategory in the 2020 rule based on the statutory factors of cost, the age of the equipment and plants involved, non-water quality environmental impacts (including energy requirements), and such other factors as the Administrator deems appropriate (harmonization with the CCR regulations' alternative closure provisions). The EPA notes the unanimous agreement that this subcategory should be retained, and it agrees with commenters, although the EPA is no longer relying on cost as a primary basis for this subcategory, as discussed below.

In particular, the EPA recognizes that, based on the creation of this subcategory, which was part of the 2020 rule, many plants have begun moving forward with plans to retire or repower in the then-eight-year time frame afforded under that rule. In the 2020 rule, EPA described how recent NERC reliability assessments showed one region that was not anticipated to meet its reference margin [127] and another region that was anticipated to be very close to its reference margin (and these assessments are consistent with NERC's *2023 Long-Term Reliability Assessment*). Therefore, for the 2020 rule, the EPA found that premature closure of some plants and/or EGUs as a result of the general, industry-wide limitations would be an unacceptable non-water quality environmental impact because it could impact reliability. Utilities with a limited remaining useful life have planned and budgeted for replacement capacity under timelines approved by public utility commissions (PUCs) and public service commissions (PSCs) as part of the normal integrated resource planning process. These submissions were made since the 2020 rule, as part of the 2020 rule's eight-year window to permanently cease coal combustion. The EPA does not think that it should disrupt these ongoing plans by changing the date halfway through the period that plants have moved forward with those plans. Maintaining the same timeframe allowed by the prior rule supports efforts planned for the orderly transition of generating capacity as a result of the 2020 rule in a way that helps ensure

[125] Four units at two plants are represented twice. NOPPs for two units were initially filed by one plant for the VIP, and NOPPs for two separate units were initially filed by another plant for the LUEGU subcategory. Both plants then filed new NOPPs for their two units to permanently cease coal combustion by 2028.

[126] *See, e.g., https://indepthnh.org/2024/03/27/last-coal-plants-in-new-england-to-voluntarily-close-transitioning-to-renewable-energy-parks/.*

[127] ''Reference margins, which differ by region, are reserve margin targets based on each area's load, generation capacity, and transmission characteristics. In some cases, the reference margin level is a requirement implemented by states, provinces, independent system operators, or other regulatory bodies. Reliability entities in each region aim to have their anticipated reserve margins surpass their reference margins, which are generally set near 15% in most regions.'' Available online at: *https://www.eia.gov/todayinenergy/detail.php?id=31492.*



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grid reliability and weighs in favor of retaining the same date in this rule.

With respect to air pollution, a non-water quality environmental impact, the EPA notes that several utilities have decided to make use of this subcategory where they may not have previously had plans to retire by 2028. For example, the DTE Energy Company filed a NOPP for this subcategory for its Belle River Power Plant and is now planning to retire in 2028 rather than 2030. Replacing coal-fired capacity with natural gas, renewables, and other sources leads to decreased emissions of several air pollutants. The subcategory allows utilities seeking to retire by 2028 to do so and achieve the associated air pollution and solid waste reductions, which further supports the finding that the subcategory continues to be warranted.

In addition, the EPA still wishes to harmonize this rule with the CCR alternative closure provisions as described in the proposal, and those provisions have not changed. Twenty-five plants are seeking to use the alternative closure provisions under the CCR regulations, which allow for closure of the unlined impoundment(s) and the power plant no later than 2023 (for surface impoundments under 40 acres) or 2028 (surface impoundments over 40 acres).[128] Elimination of the permanent cessation of coal combustion subcategory from this ELG could interfere with the plans of utilities with surface impoundments in the 2028 category, complicating their compliance with the CCR regulations. Furthermore, the EPA has also finalized additional flexibility under the Good Neighbor Plan, discussed in section IV.E.2.a of this preamble.[129] Harmonization between regulations on air, water, and land pollution gives industry certainty to plan and implement these requirements in an orderly, efficient manner.

Although the EPA concludes that the previous factors are sufficient to justify the retention of this subcategory, the EPA also notes that, with respect to cost, the 2020 rule record included an analysis showing that amortization of capital costs for less than the typical 20-year life of pollution control equipment leads to greater annualized costs per MWh as compared to costs at EGUs that are not retiring or repowering. Many plants made decisions at the time of the 2020 rule to opt for the alternative retirement compliance pathway, and they are now several years into meeting the milestones for that path. In this case, a change in the rule requiring these facilities to install new treatment technologies would result in even shorter timeframes and even greater costs per MWh. Thus, the EPA finds that cost provides an additional basis for the subcategory.

After considering all the information above, the EPA finds that the record and statutory factors discussed above continue to support this 2020 subcategory and associated limitations. Each of these bases, discussed above and supported by a statutory factor, provide a separate and independent basis for subcategorization, save for the cost basis which serves as additional support. Thus, the EPA is retaining this subcategory in its current form. This includes retaining the BAT technology basis for limitations applicable to EGUs in this subcategory, surface impoundments. Surface impoundments are technologically available, are economically achievable, and have acceptable non-water quality environmental impacts as applied to this subcategory. They represent BAT for this subcategory because they support the ability of plants with a limited remaining useful life to continue with their ongoing plans for orderly retirement or repowering. The EPA also notes that they would not lead to higher costs for facilities based on the remaining useful life of their EGUs. The EPA did not select any other technology for this subcategory because it would disrupt plants' already approved, ongoing plans for ceasing coal combustion by 2028. The EPA also notes that imposing more stringent BAT limitations on EGUs in this subcategory would subject them to greater costs per MWh, as compared to EGUs in the general industry, given that these EGUs have a limited remaining useful life.

b. The final rule includes post-coal combustion cessation zero-discharge limitations for EGUs in this subcategory to avoid circumvention.

The EPA proposed to include zero-discharge limitations applicable after the permanent cessation of coal combustion date, December 31, 2028, for all discharges in this subcategory. The goal of these limitations was to ensure that a facility does not manipulate the flexibilities in 40 CFR part 423 to avoid meeting industry-wide zero-discharge limitations and then simply keep discharging without relevant permit limitations being applicable to them. The EPA received several comments on these limitations that would apply after the permanent cessation of coal combustion date. Some commenters expressed a preference for them and sought an even stronger requirement that the zero-discharge limitations be retroactive. Other commenters suggested that these limitations are not necessary, are unduly burdensome, and are not cost-free, even where a facility successfully permanently ceases coal combustion by the specified date. One commenter in the latter category suggested a 120-day flexibility for facilities that permanently ceased coal combustion to allow for some residual discharges of these wastewaters as necessary, subject to requirements no more stringent than BPT limitations.

After considering these comments, the EPA is finalizing zero-discharge limitations that would apply after the permanent cessation of coal combustion date, December 31, 2028, with modifications from the proposal, in order to ensure that the eligibility for participation in this subcategory designed for EGUs that permanently cease coal combustion is not circumvented. The modifications the EPA made to these limitations following proposal are based on legitimate concern raised in public comments concerning the potential need to discharge for a relatively short period of about fourth months following the permanent cessation of coal combustion. For example, a facility retiring on December 31, 2028, may still need to discharge the wastewater remaining in existing tanks from the final hours and days of lawful operations. The EPA does not wish to interfere with owner/operator plans for the permanent cessation of coal combustion or discourage the use of this subcategory by unfairly preventing any residual discharges that are necessary after coal combustion has permanently ceased.

The final rule reflects that the EPA continues to view zero-discharge limitations that apply following the permanent cessation of coal combustion date as an appropriate tool to avoid circumvention, as well as some flexibility to account for legitimate concern regarding the need to discharge following the permanent cessation of coal combustion date. The final rule thus contains a tiered set of zero-discharge limitations applicable following December 31, 2028:

[128] Further information is available online at: *https://www.epa.gov/coalash/coal-combustion-residuals-ccr-part-implementation.*

[129] To facilitate a potentially economic and environmentally superior unit-level compliance response across the programs that nonetheless maintains the $NO_X$ reductions required by the state budgets from 2026 forward in the proposal, the EPA requested comment on potentially deferring the application of the backstop daily rate for large coal EGUs that submit written attestation to the EPA that they make an enforceable commitment to retire by no later than the end of calendar year 2028. 87 FR 20036, 20122 (April. 6, 2022).



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- The first tier of these limitations is composed of zero-discharge limitations for FGD wastewater and BA transport water after April 30, 2029. These limitations would apply if the EGU had in fact permanently ceased coal combustion by December 31, 2028, as the plant represented it would. As suggested in the comments, this date is 120 days after the latest permanent cessation of coal combustion date, allowing for facilities to complete any necessary residual decommissioning discharges.[130]
- The second tier is composed of zero-discharge limitations for these same wastewaters after December 31, 2028. If a plant fails to cease combustion of coal by 2028, as it represented it would, for any reason other than those specified in section 423.18, these zero-discharge limitations would automatically apply.

Dischargers to which the second tier applies, the EPA notes, would be subject not only to this rule's requirements, but also to enforcement for false statements in their filings under § 423.19—for example, statements made in the NOPP, in the annual progress reports, in the notice of material delay, and for failure to file a notice of material delay in a timely fashion. Any reporting and recordkeeping violations would also be subject to enforcement. The EPA finds that, together, the zero-discharge limitations and reporting and recordkeeping requirements, as modified below, are sufficient to ensure that facilities do not unfairly benefit by continuing to discharge after the subcategory's permanent cessation of coal combustion date.

c. The final rule includes additional reporting and recordkeeping requirements for EGUs in this subcategory.

For a discussion of additional reporting and recordkeeping requirements, see section XIV.C.1 of this preamble.

4. EGUs Permanently Ceasing Coal Combustion by 2034

The EPA proposed a new ''early adopter'' subcategory for EGUs permanently ceasing coal combustion by December 31, 2032, with certain eligibility criteria targeted toward those plants that had already installed the FGD and BA technology bases on which the 2020 rule rested by the date of the 2023 proposed rule. The EPA solicited comment on whether the permanent cessation of coal combustion date should be earlier or later than 2032, as well as the propriety of the proposed criteria based on technology adoption for the subcategory. Based on public comments, the EPA is finalizing the new subcategory, except that the date for permanently ceasing coal combustion is December 31, 2034, rather than 2032. In addition, the EPA is not establishing strict eligibility criteria that would have narrowed the universe of plants to which this subcategory might apply. Through public comments, the EPA learned that, while many plants have continued to move toward compliance with the 2020 rule limitations, including by making various expenditures toward that goal (*e.g.,* securing contracts, conducting pilots, etc.), relatively few had actually installed the technologies on which the 2020 rule limitations were based by the time the 2023 proposed rule was published. In some cases, this was due to the timing of when a plant's NPDES permit was expected to be renewed. As a result, the cutoff that the EPA proposed—in terms of both the date for adoption and what steps constituted adoption—as well as other cutoffs that the EPA considered, would not necessarily capture the universe of plants that the EPA intended to capture. Moreover, the bases for this subcategory in terms of the statutory factors, as discussed further below, support this subcategory even without the proposed requirement for installation of the 2020 rule BAT technologies by the 2023 proposed rule date.

For EGUs that permanently cease coal combustion by December 31, 2034, the EPA is establishing limitations for FGD wastewater and BA transport water that are the same as those in place following the effective date of the 2020 rule. These limitations differed for some EGUs if they participated in a subcategory promulgated by the 2020 rule, but for the general industrial category consisted of limitations based on chemical precipitation followed by low residence time biological reduction treatment for FGD wastewater and limitations based on high recycle rate systems for BA transport water.

The final rule also covers discharges of CRL from EGUs in the new permanent cessation of coal combustion subcategory. The EPA notes that facilities discharge CRL either alone or in combination with FGD wastewater and BA transport water. The EPA solicited comment at proposal on the treatment of CRL at EGUs that will soon permanently cease coal combustion and close their CCR landfills. In response to this solicitation, several commenters recommended either including CRL in any new permanent cessation of coal combustion subcategory or creating a separate subcategory for CRL generated at landfills nearing closure. Several commenters recommended that CRL discharged from retired EGUs or EGUs that were about to retire should be subcategorized to avoid imposing disparate costs. One commenter pointed to the Agency's findings that the volume of CRL generated after closure of a landfill was approximately an order of magnitude lower than the volume of CRL generated during that landfill's operation.

The EPA agrees with many of these comments and is including CRL as one of the wastestreams covered by the new permanent cessation of coal combustion by 2034 subcategory. While an EGU is still combusting coal, that combustion generates CCR, which in turn generates CRL. As well as being tied to ongoing operations during a facility's remaining useful life (as are FGD wastewater and BA transport water), CRL can be comanaged with FGD wastewater (as is currently done at some facilities). Furthermore, including CRL in this subcategory promotes ease of administration, avoiding the creation of a separate subcategory for CRL designed to accomplish the same fundamental goals.

For CRL discharged at EGUs in this subcategory, the EPA is reserving BAT limitations to be developed on a BPJ basis by the permitting authority until the permanent cessation of coal combustion, after which the EPA is establishing mercury and arsenic limitations based on chemical precipitation, which are the same limitations that EPA proposed for all discharges of CRL.

The EPA received a number of comments on the overall propriety of the proposed subcategory. Though commenters were split, many supported a new subcategory for additional flexibility but disagreed with the contours of what the EPA proposed. After considering the comments and evaluating the record in light of the factors specified in CWA section 304(b)(2)(B), the EPA finds that a new permanent cessation of coal combustion subcategory is warranted. The statutory bases for this subcategory are discussed in the subsection below. The rationale for the selected BAT technology bases appears thereafter, as well as the rationale for rejecting other technologies. Importantly, this subcategory is in addition to the 2020 rule's permanent cessation of coal combustion by 2028 subcategory, which is carried forward in this rule. While the

[130] The EPA notes that these do not include discharges of legacy wastewaters from surface impoundments closing under the CCR rule, which are covered by different regulatory provisions.



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two subcategories are similar in that they apply to EGUs that plan to permanently cease combustion of coal, they differ as discussed below.

a. This subcategory is justified based on several statutory factors.

This subcategory is supported by consideration of three CWA section 304(b) statutory factors: age of equipment and facilities involved, non-water quality environmental impacts, and cost. The EPA notes that the cost factor supports subcategorization, but it is not relying on that factor as a primary basis for the subcategory. Each of the bases discussed below and supported by a statutory factor provide a separate and independent basis for subcategorization, except for cost, which simply provides additional support.

*Age of the equipment and facilities involved.* The EPA recognizes that this 2024 rule establishes new, more stringent limitations over the limitations promulgated in 2020. For some plants, that means that they may no longer be able to rely on parts of the wastewater treatment systems they installed to meet the 2020 limitations to meet the new 2024 limitations. Under the Act's technology-forcing regime, imposing limitations requiring facilities to shift installation to new pollution control technologies is warranted as more effective technologies are available and economically achievable. In the particular circumstances here, however, the ''age of equipment and facilities involved'' supports allowing plants with EGUs permanently ceasing combustion of coal by December 31, 2034, to continue to meet limitations under the 2020 rule. Such facilities either have recently or are in the process of installing technologies to meet the 2020 rule limitations and, rather than require these facilities to also install technologies to meet limitations under the 2024 rule as well, given the short remaining useful life of certain plants, the EPA views it as reasonable to provide flexibility in this rule for plants with EGUs permanently ceasing combustion of coal by December 31, 2034.

There are many coal-fired EGUs that have announced a retirement or fuel conversion that would occur after December 31, 2028, which is the date used to establish the 2020 subcategory applicable to EGUs permanently ceasing coal combustion. In table VII–2 below, the EPA presents all of the announcements at EGUs estimated to potentially make new investments under this final ELG rule.



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**TABLE VII-2. Announced Coal-Fired EGU Retirements and Fuel Conversions**

| # | EIA ID | Plant Name | State | Unit # | Nameplate Capacity | Year Retire or Convert |
|---|---|---|---|---|---|---|
| 1 | 6113 | Gibson Generating Station | IN | 3 | 627 | 2029 |
| 2 | 6113 | Gibson Generating Station | IN | 4 | 631 | 2029 |
| 3 | 298 | Limestone Electrical Generating Station | TX | 1 | 893 | 2029 |
| 4 | 298 | Limestone Electrical Generating Station | TX | 2 | 956.8 | 2029 |
| 5 | 1893 | Boswell Energy Center | MN | 3 | 364.5 | 2029 |
| 6 | 8219 | Ray D Nixon | CO | 1 | 207 | 2029 |
| 7 | 6761 | Rawhide Energy Station | CO | 1 | 293 | 2029 |
| 8 | 2712 | Roxboro Steam Plant | NC | 1 | 410.8 | 2029 |
| 9 | 2712 | Roxboro Steam Plant | NC | 2 | 657 | 2029 |
| 10 | 6021 | Craig Station | CO | C3; 3 | 474.4 | 2030 |
| 11 | 55479 | Wygen 1 | WY | 1 | 95 | 2030 |
| 12 | 6641 | Independence Plant | AR | 1 | 850 | 2030 |
| 13 | 6641 | Independence Plant | AR | 2 | 850 | 2030 |
| 14 | 470 | Comanche Station | CO | 3 | 856.8 | 2030 |
| 15 | 8066 | Jim Bridger Power Plant | WY | 3 | 577.9 | 2030 |
| 16 | 8066 | Jim Bridger Power Plant | WY | 4 | 584 | 2030 |
| 17 | 6068 | Jeffrey Energy Center | KS | 3 | 680.936 | 2030 |
| 18 | 7210 | Cope | SC | ST1 | 432.9 | 2030 |
| 19 | 663 | Deerhaven Generating Station | FL | 2 | 250.7 | 2031 |
| 20 | 2442 | Four Corners Steam Electric Station | NM | 4 | 818.1 | 2031 |
| 21 | 2442 | Four Corners Steam Electric Station | NM | 5 | 818.1 | 2031 |
| 22 | 6165 | Hunter Plant | UT | 1 | 461 | 2031 |
| 23 | 3403 | Gallatin | TN | 1 | 300 | 2031 |
| 24 | 3403 | Gallatin | TN | 2 | 300 | 2031 |
| 25 | 3403 | Gallatin | TN | 3 | 327.6 | 2031 |
| 26 | 3403 | Gallatin | TN | 4 | 327.6 | 2031 |
| 27 | 6249 | Winyah Generating Station | SC | 1 | 315 | 2031 |
| 28 | 6249 | Winyah Generating Station | SC | 2 | 315 | 2031 |
| 29 | 6249 | Winyah Generating Station | SC | 3 | 315 | 2031 |
| 30 | 6249 | Winyah Generating Station | SC | 4 | 315 | 2031 |
| 31 | 8223 | Springerville Generating Station | AZ | 2 | 424.8 | 2032 |
| 32 | 8069 | Huntington | UT | 1 | 498 | 2032 |
| 33 | 8069 | Huntington | UT | 2 | 498 | 2032 |
| 34 | 3298 | Williams Station | SC | ST1 | 586.4 | 2032 |
| 35 | 6177 | Coronado Generating Station | AZ | U1B; CO1 | 456 | 2032 |
| 36 | 6177 | Coronado Generating Station | AZ | U2B; CO2 | 456 | 2032 |
| 37 | 1241 | LaCygne Generating Station | KS | 1 | 893 | 2032 |
| 38 | 2727 | Marshall Steam Station | NC | 3 | 710 | 2032 |
| 39 | 2727 | Marshall Steam Station | NC | 4 | 710 | 2032 |
| 40 | 1733 | Monroe Power Plant | MI | 1 | 817.2 | 2032 |
| 41 | 1733 | Monroe Power Plant | MI | 2 | 822.6 | 2032 |



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| | | | | | | |
|---|---|---|---|---|---|---|
| 42 | 6165 | Hunter Plant | UT | 2 | 461 | 2032 |
| 43 | 6165 | Hunter Plant | UT | 3 | 490 | 2032 |
| 44 | 1379 | Shawnee | KY | 1 | 175 | 2033 |
| 45 | 1379 | Shawnee | KY | 2 | 175 | 2033 |
| 46 | 1379 | Shawnee | KY | 4 | 175 | 2033 |
| 47 | 1379 | Shawnee | KY | 5 | 175 | 2033 |
| 48 | 1379 | Shawnee | KY | 6 | 175 | 2033 |
| 49 | 1379 | Shawnee | KY | 7 | 175 | 2033 |
| 50 | 1379 | Shawnee | KY | 8 | 175 | 2033 |
| 51 | 1379 | Shawnee | KY | 9 | 175 | 2033 |
| 52 | 7790 | Bonanza Power Plant | UT | 1 | 500 | 2033 |
| 53 | 628 | Crystal River Energy Complex | FL | 4; ST4 | 739.3 | 2034 |
| 54 | 628 | Crystal River Energy Complex | FL | 5 | 739.3 | 2034 |
| 55 | 1040 | Whitewater Valley | IN | 1 | 33 | 2034 |
| 56 | 1040 | Whitewater Valley | IN | 2 | 60 | 2034 |
| 57 | 6090 | Sherburne County Generating Plant | MN | 3 | 1000 | 2034 |
| 58 | 2712 | Roxboro Steam Plant | NC | 3 | 745.2 | 2034 |
| 59 | 2712 | Roxboro Steam Plant | NC | 4 | 745.2 | 2034 |
| 60 | 6113 | Gibson Generating Station | IN | 1 | 635 | 2035 |
| 61 | 6113 | Gibson Generating Station | IN | 2 | 635 | 2035 |
| 62 | 2721 | James E Rogers Energy Complex (f.k.a. Cliffside Steam Station) | NC | 6 | 909.5 | 2035 |
| 63 | 703 | Georgia Power Company - Plant Bowen | GA | 3 | 952 | 2035 |
| 64 | 703 | Georgia Power Company - Plant Bowen | GA | 4 | 952 | 2035 |
| 65 | 6018 | East Bend Station | KY | 2 | 600 | 2035 |
| 66 | 1004 | Edwardsport Generating Station | IN | CT1; CT2; ST | 618 | 2035 |
| 67 | 8042 | Belews Creek Steam Station | NC | 1 | 1245 | 2035 |
| 68 | 8042 | Belews Creek Steam Station | NC | 2 | 1245 | 2035 |
| 69 | 56068 | Elm Road Generating Station | WI | 1 | 701.3 | 2035 |
| 70 | 56068 | Elm Road Generating Station | WI | 2 | 701.3 | 2035 |
| 71 | 1356 | Ghent | KY | 1 | 557 | 2037 |
| 72 | 1356 | Ghent | KY | 3 | 557 | 2037 |
| 73 | 1356 | Ghent | KY | 4 | 556 | 2037 |
| 74 | 6138 | Flint Creek Power Plant | AR | 1 | 558 | 2038 |
| 75 | 6065 | Iatan Generating Station | MO | 1 | 726 | 2039 |
| 76 | 1241 | LaCygne Generating Station | KS | 2 | 685 | 2039 |
| 77 | 4158 | Dave Johnston Plant | WY | 4 | 360 | 2039 |
| 78 | 6068 | Jeffrey Energy Center | KS | 1 | 680.936 | 2039 |
| 79 | 6068 | Jeffrey Energy Center | KS | 2 | 680.936 | 2039 |
| 80 | 6101 | Wyodak Power Plant | WY | 1 | 362 | 2039 |
| 81 | 2876 | OVEC - Kyger Creek Station | OH | 1 | 217.26 | 2040 |
| 82 | 2876 | OVEC - Kyger Creek Station | OH | 2 | 217.26 | 2040 |
| 83 | 2876 | OVEC - Kyger Creek Station | OH | 3 | 217.26 | 2040 |
| 84 | 2876 | OVEC - Kyger Creek Station | OH | 4 | 217.26 | 2040 |
| 85 | 2876 | OVEC - Kyger Creek Station | OH | 5 | 217.26 | 2040 |
| 86 | 3948 | Mitchell Plant | WV | 1 | 816.3 | 2040 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 87 | 3948 | Mitchell Plant | WV | 2 | 816.3 | 2040 |
| 88 | 6264 | Mountaineer Plant | WV | 1 | 1300 | 2040 |
| 89 | 983 | Clifty Creek Station | IN | 1 | 217.26 | 2040 |
| 90 | 983 | Clifty Creek Station | IN | 2 | 217.26 | 2040 |
| 91 | 983 | Clifty Creek Station | IN | 3 | 217.26 | 2040 |
| 92 | 983 | Clifty Creek Station | IN | 4 | 217.26 | 2040 |
| 93 | 983 | Clifty Creek Station | IN | 5 | 217.26 | 2040 |
| 94 | 983 | Clifty Creek Station | IN | 6 | 217.26 | 2040 |
| 95 | 3935 | John E. Amos Plant | WV | 1 | 816.3 | 2040 |
| 96 | 3935 | John E. Amos Plant | WV | 2 | 816.3 | 2040 |
| 97 | 3935 | John E. Amos Plant | WV | 3 | 1300 | 2040 |
| 98 | 6095 | Sooner Power Plant | OK | 1 | 569 | 2044 |
| 99 | 3470 | W. A. Parish E.G.S. | TX | 5 | 734.1 | 2045 |
| 100 | 3470 | W. A. Parish E.G.S. | TX | 6 | 734.1 | 2045 |
| 101 | 3470 | W. A. Parish E.G.S. | TX | 7 | 614.6 | 2045 |
| 102 | 3470 | W. A. Parish E.G.S. | TX | 8 | 614.6 | 2045 |
| 103 | 6095 | Sooner Power Plant | OK | 2 | 569 | 2045 |
| 104 | 963 | Dallman | IL | 4 | 230.1 | 2045 |
| 105 | 2952 | Muskogee Generating Station | OK | 6 | 572 | 2049 |
| 106 | 1167 | Muscatine Power and Water Generating Station | IA | 7 | 25 | 2052 |
| 107 | 1167 | Muscatine Power and Water Generating Station | IA | 8A; 8 | 93.05 | 2052 |
| 108 | 1167 | Muscatine Power and Water Generating Station | IA | 9 | 175.5 | 2052 |
| 109 | 2828 | Cardinal | OH | 1 | 615.2 | 2052 |
| 110 | 2828 | Cardinal | OH | 2 | 615.2 | 2052 |
| 111 | 1364 | Mill Creek | KY | 3 | 411 | 2052 |
| 112 | 1364 | Mill Creek | KY | 4 | 496 | 2052 |
| 113 | 2817 | Leland Olds Station | ND | 1 | 216 | 2052 |
| 114 | 2817 | Leland Olds Station | ND | 2 | 440 | 2052 |
| 115 | 645 | Tampa Electric - Big Bend Station | FL | ST4 | 486 | 2052 |
| 116 | 136 | Seminole Generating Station | FL | 2 | 714.6 | 2052 |
| 117 | 3943 | Fort Martin Power Station | WV | 1 | 552 | 2052 |
| 118 | 3943 | Fort Martin Power Station | WV | 2 | 555 | 2052 |
| 119 | 6071 | Trimble County | KY | 1 | 566 | 2066 |
| 120 | 6071 | Trimble County | KY | 2 | 737.7 | 2066 |

* Entries 55 and 106 are EGUs less than 50 MW and therefore are not expected to be impacted by the rule

**While the EPA could not confirm the retirement of Shawnee 3 based on publicly available announcements at the time of analysis, during the 12866 review process, TVA confirmed that Shawnee 3 is also retiring in 2033. To the extent that the EPA has overestimated costs for Shawnee in its analysis, the analysis is conservative.

As seen in the table above, there have been 120 announcements that cover the years from 2029 to 2066. Of these, the EPA assumes that the nine EGUs retiring in 2029 would already be able to retire without making new investments under this rule, as these facilities could obtain a ''no later than'' date for the final limitations in this rule

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from their permitting authority as late as December 31, 2029. In particular, the EPA notes that there is a cluster of announced retirements that tails off around 2034, with relatively few additional retirements in subsequent years until the 2039/2040 timeframe. These retirements have already been announced, planned for, and in some cases already approved by state and regional utility commissions or grid operators.

Some commenters expressed the view that the EPA had not considered reliance interests created by the 2020 rule and the EPA's decision to continue to implement that rule. The EPA disagrees. As discussed in previous sections, a facility cannot reasonably rely on the limitations established in a permit beyond the life of the permit itself, which is typically issued for five-year term, and the technology-forcing nature of the statute contemplates establishment and revision of limitations based on the best available technology reflecting currently available information. Nevertheless, as noted above, there are around 50 EGUs planning to permanently cease coal combustion between 2030 and 2034. The plants where these EGUs are located are in the process of installing or have recently installed new technologies under the 2020 rule, as the latest date for compliance in that rule is December 31, 2025. Without establishment of this subcategory, these plants could now be expected, under this rule, to potentially abandon parts of their 2020 treatment systems and install different treatment systems to comply with this 2024 rule, which has a compliance date of December 31, 2029, at the latest. These plants, in particular, have adopted certain strategies for an orderly transition to retirement or an alternate fuel source. The owners and operators of these plants have planned this transition taking into consideration effects on the broader grid and the reasonable useful life of recently installed or soon-to-be installed water pollution treatment equipment under the 2020 rule. Under these circumstances, the EPA does not view it as reasonable, in view of all the relevant considerations, to expect this group of plants to abandon prior installations under the 2020 rule and make additional upgrades under this 2024 rule, given the relatively short remaining useful life of the EGUs and treatment systems. The EPA notes, moreover, that plants installing and operating technologies to meet the 2020 limitations will achieve reductions of pollutants of concern in their wastewaters.

For CRL, it is also relevant to consider the remaining useful life of the WMU. As discussed earlier in this section, commenters recommended providing flexibility for landfills which were nearing retirement, as these landfills would be closed and generate a much smaller volume of CRL after retirement. Thus, instead of installing an oversized system to operate for potentially only a couple of years, a more tailored system could be installed to treat the smaller, post-closure flow.

*Non-water quality environmental impacts (including energy requirements).* The already planned retirements and fuel conversions of coal-fired EGUs discussed above would not only reduce or eliminate the water pollution associated with the continued operation of coal-fired EGUs, but it would also reduce or eliminate air pollution and solid waste generation. Electric utilities have an interest in continuing the planned, orderly transition of this cluster of EGUs in a way that achieves an adequate amortization period for the water pollution treatment technologies. Without subcategorization, this cluster of facilities may choose to extend the life of these EGUs in order to better amortize the costs of both the existing technologies as well as the new technologies that would otherwise be required by this final rule. If that were to happen, the reductions in air pollution and solid waste generation associated with the planned retirement or repowering of the EGU would be forgone, and the EPA finds these non-water quality environmental impacts weigh in favor of this subcategory.

In addition, ''energy requirements'' are an express non-water quality environmental impact that EPA must consider under the statute, and several commenters raised concerns regarding electric reliability. These commenters suggested that a subcategory was necessary to maintain reliability. As discussed above, the retirements of EGUs in this subcategory have already been announced, planned for, and in some cases already approved by state and regional utility commissions or grid operators. The Agency finds that the creation of this subcategory provides flexibility for the orderly retirement or fuel conversion of coal-fired EGUs in a way that helps ensure grid reliability, as it allows plants to continue as planned while meeting the 2020 limitations. This provides additional support for this subcategory.

*Cost.* The EPA also notes that ''cost' is a factor that EPA must consider under CWA section 304(b), and, while not a primary basis, this factor provides additional support for this subcategory. Looking at the EGUs permanently ceasing coal combustion by December 31, 2034, absent the new subcategory, these EGUs would have additional capital costs of $708M and additional O&M costs of $93.0M. Given the short remaining useful life of the EGUs and associated wastewater treatment equipment, facilities with these EGUs would have fewer years of remaining life over which to amortize these costs, and thus the costs would be higher per MWh than the costs per MWh for EGUs not permanently ceasing coal combustion by 2034. This is especially true of plants that might not install the 2024 technologies until the latest compliance date of December 31, 2029. The EPA analyzed these costs in the 2020 rule with respect to the permanent cessation of coal by 2028 subcategory and similarly found unreasonably higher costs for that subcategory.

*Selection of 2034 date.* While the EPA proposed a permanent cessation of coal combustion date of December 31, 2032, several commenters advocated for different dates as early as 2030 and as late as 2040. The record discussed above does not provide a clear delineation for where such a cutoff should be placed; however, after careful consideration of the information in the record, the EPA finds that selecting a permanent cessation of coal combustion date of December 31, 2034, to be a reasonable way to account for the interests described above while still furthering the CWA's goals. First, as discussed above, there is a cluster of retirements occurring from 2030 to 2034. Relatively few additional EGUs would qualify for the subcategory if the date were placed a year or two further into the future, but many EGUs would be excluded if the date were kept at 2032 or moved even earlier as some commenters suggested. Furthermore, cost per MWh becomes greater as the amortization period of new equipment is shortened. An effective date for the final rule in 2024 and a ''no later than'' date of December 31, 2029, means that plants with retirements or fuel conversions in the 2030 to 2034 cluster would amortize costs over a period of several months to at most, 10 years. Finally, the use of December 31, 2034, would create parity for facilities regardless of where they were in their permit cycle. Since the 5-year permit cycle after the effective date of this rule would go from 2024 to 2029, one more 5-year permit cycle after that ends in 2034.

Finally, the EPA has considered how the requirements in this rule interact



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with the requirements in the CAA section 111 rule. One of the frequent comments received during the public comment period on the proposed ELG was that this rule and the CAA section 111 rule should be harmonized. Commenters argued that harmonization may consist of several aspects, including aligning compliance dates, aligning subcategories and other flexibilities, and aligning reporting and recordkeeping requirements. In the context of a subcategory for the permanent cessation of coal combustion, the EPA finds that the subcategory discussed here creates sufficient space for the flexibilities under the CAA section 111 rule to be utilized as appropriate.

As described in section IV.E.2 of this preamble, the final CAA section 111 rule consists of only two coal-fired EGU subcategories, and no longer has subcategories for EGUs retiring by 2032 or 2034 as were in the proposed CAA section 111 rule. Instead, the final CAA section 111 rule includes site-specific flexibilities to ensure reliability. While it is not always possible or necessary to harmonize the CAA and CWA requirements due to the different means by which flexibilities are implemented under the two statutes, EPA has provided flexibility under the ELG which would reasonably allow for the use of the site-specific flexibilities of the CAA section 111 rule. Specifically, since the two coal-fired EGU subcategories in the CAA section 111 final rule have compliance dates of January 1, 2030, and January 1, 2032, the use of the site-specific flexibilities tied to reliability would necessarily mean that some EGUs could retire after those dates with less stringent or delayed standards. Thus, the additional time provided by a 2034 permanent cessation of coal combustion date in the final ELG allows time for the corresponding site-specific flexibilities in the CAA 111 rule to be utilized.

While harmonization with the CAA section 111 rule supports the finding that this subcategory is appropriate, it is the EPA's intent that this new permanent cessation of coal combustion subcategory be retained even if the final CAA section 111 rule is not in effect. The EPA finds that, even in the absence of the CAA 111 rule, the other statutory factors of age, non-water quality environmental impacts, and cost are sufficient, either alone (save for cost) or together, to support the subcategory for EGUs permanently ceasing coal combustion by 2034.

b. The EPA is establishing BAT limitations for EGUs in this subcategory based on the currently applicable BAT technology bases for FGD wastewater, BA transport water, and CRL during the continued combustion of coal.

The EPA finds that the 2020 rule BAT technologies that formed the bases for the generally applicable limitations for FGD wastewater and BA transport water, as well as the BAT technologies that formed the bases for limitations in the high FGD flow subcategory and in the LUEGU subcategory, are available, are economically achievable, and have acceptable non-water quality environmental impacts, as explained in the 2020 rule and further confirmed by analyses in this rule. EPA is, therefore, identifying them as the BAT technology bases for FGD wastewater and BA transport water for EGUs in this subcategory.[131] The EPA is also declining to establish BAT limitations on CRL prior to permanently ceasing combustion of coal. The effect of EPA declining to establish BAT limitations for CRL discharged from EGUs in this subcategory prior to permanently ceasing coal combustion is that permitting authorities will continue to establish technology-based effluent limitations using their BPJ. Because the limitations are required to be derived on a case-by-case basis, taking into account the requisite statutory factors and applying them to the circumstances of a given plant, these limitations would by definition be technologically available and economically achievable and have acceptable non-water quality environmental impacts where the permitting authority supports in the record of the permit that such is the case.

The EPA rejects more stringent technologies, such as zero-discharge systems, for FGD wastewater, BA transport water, or CRL in this subcategory before the permanent cessation of coal combustion. Zero-discharge requirements for this subcategory may not allow electric utilities with a limited remaining useful life to continue their ongoing, approved plans for an organized phasing out of EGUs that are no longer economical, in favor of more efficient, newly constructed generating stations. This concern is reduced by maintaining the currently applicable BAT limitations for this subcategory.

While the previous basis is sufficient to reject technologies that would result in more stringent limitations, the EPA notes that limitations based on such technologies as zero-discharge systems would impose greater costs per MWh on this subcategory of EGUs, given their limited remaining useful life. This provides additional support for rejecting more stringent limitations. Retaining the currently applicable BAT for this subcategory alleviates the choice for these plants to either pass on the greater capital costs per MWh of zero-discharge systems over a shorter remaining useful life or risk the possibility that post-retirement rate recovery would be denied for the significant capital and operating costs associated with the final rule. In addition, with respect to CRL, requiring across-the-board BAT limitations before permanent cessation of coal combustion could lead to individual facilities experiencing disparate costs not only because of the short remaining useful life of the facility, but also because of the short remaining useful life of the waste management unit. The record indicates that the volumes of CRL generated by a retired landfill are approximately an order of magnitude lower than the volumes of CRL generated by an operating landfill. One of the primary inputs to EPA's cost model is the volume treated. Here, if the EPA mandated categorical limitations based on a treatment technology prior to ceasing combustion of coal, a facility would need to size that technology to treat the flows of a fully operating landfill. However, about 90 percent of that system would go idle only a few years later and remain idle into perpetuity. Thus, these capital investments would result in greater costs per MWh sold compared to the costs described to treat CRL discharges at plants continuing operations (see section VII.B.3 of this preamble). CRL costs for a post-retirement-sized system would be lower in absolute terms, but also lower in light of these costs being incurred later. This finding does not conflict with the EPA's finding that case-by-case BAT limitations developed using a permitting authority's BPJ are available, are economically achievable, and have acceptable non-water quality environmental impacts because a permitting authority can consider site-specific information, such as the availability of other existing wastewater treatment systems at the plant to accommodate the volumes of CRL generated.[132]

[131] In identifying the BAT technology bases of the 2020 rule as BAT for the new permanent cessation of coal combustion by 2034 subcategory, the EPA is excluding the technology bases for EGUs permanently ceasing coal combustion by 2028. These EGUs can already seek an ''as soon as possible'' date for the new 2024 limitations later than the December 31, 2028, date for the permanent cessation of coal combustion.

[132] For example, if an FGD wastewater treatment system already in place at a facility was under-



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The EPA also rejects surface impoundments as BAT for FGD wastewater, BA transport water or CRL in this subcategory before the permanent cessation of coal combustion. Some commenters encouraged the EPA to finalize either a new or an extended permanent cessation of coal subcategory with surface impoundments as BAT. While EPA has today reaffirmed its 2020 rule findings that surface impoundments are BAT for the subcategory of EGUs permanently ceasing coal combustion by 2028 in the section above, part of those 2020 rule findings included the finding that more stringent technologies *were* BAT for EGUs operating beyond December 31, 2028, because those technologies are available, are economically achievable, and have acceptable non-water quality environmental impacts. The EPA received several comments in the record from utilities that have done as the EPA indicated at proposal: they have continued to move forward with implementation of the 2020 rule. These utilities discussed the significant costs associated with interim steps toward implementation such as engineering design, bidding, contracting for systems, and commencing construction. EPA acknowledges these expenditures. To the extent that costs have already been incurred, these are sunk costs that cannot be recovered, and thus the marginal impact of the rule would not interfere with power plants' already approved, ongoing plans to transition to retirement or repowering or impose disparate costs. While EPA expects that most costs will already have been incurred, the 2020 rule limitations have a ''no later than'' date of December 31, 2025, rather than this rule's ''no later than'' date of December 31, 2029, for the new, more stringent BAT limitations. Thus, even in the rare case that a facility has failed to diligently pursue treatment that would meet the 2020 rule limitations, such a facility will have an additional four years to amortize any remaining capital costs of their treatment systems before ceasing coal combustion in 2034 as compared to the amount of time they would have to amortize the capital costs of treatments systems to meet this final rule's more stringent BAT limitations. Therefore, it is less likely that the investments made to comply with the 2020 rule would interfere with the orderly transition of generating capacity for those EGUs in this subcategory.

Moreover, the EPA finds that the costs to EGUs in this subcategory for meeting the currently applicable FGD wastewater and BA transport water limitations as compared to EGUs that are not permanently ceasing coal combustion by 2034 do not justify rejecting the 2020 rule limitations in favor of BAT limitations based on surface impoundments, especially where there are more stringent technologies capable of greater pollutant discharge reduction as described above that are available, are achievable, and have acceptable non-water quality environmental impacts. This finding is further confirmed in the EPA's evaluation of the 2020 rule costs in the baseline and policy runs of IPM, both of which demonstrate that the 2020 rule limitations continue to be economically achievable. The EPA's decision to continue to require permitting authorities to develop limitations on CRL discharges is also consistent with the Fifth Circuit's decision in *Southwestern Electric Power Co.* v. *EPA.* There, the Court vacated BAT limitations for CRL based on surface impoundments, citing the EPA's statements in the record that surface impoundments do not adequately control dissolved metals and the fact that there are more stringent technologies than surface impoundments that are available to control discharges of CRL. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1029–1030. Reserving BAT limitations for CRL discharged before an EGU permanently ceases coal combustion in this subcategory allows for the permitting authority to impose more stringent technologies as appropriate.

c. For EGUs in this subcategory, BAT limitations for CRL after the EGU permanently ceases combustion of coal are based on chemical precipitation.

The EPA expects that, unlike FGD wastewater and BA transport water, CRL will continue to be discharged even after a plant permanently ceases coal combustion. For EGUs in this subcategory, the EPA is establishing nationwide limitations for CRL on mercury and arsenic based on chemical precipitation after permanently ceasing combustion of coal. Specifically, the BAT technology basis after permanently ceasing coal combustion is a chemical precipitation system that employs hydroxide precipitation, sulfide precipitation (organosulfide), and iron coprecipitation.

With respect to BAT limitations after permanent cessation of coal combustion, the rule record is extensive in support of the EPA's finding that chemical precipitation is technologically available for the treatment of arsenic and mercury in CRL. As far back as the 2015 rule, the EPA found that four plants operated chemical precipitation systems on their CRL and, in fact, established NSPS for CRL based on chemical precipitation systems.[133] The EPA also found that chemical precipitation was in use on FGD wastewater (which EPA found was characteristically similar to CRL), metal products and machinery plants, iron and steel manufacturers, metal finishers, and mining operations (including coal mines).[134] All of these uses have demonstrated the ability of chemical precipitation technology to remove arsenic and mercury.[135]

One commenter suggested that chemical precipitation does not treat dissolved arsenic concentrations. This comment contradicts what is known about chemical precipitation. In the 2015 rule record, the EPA explained that chemical precipitation systems typically use pH adjustment to make soluble forms of pollutants insoluble. The EPA found that most systems operate with three chemicals that are added in one tank or in separate tanks, depending on the pH at which individual metals will settle out.[136] Thus, while plants may need to adjust systems until it is optimized for the specific CRL and target pollutant removals, the EPA sees nothing to indicate that dissolved arsenic concentrations are not treatable just because they are dissolved. The pre- and post-treatment dissolved arsenic data the commenter refers to are a subset of total arsenic (not just dissolved arsenic) that the EPA noted in 2015 was very low (near or below the limit of quantification). The fact that some data points are above the limit of quantitation does not change the fact that these are still very low dissolved arsenic numbers that demonstrate the ability of the technology to meet the established limitations. The fact that the technology did not continue to remove arsenic below the treatment levels that the EPA established in 2015 does not negate the fact that this same data

utilized, the permitting authority might find that treatment with that system is available, economically achievable, and has acceptable non-water quality environmental impacts for that facility.

[133] U.S. EPA (Environmental Protection Agency). 2015. *Technical Development Document for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category.* September. Washington, DC 20460. EPA–821–R–15–007. Available online at: *https://www.epa.gov/sites/default/files/2015-10/documents/steam-electric-tdd_10-21-15.pdf.*

[134] *Id.*

[135] *Id.*

[136] *Id.*



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demonstrates the technology *does* remove arsenic down to that limit.

Another commenter referenced 2010 survey data as showing elevated levels of iron, aluminum, and manganese in CRL from landfills where coal-handling byproducts were also disposed, which this commenter suggested would make treatment more complex. The commenter did not claim that these elevated influent concentrations make the waste untreatable through chemical precipitation, only that there may be additional solid wastes or a need for multiple treatment vessels. Without more information, the EPA has no reason to conclude that chemical precipitation would not work as intended in these scenarios.[137]

The EPA finds that BAT limitations based on chemical precipitation for EGUs discharging CRL after permanently ceasing coal combustion in this subcategory are economically achievable based on the results of IPM modeling, as explained in sections VII.F and VIII.

The EPA finds that BAT limitations based on chemical precipitation for EGUs discharging CRL after permanently ceasing coal combustion in this subcategory have acceptable non-water quality environmental impacts as discussed in sections VII.G and X.

*For a further discussion of the availability timing of these limitations, see section VII.E of this preamble.*

d. The EPA rejects surface impoundments as BAT for CRL after permanent cessation of coal combustion in this subcategory.

The EPA finds that surface impoundments are not BAT for CRL after permanent cessation of coal combustion for EGUs in this subcategory. The record shows that chemical precipitation is available, is economically achievable, and has acceptable non-water quality environmental impacts for treatment of CRL discharges after the permanent cessation of coal combustion. Moreover, chemical precipitation removes more pollutants than surface impoundments, which better achieves the BAT requirement of making reasonable further progress toward the CWA's goals. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1003, 1006 (citing *Nat'l Crushed Stone* v. *EPA,* 449 U.S. at 75).

e. The EPA rejects more stringent technologies as BAT for CRL after permanent cessation of coal combustion in this subcategory.

The EPA finds that more stringent technologies are not BAT for CRL after permanent cessation of coal combustion for EGUs in this subcategory based on the statutory factors of age and cost, as well as given certain information gaps in the record. Specifically, the EPA finds that more stringent technologies are not commensurate with the age of the facility being in a retired status, which would lead to unacceptably higher capital costs that can no longer be spread over electricity sales.

Concerning CRL generated after retirement, the EPA notes that CRL will continue to be generated into perpetuity without any associated revenue stream tied to ongoing coal combustion, as several commenters pointed out.[138] This differs substantially from scenarios involved in a typical ELG, for which the EPA conducts a screening economic analysis that compares costs to revenues at the facility level in addition to the owner level.[139] The EPA notes that this results not in a standard disparate cost, but rather an overall disparate circumstance. Since this unique scenario does not often play out in ELGs, the EPA does not have examples to draw from in evaluating economic achievability.

Given this unique aspect of this ELG, the EPA notes that any treatment system built to operate only after the permanent cessation of coal combustion will necessarily experience costs in a differing circumstance when compared to the costs recovered via ongoing electricity sales by EGUs not in this subcategory. For CRL that is not otherwise subcategorized in this rule, the EPA is requiring limitations based on zero-discharge systems during operations to continue to apply even after retirement. These EGUs will continue to combust coal beyond 2034, so systems will already be partially or fully paid for with rate recovery from electricity sales during the active phase of the EGU. Thus, the marginal cost of continuing to use such an existing treatment system are limited to O&M costs, and thus would not result in capital costs being incurred under the disparate circumstance of retired coal-fired EGUs.

As this discussion demonstrates, the selected BAT basis, chemical precipitation, already imposes costs in a disparate circumstance compared to EGUs not in this subcategory. Compared to chemical precipitation systems, however, biological and zero-discharge systems worsen already existing situational revenue disparities based on the already passed retirement age for these EGUs when compared to the rest of the industrial category. Both chemical precipitation plus biological treatment systems and zero-discharge systems typically have capital costs about double the capital costs of chemical precipitation systems alone.[140] The EPA finds that the increased costs of these more stringent technologies renders them unacceptable in light of the post-retirement age of the EGUs to which they would apply. The EPA intends the age, cost, and economic achievability rationale discussed here is unique to the small number of industry-wide discharges at retired facilities with no revenue such as the landfill industrial point source category: it thus will not form a precedent for evaluating costs and economic achievability at the vast majority of facilities which continue to operate and have active revenue streams.

The EPA also considered the availability of biological treatment systems for CRL at closed landfills. Some commenters raised concerns that biological treatment systems could not handle low or fluctuating flows associated with CRL. The EPA agrees, in part, with these comments. Biological treatment systems require a minimum amount of feed source for the microorganisms to survive. While facilities have demonstrated the ability to supplement these nutrients in the FGD wastewater context, CRL generated after a landfill is closed is precipitation-dependent and may not be as easy to

[137] The EPA also notes that, should a facility with such a landfill generate CRL that is sufficiently different from the CRL evaluated in the record, the facility may be able to apply for a Fundamentally Different Factors variance.

[138] The EPA acknowledges that this subcategory also applies to fuel conversions. The EPA considered the fact that this subset of EGUs within this subcategory would have a future revenue stream, unlike EGUs that permanently retire. However, were the EPA to require more stringent treatment at this subset of EGUs, the result could be for a facility converting to natural gas (for example) to instead construct its replacement gas-fired capacity on an immediately adjacent greenfield to avoid the additional costs of treatment. This is a perverse incentive because it could implicate the development of additional land, perhaps even a greenfield, and construction of new transmission lines. These are adverse non-water quality environmental impacts that the EPA finds unacceptable, and it is thus declining to treat this subset differently from retiring EGUs. The EPA further notes that this outcome would result in additional costs of replacement capacity without achieving any additional pollutant discharge reductions.

[139] While The EPA has performed that comparison here using the operating revenues prior to the cessation of coal combustion, the Agency has already found that subcategorization is warranted for a number of reasons and justified retaining the current requirement that case-by-case BPJ determinations be made by the permitting authority in controlling CRL discharges.

[140] For biological treatment cost comparisons, the EPA is using the 2020 rule record with respect to FGD wastewater.



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forecast as FGD wastewater flows. Thus, even if facilities provided a supplemental feed source, it would be possible to develop either too large or too small a bacterial colony. The EPA's record demonstrates that hydrogen sulfide formation can result from biological treatment when oxidation reduction potential (ORP) is too low. Sulfide produced in the system readily forms metal complexes with other metals and precipitate out of the FGD wastewater. During backwashing events, the system releases any trapped gasses generated in the process, including hydrogen sulfide (DCN SE02955). The EPA notes that large concentrations of sulfides are only a problem if the ORP goes too low for a long time.[141] The EPA's record lacks evidence of a biological treatment system operating on a retired landfill; therefore, no information is available on whether other issues related to biological treatment of CRL from retired landfills affect ORP or hydrogen sulfide production. In the absence of any record evidence of a biological treatment system operating on a retired landfill, the EPA concludes that these concerns, together with the age of the EGUs being in a retired status and the cost considerations regarding biological treatment discussed above, justify rejecting this technology as BAT for CRL post-cessation of coal combustion.

Zero-discharge systems can adapt to changes in flow rates more easily than biological treatment. Nevertheless, as with biological treatment, the record does not contain any information on zero-discharge systems operating on CRL or non-CCR landfill leachate after a facility has retired. The examples EPA has demonstrating availability consist of co-treatment with FGD wastewater or treatment of non-CCR landfill leachate during operations. During the development of this rule, the EPA sought information on treatment of CRL or non-CCR landfill leachate through vendors of applicable systems, but there were no known installations on retired landfills were indicated. While it may be possible for the EPA to establish zero-discharge systems even in record absence of operations post-cessation of coal combustion, when this information gap is combined with the age and cost considerations discussed above, it leads the EPA to conclude that zero-discharge systems do not represent BAT for post-cessation of coal combustion discharges of CRL in this subcategory.

[141] For FGD wastewater, EPA recommends ORP monitors to avoid these scenarios.

f. The EPA is not including legacy wastewater in the permanent cessation of coal combustion subcategory.

The EPA received some comments suggesting that any new permanent cessation of coal combustion subcategory should cover discharges of legacy wastewater from EGUs in the subcategory. These comments did not provide information demonstrating that legacy wastewater discharges are tied to the marginal operating costs of steam EGUs. Rather, the record demonstrates that legacy wastewater discharges will primarily continue to occur through the dewatering of surface impoundments closing under the CCR regulations. Since treatment of legacy wastewater will occur whether an EGU continues to burn coal or not, investments made under this rule do not have the potential to interfere with the orderly transition of generating capacity, as they would be incurred even if the EGU had ceased operations years ago. Moreover, because the costs must be incurred whether or not the EGU closes, these costs do not differ based on the remaining useful life of the EGUs. Since the EPA does not find that the statutory factors discussed above as the bases to establish this subcategory would apply to legacy wastewater, the EPA is not subcategorizing legacy wastewater based on the permanent cessation of coal combustion. Instead, the case-by-case limitations described in section VII.B.4 of this preamble will continue to apply.

g. The EPA is finalizing post-coal combustion cessation zero-discharge limitations for EGUs in this subcategory to avoid circumvention.

As with the permanent cessation of coal combustion by 2028 subcategory, the EPA proposed to include zero-discharge limitations applicable after the permanent cessation of coal combustion date for this subcategory, December 31, 2034. The EPA received comments that opposed the finalization of this subcategory, but in the alternative these commenters advocated for post-coal combustion cessation limitations to help ensure that the cease combustion of coal criterion for the subcategory is met. EPA also received more general comments as described in section VII.C.3 of this preamble.

After considering these comments, and for the same reasons set forth in section VII.C.3 of this preamble, the EPA is finalizing a tiered set of zero-discharge BAT limitations that apply following the cease combustion of coal by 2034 date, as follows:

- The first tier of these limitations is composed of zero-discharge limitations for FGD wastewater and BA transport water after April 30, 2035.[142] These limitations would apply if the EGU has in fact permanently ceased coal combustion as it represented it would. As suggested in the comments, this is 120 days after the latest permanent cessation of coal combustion date, allowing for facilities to complete any necessary residual decommissioning discharges.[143]
- The second tier is composed of zero-discharge limitations for the same wastewaters, as well as CRL, after December 31, 2034. If a plant fails to cease combustion of coal by 2034 (as it represented it would) for any reason other than those specified in § 423.18, these zero-discharge limitations would automatically apply.

As explained in section VII.C.3 of this preamble, the EPA finds that together, the zero-discharge limitations and reporting and recordkeeping requirements are sufficient to ensure that facilities do not unfairly benefit by continuing to discharge after the subcategory's permanent cessation of coal combustion date.

5. Discharges of Unmanaged CRL

The EPA is establishing a new subcategory for discharges of unmanaged CRL, which EPA is defining in this rule to mean the following: (1) discharges of CRL that the permitting authority determines are the FEDD to a WOTUS through groundwater or (2) discharges of CRL that has leached from a waste management unit into the subsurface and mixed with groundwater before being captured and pumped to the surface for discharge directly to a WOTUS.[144] After evaluating public comments, and in light of the factors specified in CWA section 304(b)(2)(B), the EPA finds that the record demonstrates such a subcategory is warranted based on the unacceptably high costs to the plants in this subcategory associated with zero-discharge requirements, which would

[142] The EPA is also finalizing requirements that the BAT limitations for CRL in this subcategory be met no later than April 30, 2035, to align with the dates in this backstop provision. For further discussion, see section VII.E of this preamble.

[143] The EPA notes that these do not include discharges of legacy wastewaters from surface impoundments closing under the CCR rule, which are covered by different regulatory provisions.

[144] The latter type of unmanaged CRL is no different than the former except that it is already being collected for treatment and discharge as of the effective date of the final rule. Since migration from the waste management unit and mixing with groundwater occurs in both cases, the characteristics and volumes of these two types of unmanaged CRL are expected to be consistent and, therefore, have been modeled consistently for the cost analysis discussed in section VIII.A of this preamble.



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otherwise apply to CRL discharges under this rule (see discussion below). For units with discharges in this subcategory, The EPA is finalizing the proposed mercury and arsenic limitations, based on chemical precipitation, which the record shows are available, are economically achievable, and have acceptable non-water quality environmental impacts. A discussion of the selected technology basis, as well as rejected technology bases, appears below, following two subsections that address several overarching comments the EPA received about discharges in this subcategory.

The EPA solicited comment on an option to subcategorize EGUs with discharges through groundwater. Leachate is typically managed through the use of a liner and leachate collection system. In the context of municipal solid waste landfills and hazardous waste landfills, a leachate collection system is designed to maintain less than a 30-centimeter depth over the liner.[145] [146] As stated in *Solid Waste Disposal Facility Criteria Technical Manual:*

> The primary function of the leachate collection system is to collect and convey leachate out of the landfill unit and to control the depth of the leachate above the liner. The leachate collection system (LCS) should be designed to meet the regulatory performance standard of maintaining less than 30 cm (12 inches) depth of leachate, or ''head,'' above the liner. The 30-cm head allowance is a design standard and the Agency recognizes that this design standard may be exceeded for relatively short periods of time during the active life of the unit. Flow of leachate through imperfections in the liner system increases with an increase in leachate head above the liner. Maintaining a low leachate level above the liner helps to improve the performance of the composite liner.[147]

In contrast, many CCR landfills and surface impoundments have unmanaged CRL, which is allowed to percolate out of the WMU and into the subsurface and this subcategory applies to such unmanaged CRL. Specifically, the final subcategory covers such discharges of CRL that are determined, on a case-by-case, site-specific basis by the permitting authority to constitute the FEDD to a WOTUS. The EPA is also including certain direct discharges of CRL in this subcategory—in particular, discharges of CRL that has leached from a waste management unit into the subsurface and mixed with groundwater before being captured and pumped to the surface—because the EPA is aware that some plants could independently choose to pump and treat groundwater as a result of the CCR regulations, sometimes before wastewater from the impoundments traveling through groundwater has reached a WOTUS and become the FEDD to a WOTUS. This subcategory applies to any direct discharges of such CRL to a WOTUS. Both types of unmanaged CRL could occur at a plant with an unlined WMU, and both present the same basic issues in terms of costs for treatment, given the volumes of wastewater that would need to be treated to meet BAT limitations for unmanaged CRL.

a. The EPA has CWA authority to regulate certain discharges through groundwater from landfills and surface impoundments.

The EPA proposed that CRL limitations would apply not only to traditional end-of-pipe discharges, but also to discharges of CRL through groundwater, which a permitting authority deems to be the FEDD from a point source to a WOTUS. EPA received many comments related to the discharge of CRL through groundwater. Comments expressed varying views as to whether CRL discharged through groundwater from landfills and surface impoundments would be the FEDD.

As a threshold matter, as it explained in the proposed rule, the EPA is not determining that all discharges through groundwater from landfills and surface impoundments are the FEDD from a point source to a WOTUS. Rather, in this rule, the EPA is establishing limitations that apply to any discharge of this kind that a permitting authority or facility owner or operator determines to be the FEDD from a point source to a WOTUS, and thus requires an NPDES permit. The threshold standard for the ''functional equivalence'' determination is outside the scope of this rule.

Some comments argue that the EPA lacks the legal authority to regulate *any* leachate that reaches navigable waters through groundwater from landfills or surface impoundments because landfills and surface impoundments are not point sources. These comments cite two cases in support of this position. *See Sierra Club* v. *Va. Elec. & Power Co.,* 903 F.3d 403 (4th Cir. 2018); *Ky. Waterways All. V. Ky, Utils. Co.,* 905 F.3d 925 (6th Cir. 2018). Related comments suggest that, in *County of Maui,* there were unique facts regarding the existence of a point source that are not applicable in the CRL context.

In response to these comments, the EPA reaffirms its longstanding position, which is consistent with the *Maui* decision: a point source determination is case-specific, and some landfills and surface impoundments may likely meet the definition of point sources under the CWA. ''The term 'point source' means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.'' 33 U.S.C. 1362(14). At least some of the landfills and surface impoundments at steam electric facilities may fit this definition, in that they are ''discernible, confined, and discrete conveyances.'' A permitting authority may also deem surface impoundments at these facilities to be analogous to ''wells'' or ''containers'' some of the illustrative examples in the definition. As the Fifth Circuit noted in *Southwestern Elec. Power Co.* v. *EPA,* where leachate occurs at a steam electric power plant, it is typically collected and transported to an impoundment, and ''[u]nlined landfills or impoundments simply 'allow the leachate to potentially migrate to nearby ground waters, drinking water wells, or surface waters.' '' 920 F.3d at 1011 (citing the 2015 rule preamble); *id.* at 1029 (noting that the EPA's environmental assessment document reports that ''[c]ombustion residual leachate can migrate from the site in the ground water at concentrations that could contaminate public or private drinking water wells and surface waters, even years following disposal of combustion residuals'') (citation omitted). And the Fifth Circuit had earlier addressed the question of whether sump pits into which miners channeled contaminated runoff and which sometimes overflowed to ''waters of the United States'' were point sources, holding on these facts that ''[g]ravity flow, resulting in a discharge of a pollutant into a navigable water, may be a point source discharge if the miner at least initially collected or channeled the water and other materials.'' *Sierra Club* v. *Abston Construction Co., Inc.,* 620 F.2d 41, 45 (5th Cir. 1980). Under this rule, permitting authorities will continue to determine whether a particular landfill or surface impoundment meets the definition of point source, and then they will determine whether or not that point source has a discharge of pollutants subject to the CWA.

To the extent that the Fourth Circuit's decision in *Sierra Club* v. *Va. Elec. & Power Co.* held that an impoundment can never be a ''point source'' under the CWA, the Supreme Court's decision in

[145] 40 CFR 258.40(a)(2).

[146] 40 CFR 264.251(a)(2).

[147] U.S. EPA (Environmental Protection Agency). 1993. *Solid Waste Disposal Facility Criteria Technical Manual.* November. EPA530–R–93–017.



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*Maui* calls that holding into question.[148] While commenters correctly point out that the parties in *Maui* conceded that there was a point source, so the issue was not directly before the Court, the injection wells at issue in *Maui* are factually very similar to some EGU surface impoundments. The Supreme Court in *Maui* described the facts of the case as a wastewater reclamation facility that ''collects sewage from the surrounding area, partially treats it, and pumps the treated water through four wells hundreds of feet underground. This effluent, amounting to about 4 million gallons each day, then travels a further half mile or so, through groundwater, to the ocean.'' *County of Maui,* 590 U.S. at 171. Furthermore, the Supreme Court rejected EPA's argument that ''all releases of pollutants to groundwater'' are excluded from the scope of the permitting program, ''even where pollutants are conveyed to jurisdictional surface waters via groundwater,'' in part because of the definition of ''point source,'' concluding:

> It is difficult to reconcile EPA's interpretation with the statute's inclusion of ''wells'' in the definition of ''point source,'' for wells most ordinarily would discharge pollutants through groundwater. And it is difficult to reconcile EPA's interpretation with the statutory provisions that allow EPA to delegate its permitting authority to a State only if the State (among other things) provides ''adequate authority'' to ''control the disposal of pollutants into wells.'' § 402(b), 86 Stat. 881. What need would there be for such a proviso if the Federal permitting program the State replaces did not include such discharges (from wells through groundwater) in the first place?

*County of Maui,* 590 U.S. at 181.

Similarly, some EGU impoundments, like wells, may discharge through groundwater to a WOTUS in a manner that is the FEDD. For example, suppose leachate from a coal-fired power plant is collected and contained in a waterfront surface impoundment dug below the groundwater table, and the leachate flows through the groundwater into the nearby ''water of the United States.'' Excluding such a discharge from CWA permitting requirements would create a loophole in the Act's coverage similar to the one that concerned the Supreme Court in *Maui:* ''We do not see how Congress could have intended to create such a large and obvious loophole in one of the key regulatory innovations of the Clean Water Act.'' *County of Maui,* 590 U.S. at 178–79. *Cf. California ex rel. State Water Resources Control Bd.,* 426 U.S., at 202–204 (basic purpose of Clean Water Act is to regulate pollution at its source); *The Emily,* 9 Wheat. 381, 390 (1824) (rejecting an interpretation that would facilitate ''evasion of the law'').

Thus, to the extent that landfills, surface impoundments, or other features that could be considered point sources and from which FEDDs of CRL occur to a WOTUS, this rule informs the permitting authority of the appropriate technology-based effluent limitations that would apply. At this time, the EPA cannot agree with commenters who presume to know the extent of such potential discharges. The EPA need not speculate as to the myriad of possible scenarios. Determining which impoundments and landfills meet the definition of ''point source'' is a task for permitting authorities and outside the scope of this rulemaking. Instead, the EPA points out that, based on current law and facts as they appear in the record, the CRL limitations the EPA is promulgating will apply to *some* discharges from *some* impoundments and landfills—*i.e.,* those that a permitting authority determines to be the FEDD from a point source to a WOTUS.

b. Potential interactions with RCRA and the CCR regulations do not justify rejection of a nationwide BAT for certain CRL discharges through groundwater.

With respect to RCRA and the CCR regulations, some commenters stated that regulation of CRL discharged through groundwater would ''nullify'' the CCR regulations in violation of RCRA's industrial wastewater exclusion or anti-duplication provision. Other commenters argued that imposing any CWA requirements on FEDDs of CRL could not be harmonized with RCRA requirements found in the CCR regulations and recommended that the EPA leave such discharges to be managed by the CCR program and states. Each of these comments is addressed in a separate discussion below.

*RCRA industrial wastewater exclusion.* The EPA disagrees with commenters stating that establishing BAT limitations for certain CRL discharges through groundwater would ''nullify'' the CCR regulations due to RCRA's industrial wastewater exclusion. At the outset, as explained above, this rule does not address the scope of the CWA, as it does not address which discharges may require an NPDES permit, but rather it establishes appropriate technology-based limitations to include in such a permit. Since this rule does not expand CWA jurisdiction over any discharges—in particular, it does not require CWA regulation of discharges, such as certain CRL discharges through groundwater, that would not already be regulated by the CWA—it does not alter the existing RCRA framework that accounts for the CWA.

The EPA also disagrees with commenters that regulation of certain CRL discharges through groundwater would block regulation by the CCR regulations. RCRA excludes from the definition of ''solid waste'' any ''industrial discharges which are point sources subject to permits'' under the CWA. 42 U.S.C. 6903(27). As the EPA has explained before, this RCRA exclusion applies to discharges to jurisdictional waters under the CWA, and not to any activity, including groundwater releases or contaminant migration, that occurs prior to that point. The EPA explained this in more detail in a ''Question and Answer'' on the EPA's website:

> Does the issuance of an NPDES permit covering discharges from a CCR unit exempt the owner/operator from any requirements under the CCR rule?
>
> No, discharges covered by an NPDES permit are not a ''solid waste'' pursuant to RCRA section 1004(27). The RCRA exclusion only applies to ''industrial discharges that are point sources subject to permits,'' *i.e.,* to the discharges to jurisdictional waters, and not to any activity, including groundwater releases or contaminant migration, that occurs prior to that point. See title 40 of the Code of Federal Regulations (CFR) 261.4(a)(2) (''This exclusion applies only to the actual point source discharge. It does not exclude industrial wastewaters while they are being collected, stored or treated before discharge.''). For purposes of the RCRA exclusion, EPA considers the ''actual point source discharge'' to be the point at which a discharge reaches the jurisdictional waters, and not in the groundwater or otherwise prior to the jurisdictional water. Thus, the issuance of an NPDES permit for discharges from a facility's CCR surface impoundment would not exempt the owner/operator from any requirements under the CCR rule applicable to the disposal unit, such as the requirements to ensure the structural stability of the unit, to clean up all releases to the aquifer, and to meet all closure standards.[149]

*Compare* RCRA's ''solid waste'' definition, 42 U.S.C. 6903(27), with the CWA's definition of the ''discharge of pollutants,'' 33 U.S.C. 1362(12) (''any addition of any pollutant to navigable waters from any point source''). Until the point at which the discharge reaches

[148] The decision in *Ky. Waterways All.* v. *Ky, Utils. Co.,* 905 F.3d 925, cited by some commenters did not address the question of whether an impoundment is a point source but rather held that ''The CWA does not impose liability on surface water pollution that comes by way of groundwater.'' The decision has been abrogated by *Maui.*

[149] Available online at: *https://www.epa.gov/coalash/relationship-between-resource-conservation-and-recovery-acts-coal-combustion-residuals-rule.*



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''navigable waters,'' any collection, storage, treatment, or even groundwater contamination is still subject to RCRA and the requirements of the CCR regulations.

*RCRA anti-duplication provision.* The EPA also disagrees with commenters who asserted that regulation of certain CRL discharges through groundwater would be inconsistent with or duplicative of regulation by the CCR regulations due to RCRA's anti-duplication provision. RCRA, by its terms, requires administration and enforcement that is ''not inconsistent'' with, among other Federal statutes, the CWA. 42 U.S.C. 6905(a). It further requires both integration and non-duplication with the CWA ''to the maximum extent *practicable.*'' 42 U.S.C. 6905(b) (emphasis added). The requirements do not mean there can be no overlap to accomplish the purposes of each statute.

Circuit courts have found several similar instances of RCRA and the CWA operating in tandem.[150] For example, in *Goldfarb* v. *Mayor and City Council of Baltimore,* 791 F.3d 500 (4th Cir. 2005), construction activities allegedly spread/worsened existing soil, water, and groundwater contamination. The defendants maintained their NPDES permit shielded them from RCRA liability because of RCRA's anti-duplication provision. The court rejected this contention, explaining:

> To be ''inconsistent'' for purposes of [RCRA's] § 6905(a), then, the CWA must require something fundamentally at odds with what RCRA would otherwise require . . . RCRA mandates which are just different, or even greater, than what the CWA requires, are not necessarily the equivalent of being ''inconsistent'' with the CWA. . . . It is not enough that the activity or substance is already regulated under the CWA; it must also be ''incompatible, incongruous, and inharmonious.'' . . . The district court's conclusion is thus built on the faulty premise that the CWA and RCRA cannot regulate the *same* activity under any circumstance.

*Goldfarb* v. *Mayor and City Council of Baltimore,* 791 F.3d at 505–06, 510. Similarly, *Ecological Rights Foundation* v. *Pacific Gas & Electric Co.,* 874 F.3d 1083 (9th Cir. 2017), involved an action against owners of mining activities that allegedly leached toxic substances into navigable waters. The court held that so long as RCRA's application is not ''inconsistent'' with the CWA, the anti-duplication provision is no bar to a RCRA action. *Id.* at 1089, 1095–97 (collecting cases and a Department of Justice Office of Legal Counsel opinion). It further held that the term ''inconsistent'' must be ''mutually repugnant or contradictory'' such that ''one implies abrogation or abandonment of the other.'' *Id.* at 1095 (citations omitted). The case expressly recognized that there can be overlap between these regulatory schemes. Since case law generally supports the operation of the CWA in tandem, not *in lieu* of RCRA, the EPA disagrees with commenters. *See also Chemical Waste Management* v. *EPA,* 976 F.2d 2, 23, 25 (D.C. Cir. 1992).

*Practical interaction of the CCR and ELG rules.* The EPA also disagrees with commenters who stated that imposing any CWA requirements on FEDDs of CRL could otherwise not be harmonized with RCRA requirements found in the CCR regulations. The RCRA CCR regulations, which post-date the CWA, were written with integration in mind. That is, 40 CFR 257.52(b) provides: ''Any CCR landfill, surface impoundment, or lateral expansion of a CCR unit continues to be subject to the requirements in §§ 257.3–1, 3–2, and 3–3.'' And 40 CFR 257.3–3(a) provides: ''For purposes of section 4004(a) of the [Resource Conservation and Recovery] Act, a facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES) under section 402 of the Clean Water Act, as amended.'' Critically, nothing in § 257.3–3(a) or other sections establish a RCRA permitting scheme for discharges to navigable waters, nor in any other ways contradicts the CWA's NPDES permit program. The CCR regulations generally, and § 257.3–3(a) specifically, leave the regulation of point source discharges to navigable waters to the CWA. The CCR regulations regulate the management of CCR to protect human health and the environment, including groundwater, from contamination associated with the mismanagement of these wastes. *See, e.g.,* 40 CFR 257.91 through 257.98. They do so because, among other important reasons, CCR is a potential source of contamination in wells used for drinking water.

Given the above, the EPA does not agree with commenters that establishing limitations for functionally equivalent CRL discharges through groundwater would conflict with the CCR regulations. Instead, the CCR regulations require CRL-contaminated groundwater to meet specific levels or to be cleaned up to those levels through corrective action. The EPA expects that in many cases this would require pump-and-treat operations.[151] To the extent that a facility elects to pump CRL-contaminated groundwater to the surface and discharge it directly, this final subcategory and corresponding limitations would apply to the end of that pipe. While groundwater monitoring may be appropriate to ensure that CRL is not evading the pump-and-treat operations and resulting in an unpermitted discharge to a WOTUS, the groundwater concentrations would not be subject to this final rule.

To further elaborate the point that the limitations established in this final rule are for surface water discharges, consider the alternatives to pump-and-treat operations. Facilities are not required to employ the specific technology of chemical precipitation established as BAT today. Some commenters specifically requested that the EPA consider the flexibility for facilities to clean close their surface impoundments or to perform *in situ* treatment or impermeable barriers. But this flexibility already exists. If a facility were to install an impermeable barrier that prevented groundwater contamination from discharging to a WOTUS, or a semi-permeable barrier that treated the discharge to remove toxic pollutants, it could satisfy the specific mercury and arsenic limitations that the EPA is finalizing. It also might be possible for facilities to avoid the need for an NPDES permit by clean closing and eliminating any point source itself. In these cases, there very well may continue to be CRL-contaminated groundwater, but this is outside the purview of the CWA because the CRL would not be reaching WOTUS, as discussed in the sections above. Thus, the EPA does not find any conflict between the CCR regulations' protection of groundwater and the establishment of BAT limitations for CRL discharged through that groundwater that is found to be the FEDD; nor does it find any way in which the two sets of requirements cannot be harmonized.

c. The EPA selects chemical precipitation as BAT for discharges of CRL in this subcategory.

For this subcategory, the EPA is establishing BAT limitations for mercury and arsenic based on chemical precipitation. Specifically, the technology basis for BAT is a chemical

[150] In contrast, the EPA acknowledges that the *Ky. Waterways All.* case found that RCRA's anti-duplication provision barred CWA authority, a finding which is not only not supported by the text of the CWA but is also to the EPA's knowledge not found in the case law of any other circuit.

[151] The EPA acknowledges that, at present, many facilities have instead selected monitored natural attenuation as a remedy even though this remedy would, by definition, patently fail to meet the cleanup standards established in § 257.97(b).



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precipitation system that employs hydroxide precipitation, sulfide precipitation (organosulfide), and iron coprecipitation.

As described in section VII.C.4 of this preamble, the rule record is extensive in support of the EPA's finding that chemical precipitation is technologically available for the treatment of arsenic and mercury in CRL. As far back as the 2015 rule, the EPA found that four plants operated chemical precipitation systems on their CRL.[152] EPA also found that chemical precipitation was in use on FGD wastewater (which the EPA found was characteristically similar to CRL), metal products and machinery plants, iron and steel manufacturers, metal finishers, and mining operations (including coal mines).[153] All of these uses have demonstrated the use of chemical precipitation technology to remove arsenic and mercury.[154]

At proposal, the EPA's preferred regulatory option would have established chemical precipitation as BAT for all types of CRL discharges. Several commenters took issue with the EPA's proposed findings and BAT selection for FEDDs of CRL. These commenters stated that EPA failed to evaluate how CRL changes in groundwater. Commenters stated that differences from end-of-pipe CRL suggest that the EPA should decline to set national limitations and retain case-by-case BPJ determinations for, or alternatively require only monitoring of, FEDD of CRL at this time.

With respect to the interaction of CRL with groundwater, while the EPA received general comments about the possibility of interactions in groundwater, commenters did not provide data to demonstrate that CRL in groundwater changes to the extent that pollutant concentrations would no longer fall within the range of concentrations evaluated by the EPA for CRL. Nor did commenters provide data that CRL becomes untreatable via chemical precipitation from any such changes. Instead, comments describe ''attenuation'' such as through adsorption. However, to the extent that adsorption and other attenuation processes would *remove* pollutants, this would only make it easier for chemical precipitation to meet the established limitations.

In addition to being technologically available, chemical precipitation for this subcategory is economically achievable. At proposal, EPA could not prospectively determine how many or which instances of CRL discharged through groundwater would ultimately be found to require CWA permits. As described above, to be a covered discharge, there must be a discharge (or FEDD) of pollutants from a point source into a WOTUS. Since this determination is outside the scope of the rule, EPA examined this cost via a sensitivity analysis entitled *Evaluation of Unmanaged CRL* (DCN SE11501). The fact that EPA estimated these costs (and pollutant loadings) in a separate document from the more traditional end-of-pipe discharges does not mean that the EPA concluded that none would be subject to CWA permitting, as some commenters claimed. Neither did the EPA's assumption for the purposes of a worst-case costing analysis suggest that the EPA was concluding that all of these potential discharges would be subject to CWA permitting, as other commenters claimed. Instead, when total costs (and pollutant loadings) are viewed in conjunction with this separate analysis, they provide the range within actual costs (and pollutant loadings) are expected to fall. The EPA acknowledges that a best estimate would be helpful, but in the absence of permitting determinations on which discharges are subject to CWA permitting, the EPA declines to speculate as to the ultimate coverage. This position is consistent with the position outlined above. All that the EPA is required to do for this rulemaking is make a reasonable estimation of costs, which EPA has does done. *See Chem. Mfrs. Ass'n* v. *EPA,* 870 F.2d at 237–38.

For the final rule, EPA has updated these CRL costs in *Evaluation of Unmanaged CRL* (DCN SE11501). These engineering costs were then used to develop an upper bound and lower bound that more accurately reflects the range of costs of treating unmanaged CRL as described in section VIII.A of this preamble. Using these costs, the EPA then conducted a screening-level analysis of economic impacts, which helped inform EPA's determination that the final rule's unmanaged CRL limitations are economically achievable. For further discussion of the screening-level analysis and economic achievability, see sections VII.F and VIII.C.1 of this preamble.

The EPA notes that some commenters suggested that state permitting authorities would face an incredible regulatory burden if the rule were finalized as proposed.[155] The EPA disagrees that it is creating any additional burden to permitting authorities in finalizing this subcategory. Permitting authorities are already required to determine whether a discharge is subject to CWA permitting and to act on applications for CWA permits or certain modification requests for such permits. Furthermore, FEDDs are already subject to the CWA under *Maui.* Thus, to the extent that permitting authorities are already required to evaluate and develop technology-based and water quality-based effluent limitations for FEDDs, this existing burden will not change, regardless of the EPA's selection of BAT. If burden is changing at all, it is decreasing, because EPA is selecting chemical precipitation as BAT, as discussed in the section below. Since this replaces BPJ determinations, it means that permitting authorities can avoid BPJ analyses that they otherwise would have performed for FEDDs of CRL.

d. The EPA rejects surface impoundments as BAT for discharges of CRL in this subcategory.

The EPA is not selecting surface impoundments as BAT for FEDDs of CRL. BAT must achieve ''reasonable further progress'' toward the CWA's goal of eliminating pollution. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1003, 1006 (citing *Nat'l Crushed Stone* v. *EPA,* 449 U.S. at 75). The record shows that chemical precipitation removes more pollutants than surface impoundments and that chemical precipitation is technologically available, is economically achievable, and has acceptable non-water quality environmental impacts.

With respect to comments suggesting the EPA finalize only a monitoring requirement, the EPA does not view monitoring alone as satisfying the statutory obligation to identify BAT to control all discharges, particularly where there is a technology that can be applied to control discharges of CRL, chemical precipitation, that is technologically available, is economically achievable and has acceptable non-water quality environmental impacts. As described in section XIV.C.3 of this preamble below, however, the EPA is finalizing additional monitoring requirements to

[152] U.S. EPA (Environmental Protection Agency). 2015. *Technical Development Document for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category.* September. EPA–821–R–15–007. Available online at: *https://www.epa.gov/sites/default/files/2015-10/documents/steam-electric-tdd_10-21-15.pdf.*

[153] *Id.*

[154] *Id.*

[155] Some comments also pointed to the state amicus brief filed in *Maui,* where states made this very argument in a broader context (an argument ultimately rejected by the *Maui* Court itself).



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support the implementation of the limitations in this subcategory.

e. The EPA rejects more stringent technologies as BAT for discharges of CRL in this subcategory.

EPA rejects zero-discharge systems as BAT for this subcategory. The EPA finds that the potential zero discharge costs for CRL discharges in this subcategory are unacceptably high. EPA's CRL costs as reflected in *Evaluation of Unmanaged CRL* (DCN SE11501) show that the capital costs of zero-discharge treatment could range as high as $17.4 billion while O&M costs could range as high as $2.04 billion per year. The annualized total costs of zero discharge could be as high as $3.69 billion. These costs are nearly an order of magnitude higher than total costs to the industry for all of the remaining end-of-pipe discharges from every wastestream combined (including costs associated with discharges of CRL that is not covered by this subcategory). The EPA finds that these additional zero discharge costs are unreasonable. Costs are one of the statutory factors that the EPA must consider, and courts have found that the EPA can properly rely on costs in rejecting potential BAT technologies. *See e.g., BP Exploration & Oil Inc.* v. *EPA,* 66 F.3d 784, 799–800 (6th Cir. 1995).[156] For further discussion of costs and economic achievability, see sections VII.F and VIII.

The EPA also rejects chemical precipitation plus low hydraulic residence time biological reduction as BAT for this subcategory. While no commenter recommended that the EPA select chemical precipitation plus low-hydraulic-residence-time biological reduction as BAT for discharges of CRL in this subcategory, the record does contain two plants treating traditional, end-of-pipe CRL with biological treatment. The EPA does not have sufficient data from these plants on which to base possible limitations. Therefore, the EPA declines to identify chemical precipitation plus biological treatment as BAT.[157]

[156] The high costs in this case were estimated to be about $3 billion in capital costs, or $6.7 billion after adjusting for inflation to 2023 dollars. The EPA notes that the $17.4 billion in capital costs for zero discharge here, even if only half of such discharges are covered, would still be higher (about 2.5 times).

[157] Although the EPA did not conduct a sensitivity analysis on costs of this technology as it did for chemical precipitation or zero discharge, the EPA notes that this cost would be between these two costs based on the cost estimation results of the previous rulemakings. Since these costs would be higher than chemical precipitation alone, they may also be unacceptably high, as are the costs for zero discharge.

6. Legacy Wastewater Discharged From Surface Impoundments Commencing Closure After July 8, 2024

The EPA is establishing a new subcategory for legacy wastewater discharged from surface impoundments which commence closure under the CCR regulations after July 8, 2024. For units in this subcategory, the EPA is establishing mercury and arsenic limitations based on chemical precipitation. More specifically, the technology basis for BAT includes the same chemical precipitation system described in the 2015 rule, which employs hydroxide precipitation, sulfide precipitation (organosulfide), and iron coprecipitation.

At proposal, the EPA solicited comment on a legacy wastewater subcategory for composite-lined surface impoundments that meet the location restrictions of the CCR regulations. In contrast to most surface impoundments, the EPA identified 22 surface impoundments at 17 facilities in *Legacy Wastewater at CCR Surface Impoundments* (DCN SE10252) that the record indicated met these criteria. The EPA solicited comment on this subcategory because its view was that these surface impoundments can continue to operate and thus would likely not begin closure and dewatering until after the effective date of any final ELG. Since these surface impoundments would not already be in the midst of dewatering under the tight closure timeframes of the CCR regulations, these facilities would have time to develop a CCR closure plan that included wastewater treatment during the dewatering phase of closure. Many commenters were opposed to the establishment of such a subcategory based on liner type. The EPA also received comments, however, recommending that, in order to address the issue that it had raised at proposal about potentially differentiated limitations for certain impoundments that have not already begun to dewater, a legacy wastewater subcategory should be created that is defined based on a deadline under the CCR regulations.

After considering the comments received and evaluating the record in light of the factors specified in CWA section 304(b)(2)(B), the EPA concludes that a subcategory is warranted for certain legacy wastewater discharges based on process changes at these plants happening under the CCR regulations. First, the EPA agrees with commenters that a liner-based subcategory would be inappropriate. On the one hand, some composite-lined surface impoundments may have already commenced closure under the CCR regulations. Thus, a subcategory that included these units would still include surface impoundments in the midst of closure under the tight deadlines of the CCR regulations, the very scenario described in section VII.B.4 of this preamble, for which the EPA found it is inappropriate to establish nationwide BAT limitations. On the other hand, the CCR regulations include flexibilities that allow a facility needed for reliability to continue to receive waste in an unlined surface impoundment or to make an alternate liner demonstration to continue to receive waste in an unlined surface impoundment. In both cases, the unlined surface impoundment could continue operation and not commence closure until after the ELG effective date. Thus, similar to the lined units discussed at proposal, these facilities would be able to build wastewater treatment into their closure plans. As is apparent from this discussion, a subcategory based on liner type is potentially both overinclusive and underinclusive, which was not the EPA's intent.

The EPA does, however, agree with comments suggesting an alternative subcategory designation more appropriately aligned with the EPA's intent and tied to the regulatory triggers in the CCR rule. It was suggested that the EPA consider using the CCR regulations' cease receipt of waste date; however, after a more thorough examination of 40 CFR part 257, the EPA finds that the ''commence closure'' date of § 257.102(e) is the appropriate regulatory trigger. This provision applies to surface impoundments that are not closed for cause (*i.e.,* unlined or failing location restrictions), but rather because the surface impoundment will no longer be used.[158] This subcategorization solves the dual problem described for the proposed liner-based subcategorization above. If a lined surface impoundment has already commenced closure under § 257.102(e), then it would not be subject to this subcategory, and if an unlined surface impoundment is continuing to operate under one of the CCR rule flexibilities, then it will not yet have commenced closure pursuant to this provision. Thus, the final rule subcategory captures only surface impoundments that are not in the midst of closure, as the proposed rule intended. While the

[158] Commencing closure is triggered when a unit ceases receipt of waste or ceases extraction of materials for beneficial use, though facilities are also permitted to postpone this commence closure date if they make a filing that the facility intends to restart the receipt of waste or extraction of materials for beneficial use at a specific future date.



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EPA declined to establish nationwide BAT limitations for legacy wastewater in section VII.B.4 of this preamble based on process changes, specifically the ongoing closure of these units under the CCR rule, the EPA finds that this factor is inapplicable to the legacy wastewater that will be discharged in the future at these subcategorized surface impoundments.

a. The EPA selects chemical precipitation as BAT for legacy wastewater in this subcategory.

Since nationwide limitations are appropriate for this subcategory, the EPA next evaluates the final rule technology basis of chemical precipitation. For this subcategory of legacy wastewater discharges, EPA is establishing chemical precipitation-based limitations, as they are available, are economically achievable, and have acceptable non-water quality environmental impacts, as described below.

The EPA finds that chemical precipitation is available to treat legacy wastewater in this subcategory. At the time of the 2015 rule, the Agency acknowledged that chemical precipitation was being used on legacy wastewater discharges comprised of ash transport water. 80 FR 67855. Since that time, the EPA has learned of additional use on legacy wastewater of chemical precipitation at two Duke facilities and an SDE system at Boswell Energy Center. In addition to the use of chemical precipitation at a number of legacy wastewaters domestically, the EPA notes that, in the 2015 record, it did not discuss potential technology transfer of chemical precipitation-based limitations to legacy wastewater based on its performance in treating other wastestreams that comprise legacy wastewater. The Agency has consistently found, however, that two of the other three wastewaters regulated in this final rule (FGD wastewater and CRL) have the same pollutants and are amenable to treatment with the same treatment systems. As a result of this finding, the 2015 rule established NSPS for CRL based on chemical precipitation. Furthermore, in 2015, also found that CRL has the same pollutants as BA transport water, a wastewater that some facilities treated with chemical precipitation at the time of that final rule. *See* EPA–HQ–OW–2009–0819–6230. In short, the three wastewaters being regulated in this final rule for which the EPA is amending the legacy wastewater limitations have all been successfully treated with chemical precipitation systems. Based on what is known about the properties of these treatment systems, the characteristics of the various wastestreams at issue, and the demonstrated ability of chemical precipitation to treat such wastestreams, the EPA is transferring mercury and arsenic limitations from FGD wastewater and CRL to the subcategory of legacy wastewater described in this section for the final rule. As previously explained, EPA may rely on technology transfer to establish technology-based limitations such as those in this rule. *See Am. Iron & Steel Inst.* v. *EPA,* 526 F.2d at 1058, 1061, 1064; *Weyerhaeuser Co.* v. *Costle,* 590 F.2d at 1054 n.70; *Reynolds Metals Co.* v. *EPA,* 760 F.2d at 562; *California & Hawaiian Sugar Co.* v. *EPA,* 553 F.2d at 287.

The EPA also finds that the costs of chemical precipitation systems are economically achievable for the subcategory. At proposal, the EPA evaluated the costs for legacy wastewater in a sensitivity analysis. For this final rule, EPA has included these costs in its primary cost estimates and economic screening analysis. IPM, which projects decisions on dispatch of EGUs, is not affected by these costs, which occur irrespective of generation. Thus, the costs are not included in the IPM analysis. However, the cost analysis demonstrates that costs for treating this wastestream are low, a finding that is bolstered by the relatively low impacts as a percent of revenues as seen in the economic screening analysis of the final rule. (For further information, see sections VII.F and VIII.) Because the EPA is required to consider whether the cost of BAT can be reasonably borne by the industry and confers on the EPA discretion in consideration of the BAT factors, *see, e.g., Chem. Mfrs. Ass'n* v. *EPA,* 870 F.2d at 262; *Weyerhaeuser* v. *Costle,* 590 F.2d at 1045, EPA finds that these additional costs are economically achievable as that term is used in the CWA.

Finally, the EPA finds that the non-water quality environmental impacts associated with chemical precipitation systems for controlling legacy wastewater discharges in this subcategory are acceptable. See sections VII.G and X below for more details.

b. The EPA rejects less stringent technologies as BAT for legacy wastewater in this subcategory.

The EPA did not select surface impoundments as BAT for legacy wastewater in this subcategory, as surface impoundments would remove fewer pollutants than the BAT technology selected above, which is available, is achievable, and has acceptable non-water quality environmental impacts, and which will better achieve the BAT requirement of making reasonable further progress toward the CWA's goals. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1003, 1006 (citing *Nat'l Crushed Stone* v. *EPA,* 449 U.S. at 75).

c. The EPA rejects more stringent technologies as BAT for legacy wastewater in this subcategory.

The EPA is not selecting chemical precipitation plus biological treatment as BAT for legacy wastewater in this subcategory. Biological treatment requires a period of optimization for concentration and composition of the microorganisms to reach a steady state in which the reduction-oxidation activity of the microorganisms can reduce pollutants of concern without creating excessive levels of hydrogen sulfide gas. Unlike FGD wastewater, however, which is a relatively consistent wastewater that can be equalized in tanks to moderate differences before treatment, legacy wastewater being drained from a surface impoundment is known to quickly change pollutant concentrations as the surficial water is drained and dewatering progresses down through one or more layers of CCR. Due to the relatively short timelines for dewatering when compared to the equalization timeframes for the bacteria, biological reduction would not be able to consistently meet the biological treatment-based limitations established for FGD wastewater in the 2015 or 2020 rules.

The EPA is also not selecting chemical precipitation plus ZVI systems as BAT. The EPA acknowledges that it learned of a plant using this technology to treat its legacy wastewater. The EPA does not, however, have any information in the record on the influent or effluent data from this system to establish limitations, nor has the EPA developed ZVI-based limitations for any other wastestream that it can transfer. Commenters did not advocate for establishment of limitations based on ZVI systems, nor submit any information related to the performance of these systems, including data that would allow the Agency to develop numerical limitations; therefore, the EPA cannot, at this time, establish limitations based on chemical precipitation plus ZVI systems.

The EPA finds that zero-discharge systems are not BAT for legacy wastewater in this subcategory based on the statutory factor of age and cost, as well as given certain information gaps in the record. Specifically, the EPA finds that more stringent zero-discharge technologies are not commensurate with the age of the facility being in a retired status, which would lead to unacceptably higher capital costs that



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can no longer be spread over electricity sales.

As described in section VII.C.4 of this preamble with respect to CRL generated and discharged after a plant retires, surface impoundment dewatering at EGUs in this subcategory is also likely to take place when a facility would no longer be generating revenue, as several commenters pointed out. Thus, any treatment system, including the selected BAT basis of chemical precipitation, built to operate only after retirement will necessarily have to incur capital costs in a disparate circumstance of a post-retirement age when compared to costs to EGUs that dewater their impoundments while still generating revenue. Compared to chemical precipitation systems, however, zero-discharge systems worsen the disparate circumstance of EGUs facing costs while in a retired status. Zero-discharge systems typically have capital costs approximately double the capital costs of chemical precipitation systems alone. The EPA finds that the increased cost of these more stringent technologies renders them unacceptable in light of the unique position of the EGUs to which they would apply. The EPA intends that the cost and economic achievability rationale discussed here is unique to the small number of industry-wide discharges at retired facilities with no revenue, and thus will not form a precedent for evaluating costs and economic achievability at the vast majority of facilities which continue to operate and have active revenue streams.

The EPA also notes that there are data gaps in the record for zero-discharge technologies. The current record reflects only a single facility employing a zero-discharge SDE system to treat legacy wastewater, and unlike Boswell Energy Center, many facilities in this subcategory will dewater and close their ash impoundments after the facility ceases generating electricity. Without electricity production, there is no slipstream of flue gas with which to operate the same type of SDE system that is achieving zero discharge at Boswell. The EPA is not aware of any other facility that is employing a zero-discharge technology, such as membrane filtration or thermal evaporation, to treat its legacy wastewater. While it is possible that the EPA could transfer non-zero numerical limitations from treatment of other wastestreams using these technologies, given the information gap and the additional costs in the context of these EGUs unique position discussed above, the EPA declines to select zero-discharge systems as BAT for legacy wastewater in this subcategory.

7. Interim Limitations Applicable to FGD Wastewater and BA Transport Water

The EPA is retaining the final 2020 rule BAT technology bases and limitations for FGD wastewater and BA transport water as interim limitations until the applicability dates of the new zero-discharge limitations (see section VII.E of this preamble for availability timing of the new requirements). Specifically, the 2020 rule established BAT limitations for FGD wastewater based on chemical precipitation plus low hydraulic residence time biological reduction or, in the case of the high FGD flow and LUEGU subcategories, based on chemical precipitation only. BAT limitations for BA transport water were based on high recycle rate systems with up to a 10 percent volumetric purge or, in the case of the LUEGU subcategory, based on surface impoundments with a BMP plan. The EPA finds that the 2020 BAT technology bases continue to be available, economically achievable, and have acceptable non-water quality environmental impacts for all of the reasons stated in the 2020 rulemaking and as supplemented by the new IPM analyses updating the Agency's economic achievability determination and further discussed below.

Although it proposed more stringent zero-discharge limitations in 2023, the Agency always intended that the 2020 rule limitations would continue to apply. For example, when EPA explained its reasoning as to why it did not postpone the requirements in the 2020 rule, it stated, ''There is no basis in the record indicating that the limitations finalized in 2020 are not available or economically achievable, and thus there is no reason for the EPA to postpone their implementation. EPA is focused on progress toward eliminating discharges, consistent with CWA section 301(b)(2)(A).'' 88 FR 18886. Similarly, the EPA's earlier announcement of this supplemental rulemaking stated (and the proposal reiterated) that ''the pollutant reductions accomplished by the existing rules will occur while the Agency engages in rulemaking to consider more stringent requirements.'' 86 FR 41802.

The EPA received many comments from electric utilities arguing that this approach was not appropriate. Some commenters claimed that the EPA should have halted implementation while it considered rule revisions. Some commenters stated that costs of the 2020 rule technologies would not be fully recovered over the timeframe before new, more stringent limitations would come into effect. Others described these costs as high, or potentially drawing investment away from the transition to cleaner energy sources. One commenter claimed that the EPA violated its own policy of only revisiting ELGs for seven years after a final regulation is issued. Finally, the EPA received comments that the 2020 rule limitations were well founded.

After considering public comments, including those mentioned above, the EPA is retaining the 2020 rule limitations applicable to FGD wastewater and BA wastewater as interim limitations before the applicability dates of the zero-discharge limitations finalized. The EPA disagrees that it should have halted implementation of the 2020 rule. The EPA found the 2020 rule technologies to be available, economically achievable, and to have acceptable non-water quality environmental impacts. While the EPA agrees that cost recovery periods for the 2020 rule technologies will be curtailed, and that it is possible that this would divert investment dollars from clean energy projects, the record shows that the total costs of implementing the technologies of both rules under the corresponding timeframes are economically achievable according to the Agency's IPM modeling, discussed further in section VII.F of this preamble. Furthermore, the EPA disagrees with comments suggesting it cannot revisit an ELG for seven years. The EPA has revisited many final ELG rules within this time frame, either as the result of a court's vacatur or remand, or as the result of an administrative petition. In fact, the same commenter arguing against the EPA's supplemental rulemaking here submitted administrative petitions for the EPA to reconsider the 2015 rule, and at that time found no procedural problem with the EPA revising a rule before seven years had elapsed.

The EPA views the retention of the 2020 BAT limitations for FGD wastewater and BA wastewater in the interim as in keeping with the technology-forcing nature of the CWA and essential for meeting the statutory requirement that BAT result in reasonable further progress toward the CWA's goal of zero discharge of pollutants. *See Nat. Res. Def. Council* v. *EPA,* 808 F.3d 556, 563–64 (2d Cir. 2015) (''Congress designed this standard to be technology-forcing, meaning it should force agencies and permit applicants to adopt technologies that achieve the greatest reductions in pollution.'') (citation omitted). Without these interim limitations, which have a

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latest applicability date of December 31, 2025, plants could potentially have up to December 31, 2029 (the latest applicability for the zero-discharge requirements in this final rule), before they are required to meet limitations beyond the 1982 limitations based on surface impoundments. The EPA never intended that, as part of this rulemaking to explore additional pollutant discharge reductions that this industry could achieve, plants could thereby avoid taking available and achievable steps toward discharge control in the interim. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1003–1004 (describing the 1982-era regulations as from a ''by-gone era'' in which limitations were based on the ''archaic'' technology of surface impoundments, ''which are essentially pits where wastewater sits, solids (sometimes) settle out, and toxins leach into groundwater.''). More information on implementation of the 2020 rule limitations as an interim step toward achievement of the new zero-discharge FGD wastewater limitations is available in section XIV.A of this preamble.

*D. Additional Rationale for the Proposed PSES and PSNS*

Before establishing PSES/PSNS for a pollutant, the EPA examines whether the pollutant ''passes through'' a POTW to WOTUS or interferes with the POTW operation or sludge disposal practices. In determining whether a pollutant passes through POTWs for these purposes, the EPA typically compares the percentage of a pollutant removed by well-operated POTWs performing secondary treatment to the percentage removed by the BAT/NSPS technology basis. A pollutant is determined to pass through POTWs when the median percentage removed nationwide by well-operated POTWs is less than the median percentage removed by the BAT/NSPS technology basis. The EPA establishes pretreatment standards for those pollutants regulated under BAT/NSPS that pass through POTWs.

The EPA received comments that it should update this analysis to include more recent POTW pollutant removal data. Specifically, one commenter pointed to more recent analyses that POTWs remove 45 percent of arsenic and 60 percent of mercury. This comment also faulted the EPA for summarily finding that pollutants treated by a zero-discharge system would pass through a POTW since the POTW does not achieve 100 percent removals of these pollutants.

After considering these comments, the EPA finds that the 2015 rule pass-through analyses of these same technologies is still representative of current pollutant behavior. Specifically, the EPA is continuing to rely on the pass-through analyses as the basis of the limitations and standards in the 2015 rule as the Agency did in the 2020 rule. This analysis found that POTWs do not significantly remove mercury and arsenic in several wastewaters. Contrary to commenters' assertions that new data show some significantly improving removals of these pollutants, the EPA notes that table 10–1 of the 2015 TDD shows median arsenic removals of 65.8 percent and median mercury removals of 90.2 percent, higher removals than the new removal data cited by the commenters. Thus, because the EPA considered pass-through using higher pollutant removals, the EPA's findings would not change substituting the new pollutant removal data. With respect to zero discharge, the EPA is establishing zero-discharge limitations for three wastestreams in this rule. As in the 2015 rule, the EPA did not conduct its traditional pass-through analysis for wastestreams with zero-discharge limitations or standards. Zero-discharge limitations and standards achieve 100 percent removal of pollutants, including salts like boron and bromide which are not treated at all by the typical POTW treatment system.[159] Therefore, the EPA concludes that all pollutants in those wastestreams treated by the zero-discharge technologies would otherwise pass through the POTW absent application of the zero discharge technologies that form the BAT bases for FGD wastewater, BA transport water, and CRL.

*PSES.* After considering public comments and the record in light of the relevant CWA statutory factors, the EPA is establishing PSES for indirect discharges based on the technologies described in Option B. EPA is establishing Option B technologies as the bases for PSES for the same reasons that it is finalizing the Option B technologies as the bases for BAT for direct dischargers. The EPA's analysis shows that, for both direct and indirect dischargers, the final rule technologies are available and economically achievable, and they have acceptable non-water quality environmental impacts, including energy requirements (*see* sections VIII and X). For the final rule, the EPA is not selecting other technology bases for PSES for the same reasons that it is not finalizing other technology bases for BAT.

Furthermore, the EPA reaches the same conclusions for the same reasons discussed in section VII.C of this preamble with respect to several subcategories. EPA finds that retention of differentiated PSES for EGUs permanently ceasing coal combustion by 2028 are warranted. The EPA also finds establishing two new subcategories with differentiated PSES for EGUs permanently ceasing coal combustion by 2034 and legacy wastewater discharged from surface impoundments commencing closure after July 8, 2024, is warranted. In contrast, the EPA is not establishing a subcategory with differentiated PSES for discharges of unmanaged CRL because that subcategory is only intended to address CRL discharges that are found by a permitting authority to be the functional equivalent of a *direct* discharge to WOTUS or that are *direct* discharges of CRL to a WOTUS that result from the capture and pumping to the surface of CRL that has leached from a waste management unit into the subsurface and mixed with groundwater. Given the high volumes associated with operations that might capture and pump to the surface CRL that has leached from a waste management unit into the subsurface, the EPA does not expect facilities to find it a cost-feasible alternative to send such volumes to a POTW.

With respect to the low utilization subcategory, the EPA is eliminating the PSES subcategory for LUEGUs, as it does for direct dischargers, after further considering specific facts about the universe of plants that would potentially qualify for this subcategory. The EPA is only aware of one indirect discharger that has filed a NOPP to potentially avail itself of this subcategory, the Whitewater Valley Station; the EPA received no further comments indicating other indirect dischargers that planned to make use of the 2020 LUEGU subcategory. Whitewater Valley Station consists of two EGUs (Coal Boiler #1 and Coal Boiler #2). Coal Boiler #1 has a nameplate capacity of 35 MW, and it had 2019 and 2020 CURs of 5 percent and 3.67 percent, respectively. Coal Boiler #2 has a nameplate capacity of 65 MW, and it had 2019 and 2020 CURs of 5.5 percent and 5.1 percent, respectively. On its website, IMPA states that the station ''has been utilized by IMPA during peak load periods during the hot summer months and cold winter months.'' [160] This utilization

[159] The commenter has, in fact, historically sent its FGD wastewater to a POTW, thereby diluting the wastewater to the extent that it can meet a water quality-based effluent limitation for boron.

[160] *See www.impa.com/about-impa/generation-resources/giant-tcr.*



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profile was confirmed by IMPA's comments on the 2023 proposed rule. At proposal, the EPA noted that Coal Boiler #1 is small enough to avail itself of the 2015 rule subcategory for small EGUs (*i.e.,* less than or equal to 50 MW nameplate capacity). While IMPA agreed, it also conveyed in its comments that it may not be able to increase the utilization of this small EGU without changes to its permits, and furthermore that this would not make up for any loss of operation of Coal Boiler #2 since both EGUs perform winter and summer peaking operations in tandem.

IMPA also clarified in its comments that the ash handling system it employs to comply with the CCR rule has not resulted in the elimination of its BA transport water discharges. The system includes dewatering bins followed by the addition of flocculant and coagulant to facilitate particulate removals in geotubes. Remaining wastewater is then sent to four polishing surface impoundments that are not designed to hold an accumulation of CCR, and thus not subject to the CCR rule, before the wastewater is sent to the POTW. While IMPA also provided concentration data from its BA transport water, none of this information demonstrated removals of pollutants to a degree that would change the results of the pass-through analysis from the 2015 rule.

Finally, IMPA provided comments describing the costs of potential BA transport water modifications, the impacts to the local community, and the potential for the facility to continue to support reliability.[161] In the comments regarding reliability, IMPA appeared to suggest that the facility would be operating until 2032. IMPA and the EPA had a follow-up conversation to discuss these comments and the EPA confirmed that, in the absence of outside factors, the facility is expecting to cease operations in 2032.

After considering the comments and information in the record, the EPA is eliminating the LUEGU subcategory for indirect dischargers as unnecessary and not supported by the factors relied on in 2020. With respect to FGD wastewater under the LUEGU subcategory, no NOPPs were filed from indirect dischargers requesting this subcategory for this wastestream. Thus, continued existence of this subcategory is unnecessary. With respect to BA transport water, EPA notes that, under the final rule's subcategory for EGUs permanently ceasing coal combustion by 2034, the one facility with indirect discharges to a POTW known to be interested in using the 2020 LUEGU subcategory would be able to continue to operate under the BA transport water PSES of the 2020 rule and retire in 2032 as planned without incurring any additional treatment costs and without creating an energy reliability concern. Thus, the LUEGU subcategory is no longer supported by the factors the EPA cited in the 2020 rule, nor any other factors.

*PSNS.* The EPA selects zero-discharge systems as the bases for the CRL PSNS for the same reasons that EPA selects these systems as the bases for the CRL NSPS (see section VII.B.3 of this preamble). The EPA's record demonstrates that zero-discharge systems are available and demonstrated, do not pose a barrier to entry, and have acceptable non-water quality environmental impacts, including energy requirements (see sections VII.G and X of this preamble). The EPA rejected other options for CRL PSNS for the same reasons that it rejected other options for CRL NSPS. And, as with the final CRL PSES, the EPA concludes that the final CRL PSNS prevent pass through of pollutants from POTWs into receiving streams and help control contamination of POTW sludge.

### *E. Availability Timing of New Requirements*

Where BAT limitations in the 2015 and 2020 rules are more stringent than previously established BPT limitations, those BAT limitations do not apply until a date determined by the permitting authority that is ''as soon as possible'' after considering four factors. Depending on the particular wastewater, the 2015 and 2020 rules also established a ''no later than'' date of December 31, 2023, or December 31, 2025, for reasons discussed in the record of those rules, including that, without such a date, implementation could be substantially delayed, and a firm ''no later than'' date creates a more level playing field across the industry.

As part of the consideration of the technological availability and economic achievability of the new BAT limitations in this regulation, the EPA considered the magnitude and complexity of process changes and new equipment installations that would be required for plants to meet the final rule's new, more stringent limitations and standards. Specifically, the EPA considered timeframes that enable many plants to raise needed capital, plan and design systems, procure equipment, and construct and test systems. The EPA also considered the timeframes needed for appropriate consideration of any plant changes being made in response to other Agency rules affecting the steam electric power generating industry. The EPA understands that some plants may have already installed, or are now installing, technologies that could comply with the rule's limitations. Therefore, EPA finds that the earliest date some plants can achieve compliance with these new limitations would be July 8, 2024. Where this is not the case, nothing in this rule would preclude a permitting authority from establishing a later date, up to the ''no later than'' date, after considering the four specific factors in 40 CFR 423.11(t).[162]

With respect to the latest compliance dates, the EPA collected updated information on the technical availability of the BAT technology bases. Information in EPA's rulemaking record indicates that a typical timeframe to raise capital, plan and design systems (including any necessary pilot testing), procure equipment, and construct and test systems falls well within the existing five-year permit cycle.[163] Furthermore, the chemical precipitation and zero-discharge BAT technologies here do not implicate the same industrywide competition over a small number of biological treatment vendors that the 2020 rule implicated. The EPA notes that while plants may not need about five years to comply with the final limitations, the ''no later than'' date creates an outer boundary beyond which no discharger may seek additional time and creates a level playing field regarding the latest date. Therefore, the EPA is finalizing the requirement that the new limitations for FGD wastewater, BA transport water, and CRL be achieved ''no later than'' December 31, 2029.

The EPA received comments that these ''no later than'' dates should be shortened or lengthened. Comments suggesting shortening these timeframes focused on record information

[161] While the EPA received comments from other parties about the elimination of this PSES subcategory, only IMPA provided site-specific information that was potentially relevant to the EPA's discussion here. For further discussion of comments, see *Response to Public Comments for Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, April 2024* (SE11794).

[162] These factors are: (1) time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of the final rule; (2) changes being made or planned at the plant in response to GHG regulations for new or existing fossil fuel-fired power plants under the CAA, as well as regulations for the disposal of coal combustion residuals under subtitle D of RCRA; (3) for FGD wastewater requirements only, an initial commissioning period to optimize the installed equipment; and (4) other factors as appropriate. *See* 40 CFR 423.11(t).

[163] *See* FGD and Bottom Ash Implementation Timing (DCN SE08480).



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describing that individual facilities can install certain technologies in timeframes shorter than out to 2029. EPA declines to establish ''no later than'' dates shorter than one permit cycle from the final rule. Some permits may not be renewed and able to incorporate the new limitations until 2029, and this later date creates an even playing field for the industrial category. In contrast, commenters suggesting lengthening these timeframes did not provide specific data that demonstrate a legitimate need for a longer timeframe. In the absence of data demonstrating different timelines are necessary or appropriate (*e.g.,* engineering dependency charts), the EPA cannot justify timeframes longer than those in the Agency's current record.

For the new subcategory for EGUs permanently ceasing coal combustion by 2034, the EPA is finalizing different availability timing for the BAT limitations applicable to CRL discharged after cessation of coal combustion. Since CRL was not covered by the 2020 permanent cessation of coal subcategory, plants with EGUs retiring both before and after 2028 may wish to avail themselves of the CRL limitations applicable to the subcategory for EGUs permanently ceasing coal combustion by 2034. Furthermore, as discussed in section VII.C.4 of this preamble, the new subcategory for EGUs permanently ceasing coal combustion by 2034 takes into account the changes expected to occur in CRL flow after closure of the WMU, the timing of which depends on, but is not the same as, the date the EGU will cease coal combustion. To facilitate administration, the EPA is adopting the same ''as soon as possible'' applicability timing framework as used for other limitations in this rule. Thus, the BAT limitations for mercury and arsenic in CRL discharges from this subcategory must be met as soon as possible beginning 120 days after permanent cessation of coal combustion. Since the subcategory allows for permanent cessation of coal combustion by December 31, 2034, with an additional 120 days allowed for the discharge of FGD wastewater, the Agency is adopting an April 30, 2035 ''no later than'' date for meeting BAT limitations for discharges of CRL from this subcategory.[164] Thus, while a permitting authority must establish availability timing that is ''as soon as possible,'' nothing in this rule would preclude a permitting authority from establishing a later date, up to the ''no later than'' date, after considering the four specific factors in 40 CFR 423.11(t). For PSES in this subcategory the statute does not allow for flexible availability timing and so here, to provide the same flexibility, the Agency is adopting tiered limitations with the second tier applying no later than April 30, 2035.

For the discharge of legacy wastewater, the EPA is not establishing the same ''no later than'' date framework as the other wastewaters. Instead, the limitations for legacy wastewater are simply effective on July 8, 2024. For legacy wastewater generally, this makes sense because the BAT limitations are based on a permitting authority's BPJ, and permitting authorities may consider the availability timing of technologies to a particular plant as part of its BAT determination. For legacy wastewater in the new subcategory described in section VII.C.6 of this preamble, this will have no impact because, as of the effective date of this rule, these surface impoundments will not have triggered the requirements under the CCR regulations to cease receipt of waste and commence closure. Furthermore, allowing for up to five years before the limitations' ''no later than'' date could provide time for circumvention of these limitations where a plant quickly drains its surface impoundment under the existing case-by-case approach.

As with the new BAT effluent limitations, in considering the availability and achievability of the new PSES, the EPA concluded that existing indirect dischargers need some time to achieve the final standards, in part to avoid forced outages. While the BAT limitations apply on a date determined by the permitting authority that is as soon as possible beginning on the effective date of the final rule, but no later than December 31, 2029, under CWA section 307(b)(1), pretreatment standards shall specify a time for compliance not to exceed three years from the date of promulgation, so the EPA cannot establish a longer implementation period. Moreover, unlike requirements on direct discharges, requirements on indirect discharges are not implemented through NPDES permits. Nevertheless, the EPA finds that all existing indirect dischargers can meet the standards within three years of promulgation as discussed below.

At proposal, the EPA projected that there would be no remaining indirect dischargers of FGD wastewater. In response to this finding, City Water, Light and Power (CWLP) filed comments indicating that it retains the option of either sending its treated FGD wastewater to the local POTW, or directly discharging. The EPA takes CWLP at its word that it will continue to be an indirect discharger at least some of the time. Nevertheless, the EPA estimates that it would take a single plant 18 to 28 months to achieve zero discharge for both FGD wastewater and CRL. Similarly, with respect to BA transport water, the EPA estimates that a closed-loop system can achieve zero discharge within 35 months, and substantially sooner if a high recycle rate system is already operating.[165] Finally, with respect to legacy wastewater and CRL generated after permanent cessation of coal combustion, the EPA estimates the chemical precipitation systems can achieve the mercury and arsenic limitations within 22 months.[166] Thus, the final PSES are available 3 years after publication of the final rule. Further discussion of availability timing can be found in section XIVB.1 of this preamble.

*F. Economic Achievability*

Under the CWA, BAT limitations must be economically achievable. Courts have interpreted the economic achievability requirement as a test of whether the regulations can be ''reasonably borne'' by the industry as a whole. *Chem. Mfrs. Ass'n* v. *EPA,* 870 F.2d at 262; *BP Exploration & Oil* v. *EPA,* 66 F.3d at 799–800; *see also Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1006; *Nat'l Wildlife Fed'n* v. *EPA,* 286 F.3d 554, 570 (D.C. Cir. 2002); *CPC Int'l Inc.* v. *Train,* 540 F.2d 1329, 1341–42 (8th Cir. 1976), *cert. denied,* 430 U.S. 966 (1977). ''Congress clearly understood that achieving the CWA's goal of eliminating all discharges would cause 'some disruption in our economy,' including plant closures and job losses.'' *Chem. Mfrs. Ass'n* v. *EPA,* 870 F.2d at 252 (citations omitted).

At proposal, the EPA found that the rule was economically achievable, but solicited comment on whether and how to include the impacts of the IRA for the final rule analysis. The EPA received comments recommending modifications to its use of IPM. Specifically, some commenters recommended including the impacts of the IRA in the baseline, while other comments disagreed that the EPA should include the IRA impacts, with the latter commenters suggesting that any results with the IRA

[164] Where EGUs are ceasing coal combustion near the end of this timeframe, or where closure of a WMU is lengthy such that it extends past this latest date, it is possible that a facility may not be able to fully take advantage of this flexibility for all of its WMUs.

[165] DCN SE08480.

[166] The EPA expects this timing to be similar to a chemical precipitation installation for FGD wastewater, DCN SE10289.



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included would be speculative and uncertain. The EPA also received comments that its findings should consider the joint impact of multiple regulations on this industry.

The EPA acknowledges these comments. The EPA used IPM to perform cost and economic impact assessments, using a baseline that reflects impacts from the IRA and final environmental regulations that were published before this rule was signed (*see* RIA).[167] As explained in detail in section VIII of this preamble, the IPM baseline used for this analysis includes the impacts of the IRA and several other final power sector regulations published before this rule. This is consistent with OMB Circular A–4 and EPA's *Guidelines for Preparing Economic Analysis.*[168] The EPA did not, however, include all the regulations some comments suggested. For example, two CAA rules, the MATS and section 111 rules, are being issued contemporaneously with this ELG and none of these rules includes the others in the baseline of the primary IPM analysis. This too is consistent with OMB guidelines and established EPA practice.

EPA's analysis for the final BAT limitations and PSES demonstrates that they are economically achievable for the steam electric industry, as required by CWA section 301(b)(2)(A). For the final rule, the model projected very small additional effects on the electricity market, on both a national and regional sub-market basis. Based on the results of these analyses, the EPA estimated that the final rule requirements would result in a net reduction of 5,782 MW in steam electric generating capacity as of the model year 2035, reflecting full compliance by all plants. This capacity reduction corresponds to a net effect of approximately five early plant retirements.[169] These IPM results support the EPA's conclusion that the final rule is economically achievable.

Furthermore, before the IPM analysis, the EPA also performed a cost-to-revenue screening analysis which included costs to wastestreams not tied to ongoing electric generation (*i.e.,* costs which would not change operational decisions in IPM). Specifically, this analysis included the upper bound and lower bound costs for treating unmanaged CRL as well as the costs of treating legacy wastewater discharged from surface impoundments commencing closure after July 8, 2024. For further discussion of these costs, see section VIII.A of this preamble. The screening-level assessment of economic impacts showed a greater potential for impacts with 13 to 17 parent entities incurring annualized costs representing one percent or more of their revenues, including 6 to 9 parent entities that would incur costs representing more than three percent of revenue. Since the EPA estimates that there are between 220 and 391 parent entities, this means that between three and eight percent of parent entities would incur costs representing one percent or more of their revenues and a subset of between two and four percent of parent entities would incur costs representing more than three percent of revenue. However, as noted in the RIA, these results are based on the conservative assumption that zero costs are passed on to consumers and represent a worst-case scenario from the plant owners' perspective. The combination of the screening analysis (including unmanaged CRL costs) and the IPM market-level results (excluding unmanaged CRL costs) supports the EPA's conclusion that the final rule is economically achievable.

Other considerations also support the EPA's findings on economic achievability. While EPA properly excluded from its main analysis regulations that are being issued contemporaneously with this rule and that were not published before this rule was signed, the Agency conducted a supplemental analysis to evaluate the cumulative effect of multiple rules affecting the electric power sector. This multi-rule modeling includes this final rule, CAA sections 111(d) and 111(b) EGU rules, and MATS as a combined policy scenario, and includes the EPA vehicle rules (LDV, MDV and HDV) in the baseline (*i.e.,* relevant EPA rules). As such, the results of this modeling cannot be used to show the individual effect of this final rule and are not a substitute for the rule-specific modeling EPA conducted to determine economic achievability of the final rule. However, the multi-rule modeling does clearly illustrate that the cumulative effect of these rules in terms of reduction in steam electric generating capacity is less than the sum of each of these rules individually. This means that, considering the rules together, the affected universe of EGUs with significant mitigation responsibilities under the EPA rules that make up the policy case is overlapping, not purely additive, as it largely reflects the same segment of the grid's generation portfolio. In other words, if the same EGU at baseline that has new regulatory requirements for both its air and water wastestreams chooses to retire rather than adopting control technologies, it would not do so twice, and so the generation lost from that EGU would only need to be replaced once. Hence, simply adding the independently modeled costs of each of the rules, which include effects associated with coal-fired EGU retirements attributable to each rule, would be inappropriate, as these effects are not additive. The sensitivity analysis bears this out over the time periods of relevance to the ELG.[170]

In terms of reductions in coal-fired generating capacity and coal plant closures, affected EGUs are expected to undertake investment decisions to comply with multiple rules simultaneously, as seen in the sensitivity analysis for the combined policy scenario. For example, EGUs that decide to invest in CCS in relevant years may also decide to invest in a dry-handling system, depending on the operational need of the unit. In this case, the costs of CCS and a dry-handling system may be summed. However, if an EGU decides to retire, then the costs associated with the retirement decision would occur only once. For the reasons discussed above, had the Agency done an IPM analysis of ELG impacts in which the other relevant EPA rules were in the baseline, EPA expects that the results of such an analysis would likely show comparable or fewer impacts attributable to the ELG than projected in EPA's main analysis.[171] Thus, nothing in the multi-rule modeling suggests EPA's conclusion that the final ELG rule is economically achievable would be meaningfully different, particularly where courts have upheld EPA's BAT regulations as economically achievable even under circumstances of much greater industry-wide economic impact than projected here. *See Chem. Mfrs. Ass'n* v. *EPA,* 870 F.2d at 252 n.337

[167] IPM is a comprehensive electricity market optimization model that can evaluate such impacts within the context of regional and national electricity markets. See section VIII of this preamble for additional discussion.

[168] Available online at: *https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses-2016.*

[169] Given the design of IPM, unit-level and thereby plant-level projections are presented as an indicator of overall regulatory impact rather than a precise prediction of future unit-level or plant-specific compliance actions. The projected net plant closure occurs at a plant whose only steam electric EGU had a capacity utilization of only six percent in the baseline.

[170] See *IPM Sensitivity Runs Memo* (SE11829) for further details.

[171] The multi-rule run also confirms that resource adequacy is maintained, even taking into account the collective impact of the various EPA rules discussed here. See *Resource Adequacy Analysis: Vehicle Rules, 111 EGU rule, ELG, and MATS Technical MEMO* (SE11830).



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(reviewing cases in which courts have upheld EPA's regulations that projected up to 50 percent closure rates).

Finally, the EPA notes that coal-fired power plants with the wastestreams subject to this final rule are only a fraction of all coal-fired power plants, which are only a fraction of all steam electric power plants subject to part 423. The combination of the screening analysis (including unmanaged CRL and legacy wastewater costs), the IPM market-level results (excluding unmanaged CRL and legacy wastewater costs), and the other considerations in this paragraph support the EPA's conclusion that the rule is economically achievable.

*G. Non-Water Quality Environmental Impacts*

For the 2023 proposed rule, the EPA assessed non-water quality environmental impacts, including energy requirements, air impacts, solid waste impacts, and changes in water use and found them to be acceptable. The EPA reevaluated these impacts in light of the changed industry profile and public comments, as well as the requirements of the final rule. Based on the results of these analyses, the EPA determines that the final rule has acceptable non-water quality environmental impacts. See additional information in section 7 of the Supplemental TDD, as well as section X of this preamble.

*H. Impacts on Residential Electricity Prices and Communities With Environmental Justice Concerns*

The EPA presents the effects of the final rule on consumers as part of the RIA. While the CWA section 304(b)'s ''consideration'' factors do not require these details, the EPA presents them for informational purposes. If all annualized compliance costs were passed on to residential consumers of electricity instead of being borne by the operators and owners of power plants (a conservative assumption), the average yearly electricity bill increase for a typical household would be $1.61 to $3.14 under the final rule, or a change of less than 0.1 percent relative to the baseline. For further information see section 7 of the RIA.

The EPA also presents the effect of the final rule on communities with environmental justice concerns under Executive Order 14096. As explained in sections XIII and XV.J, using demographic data on who resides closest to steam electric power plant discharges, who fishes in downstream waterbodies, and who consumes drinking water from downstream drinking water treatment plants, the EPA concludes that, although benefits are likely to accrue to all members of the affected public, communities with environmental justice concerns will experience health and environmental benefits more than the general population from the reductions in discharges associated with the final rule due to their disproportionate exposure.

## VIII. Costs, Economic Achievability, and Other Economic Impacts

The EPA evaluated the costs and associated impacts of the three main final regulatory options on existing EGUs at steam electric power plants. The Agency analyzed these costs within the context of existing environmental regulations, market conditions, and other trends that have affected steam electric power plant profitability and generation, as described in section V.B of this preamble. This section provides an overview of the methodology the EPA used to assess the costs and the economic impacts and summarizes the results of these analyses. The methodology is largely the same as for the proposed rule analysis, but with updates to reflect more recent data and comments the EPA received on the proposal. See the RIA in the docket for additional detail.

In developing ELGs, and as required by CWA section 301(b)(2)(A), the EPA evaluates the economic achievability of regulatory options to assess the impacts of applying the limitations and standards to the industry as a whole, which typically includes an assessment of incremental plant closures attributable to a regulatory option. As described in more detail below, this supplemental ELG is expected to result in incremental costs when compared to baseline. Like the prior analysis of the 2015 and 2020 rules and the 2023 proposal, the cost and economic impact analysis for this final rule focuses on understanding the magnitude and distribution of compliance costs across the industry and the broader market impacts. The EPA used indicators to assess the impacts of the three regulatory options on the whole steam electric power generating industry. These indicators are consistent with those used to assess the economic achievability of the 2015 and 2020 rules and the 2023 proposal. As was done at proposal, the EPA compared the values to a baseline that reflects implementation of existing environmental regulations (as of this final rule), including the 2020 rule and the effects of the IRA of 2022, but does not include the effects of regulations discussed in section IV.E of this preamble that had not been published at the time of signature of this final rule. As such, the baseline appropriately includes the costs of achieving the 2020 rule limitations and standards, and the policy cases show the impacts resulting from potential changes to the existing 2020 limitations and standards. More specifically, the EPA considered the total cost to the industry and the change in the number and capacity of specific EGUs and plants expected to close under the final rule (Option B) compared to the baseline. The EPA also analyzed the ratio of compliance costs to revenue to see how the three main regulatory options affect how many plants (and their owning entities) exceed thresholds indicating potential financial strain. In addition to the analyses supporting the economic achievability of the regulatory options, the EPA conducted other analyses to (1) characterize other potential impacts of the regulatory options (*e.g.,* on electricity rates) and (2) meet the requirements of Executive Orders or other statutes (*e.g.,* Executive Order 12866, Regulatory Flexibility Act, Unfunded Mandates Reform Act).

*A. Plant-Specific and Industry Total Costs*

The EPA estimated plant-specific costs to control FGD wastewater, BA transport water, CRL, and legacy wastewater discharges at existing EGUs at steam electric power plants to which the ELGs apply.

The EPA assessed the operations and treatment system components currently in place at each unit (or expected to be in place because of other existing regulations, including the 2020 ELG rule), identified equipment and process changes that plants would likely make under each of the three regulatory options presented in table VII–1 of this preamble, considering the subcategory applicable to each EGU, and estimated the capital and O&M costs to implement those changes. As explained in the TDD, the baseline also accounts for additional announced unit retirements, conversions, and relevant operational changes that have occurred since the EPA promulgated the 2020 rule. Following the same methodology used for the 2015 and 2020 rules and the 2023 proposal analyses, when estimating the annualized industry compliance costs, the EPA used a private rate of capital to annualize one-time costs and costs recurring a nonannual basis. For this analysis, this rate is 3.76 percent and represents estimated weighted average cost of capital for the industry. For capital costs and initial one-time costs, the EPA used



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a 20-year amortization period. For O&M costs incurred at intervals greater than one year, the EPA used the interval as the annualization period (*e.g.,* five years, 10 years). The EPA added annualized capital, initial one-time costs, and the nonannual portion of O&M costs to annual O&M costs to derive total annualized plant costs. The EPA estimated after-tax costs based on the type of entity owning each plant. The EPA then calculated total industry costs by summing plant-specific annualized costs.

The EPA proposed that membrane filtration was BAT for FGD wastewater; therefore the Agency continued to rely primarily on the costs of membrane filtration to evaluate economic achievability at proposal while analyzing costs of SDEs and thermal evaporation systems using sensitivity analyses. Comments supportive of zero discharge suggested that sometimes thermal evaporation systems were less costly than membrane filtration systems and that these systems can achieve zero discharge alone or in combination. Other commenters suggested that the EPA's cost estimates were too low. Specifically, commenters suggested that the EPA did not properly reflect the costs of FA diversion to a landfill as part of the proposal's membrane filtration costs.

The EPA has updated its cost estimates to more accurately reflect the costs of FA used for brine encapsulation. As a result of these updates, the EPA estimates that membrane filtration is no longer the least costly FGD treatment technology nationwide.

Furthermore, because the final rule identifies the BAT technology basis for FGD wastewater as membrane filtration, SDEs, and thermal evaporation systems alone or in combination, the EPA performed a least-cost analysis to determine which technology each plant would select. While the EPA costed all three technologies, the cost estimates for thermal technologies contain CBI and cannot be released publicly.[172] To increase transparency of this final rule, the EPA ran an alternative set of costs selecting the least-cost technology between only membrane filtration and SDEs. The EPA found that only six plants would select thermal evaporation systems as the lowest cost option when considering all three technologies. Moreover, when comparing the least-cost analysis among the three technologies to the least-cost analysis with only membrane filtration and SDEs, the EPA found that the overall costs associated with the latter exceed the former by only five percent. Since the non-CBI costs do not substantially differ from the CBI costs, the EPA ran these non-CBI costs through IPM so that model's inputs and outputs could also be made public.

With respect to BA transport water, the 2020 rule record never demonstrated that a full 10 percent purge at all facilities was a realistic costing assumption. The primary basis for the 2020 rule purge allowance was a 2016 report from EPRI that involved continuous purges, the majority of which were well under one percent. Thus, in the 2020 rule record, the EPA presented a sensitivity analysis with costs for a two percent purge treatment, which better reflect the handful of facilities for which the EPA has record evidence of a purge.

At proposal, the EPA retained this dual costing approach. Based on IPM modeling results, including the 10 percent purge treatment cost estimates, the EPA proposed to find that dry-handling or closed-loop systems are economically achievable. The EPA received comments suggesting that a 10 percent purge is not realistic of the potential purge needs of facilities. EPA agrees that the record reflects very few facilities with demonstrated purge needs, and that these were all two percent or less. Thus, the Agency has now adopted the more realistic two percent purge treatment cost estimate as its primary analysis but has retained the 10 percent purge treatment costs as a sensitivity analysis.[173]

With respect to CRL, the EPA proposed to establish limitations based on chemical precipitation systems but estimated the costs of alternative zero-discharge systems for treating CRL in a separate memorandum. Some commenters asked the EPA to repropose CRL limitations since these analyses were not presented as part of the main regulatory options. Commenters also presented various reasons why they believed that the EPA's cost estimates were too low. Specifically, commenters suggested that the EPA did not properly reflect the costs of fly ash diversion to a landfill as part of the proposal's membrane filtration costs.

The EPA disagrees with commenters that it should repropose CRL limitations because costs and pollutant loadings of additional technologies were estimated in a separate document. The Agency provided commenters with a fair opportunity to present their views on the contents of the final rule, which is all that is required to satisfy notice and comment requirements. *BASF Wyandotte Corp.* v. *Costle,* 598 F.2d 637, 641–644 (1st Cir. 1979) (rejecting notice and comment objections to a final ELG rule based on changes from proposal). The EPA has also updated its cost estimates to reflect more accurate costs of using FA for brine encapsulation as was done for FGD wastewater in section VII.B.1 of this preamble.

With respect to unmanaged CRL, the proposed rule included a bounding sensitivity analysis with costs for every facility and every unlined landfill and surface impoundment (WMU) to treat their unmanaged CRL either with chemical precipitation or SDEs. These bounding analyses were presented as a conservative estimate to demonstrate the potential universe of discharges of unmanaged CRL and potential costs. Some commenters stated their view that the EPA had not sufficiently evaluated unmanaged CRL and argued that the EPA should re-propose CRL limits after conducting a more accurate costing analysis. The EPA also received comments disagreeing with two misunderstandings of the Agency's proposed application of the rule to unmanaged CRL, with commenters believing either all or none of the facilities in the Agency's analyses were covered. One commenter further suggested that the EPA should include additional WMUs under the new CCR proposed rule (88 FR 31982).

The EPA disagrees with commenters that it did not sufficiently evaluate unmanaged CRL and that CRL limits should be re-proposed. The proposed rule gave commenters notice of the basic engineering cost and economic screening approaches that the Agency applied in evaluating discharges of unmanaged CRL for the final rule, as those approaches have not changed. Furthermore, at proposal, the EPA analysis included the broadest set of potential facilities and WMUs estimated to be potentially subject to these limitations to ensure that the public was given fair notice of how the final rule could apply, even in cases where such an application might be highly unlikely. The EPA disagrees with commenters that making this assumption for the purposes of a bounding analysis had any implications as to whether a permitting authority would ultimately find the existence of a point source with

[172] Standard thermal evaporation system costs are analyzed in DCN SE11694 but not included in this least cost analysis because portions of those costs are being treated as CBI pursuant to claims made by vendors under the EPA's CBI regulations.

[173] This primary use of the two percent numbers is also more reasonable when considering the definitional change whereby necessary discharges from storm events are not considered BA transport water, and thus would not require any additional purge or purge treatment.



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a functional equivalent direct discharge to a WOTUS at any given WMU.

For the final rule, to better reflect on-the-ground reality, and in response to public comment, the EPA has refined the bounding analyses from proposal to remove the WMUs least likely to incur costs under this final rule. The EPA began by compiling groundwater monitoring information from unlined WMUs reported under the CCR regulations. This information consisted of detection monitoring data, assessment monitoring data, statistical analyses, and other narrative discussion in the groundwater monitoring reports. WMUs which are still in detection monitoring, and where there is either no statistically significant increase (SSI) of specified parameters [174] above the groundwater background, or an increase that is not attributable to the WMU, are the least likely to be sources of pollutants and therefore also the least likely to potentially incur treatment costs under the rule. Thus, the EPA excluded these units from its revised bounding analysis.

In addition to the updated bounding analysis, for the final rule, also in response to public comments, the EPA now presents a range of more likely costs consisting of a revised upper bound and revised lower bound analysis. These lower and upper bounds provide a likely more accurate range of cost estimates and other impacts for treating unmanaged CRL. The revised upper bound estimate probabilistically considers three separate scenarios, described in the next paragraph. The revised lower bound estimate probabilistically considers an additional four scenarios, also described below. Together, the resulting range represents a reasonable range of nationwide costs of treatment for unmanaged CRL, but as discussed in the following paragraphs, it could overestimate costs at some facilities and underestimate costs at others.

The revised upper bound cost estimate uses proxies for the factors that make unmanaged CRL more likely to be subject to the limitations in the final rule, and therefore more likely to incur costs. The first scenario the EPA modeled was one in which unmanaged CRL treatment costs are assigned only to each plant's WMU closest to a surface waterbody. The Supreme Court in *County of Maui* recognized the importance of distance in determining whether a discharge might fall within the CWA's jurisdiction. *County of Maui* v. *Hawaii Wildlife Fund,* 590 U.S. at 184. For any given facility, for purposes of this cost estimate, the EPA assumes that the unlined WMU that is most likely to have unmanaged CRL subject to this rule's limitations is the unlined WMU nearest a surface waterbody. In selecting the nearest such WMU for the purposes of analysis, the EPA is not making any findings that these unmanaged CRL discharges would be subject to the final rule requirements or that discharges from other WMUs would not be. In reality, WMUs further from a surface waterbody could be found to be point sources with FEDDs of CRL to a WOTUS which are subject to CWA permitting. In addition, any of the closest WMUs modeled here may be found not to be point sources with FEDDs of CRL and thus subject to CWA permitting. Nevertheless, the EPA finds that it is reasonable to assume that the closest WMUs are more likely to incur costs under this final rule.

The other two scenarios the EPA modeled focused not on distance, but on which WMUs are more likely to be a source of pollutants. For these WMUs, the Agency estimated costs of chemical precipitation treatment at both the WMU level and at the facility level. As discussed in the preceding paragraphs, the EPA's updated bounding analysis already removed those WMUs with less probability of incurring costs for unmanaged CRL treatment due to the absence of a WMU-caused SSI in detection monitoring pollutants (*e.g.,* TDS). Just because a facility finds an SSI for a detection monitoring parameter does not indicate that it will incur costs under this final rule. This final rule imposes mercury and arsenic limitations based on chemical precipitation, a treatment system that does not treat all pollutants which might be found in TDS and other detection monitoring parameters. Instead, the EPA notes that nearly all of the assessment monitoring pollutants in appendix IV to part 257 are pollutants treated by chemical precipitation. The EPA finds that WMUs that are the source for an SSI of one or more appendix IV pollutants, and thus trigger corrective action under the CCR regulations, are the most likely to incur chemical precipitation-related costs under this final rule. This is so for two reasons.

First, there is the possibility that these facilities could, in the future, select a pump-and-treat remedy under the corrective action requirements of the CCR regulation, which will be discharged. Any resulting direct discharge would need to comply with the limits in this rule. Second, where a pump-and-treat remedy is not selected, the EPA examined treatment of arsenic. Arsenic has historically been one of the most prevalent pollutants in CCR damage cases and under this final rule is also one of the two indicator pollutants monitored to demonstrate compliance with the BAT limitations for discharges of unmanaged CRL. While this regulation establishes technology-based limitations, the daily and monthly arsenic limitations being finalized are very close to, and bracket, the health-based arsenic standard in the CCR regulations.[175] Thus, for purposes of determining the facilities and WMUs most likely to incur costs with respect to unmanaged CRL, the EPA finds that focusing on arsenic is reasonable.

While the EPA believes that using WMUs that have triggered corrective action is a reasonable proxy for estimating WMUs most likely to incur costs associated with unmanaged CRL under this rule, EPA notes that here too, just because a facility is in corrective action for its groundwater contamination does not mean that the WMU at issue would necessarily be found to be a point source with a FEDD of CRL to a WOTUS. Thus, in some cases, these costs will be overestimated for specific facilities. At the same time, it may be possible that unmanaged CRL is subject to CWA permitting but does not trigger corrective action under the CCR regulations.

Due to the uncertainties surrounding future permitting authority findings regarding unmanaged CRL, the EPA probabilistically combined the three cost scenarios discussed above with equal weights: those involving (1) each plant's closest WMU, (2) cases of corrective action at the WMU level, and (3) cases of corrective action where surface impoundment flows are combined at the facility level. These modeling assumptions should not be interpreted as a finding that any specific site is subject to the unmanaged CRL limitations in the final rule. Rather, these assumptions should be considered as assisting in a reasonable estimation of costs nationwide, with actual site-specific costs under- or overestimated.

[174] Appendix III to Part 257—Constituents for Detection Monitoring includes TDS.

[175] The daily and monthly BAT limitations being established are 11 ug/L and 8 ug/L, respectively as compared to the maximum contaminant level of 10 ug/L, which is the trigger for corrective action under the CCR regulations.



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The revised lower bound cost estimate uses proxies for the factors that make unmanaged CRL most likely to be subject to the limitations in the final rule, and therefore most likely to incur costs. Specifically, as of January 22, 2022, the EPA was aware of 67 WMUs at 38 facilities which had selected corrective action remedies that includes pumping and treating of groundwater now or in the future.[176] These data are summarized in table VIII–1 below.

**Table VIII-1. CCR Corrective Action Remedies Selected by 2021**

| Unit/Facility | Count | Pump & Treat | GW Extraction/ Collection | Both | Pump & Treat % | Both % |
|---|---|---|---|---|---|---|
| Individual LFs | 18 | 3 | 2 | 5 | 17% | 28% |
| Individual Sis | 49 | 11 | 6 | 17 | 22% | 35% |
| Facilities w/LFs | 16 | 3 | 2 | 5 | 19% | 31% |
| Facilities w/Sis | 26 | 2 | 4 | 6 | 8% | 23% |

* Notes: LF = landfill; SI = surface impoundment; Facility counts add to 42 rather than 38 because four facilities have both landfills and surface impoundments

While the statistics are based on a 2022 subset of the facilities that have selected corrective action remedies thus far or will select corrective action remedies in the future, this empirical data provides the best available information on which to base the fraction of WMUs or facilities that may ultimately select a remedy that generates a CRL wastestream that could potentially be discharged, and thus potentially incur treatment costs under the final rule. While some of these facilities selected a remedy that explicitly included pump-and-treat operations, others included other categories of groundwater extraction or collection that may or may not ultimately result in a discharge. The EPA probabilistically used four scenarios to account for the uncertainty in the likelihood of a discharge that would incur ELG compliance costs.

Two scenarios relied on the fraction of WMUs where such discharges were possible based on the remedy selected. Due to the number of WMUs at different facilities being unequal, the EPA also evaluated two scenarios that instead relied on the fraction of facilities with landfills and the fraction of facilities with surface impoundments where such discharges were possible. For each of these, a pair of estimates was generated assuming the fraction that would ultimately discharge subject to the ELG would include either only the pump-and-treat operations or, alternatively, both pump-and-treat operations and other remedies with groundwater collection or extraction that could potentially discharge in the future. For the two scenarios using the facility-based extrapolation, the EPA used the costs for facility-wide corrective action described as one scenario in the revised upper bound scenario in the preceding paragraphs. Finally, by treating each of these scenarios with an equal likelihood to occur, the revised lower bound estimate avoids attaching too much certainty to any individual estimate based on this data set.

The EPA notes that the revised upper bound analysis still represents a conservative estimate of the costs for unmanaged CRL. As facilities continue to implement the CCR regulations, landfills and surface impoundments continue to close and conduct corrective action. In some cases, closure may eliminate the continued source of pollutants (*e.g.,* WMUs which are clean closed) or may reduce the concentrations of pollutants, making treatment costs under this final ELG less likely. Furthermore, where corrective action is taken pursuant to the CCR regulations, it is possible that the corrective action selected would reduce the probability that the facility would incur costs under the final rule. This could be the result of installing impermeable or semi-permeable barriers, conducting *in-situ* treatment, or undergoing pump-and-treat operations where the water is returned to the ground rather than discharged. Even where unmanaged CRL in groundwater is pumped to the surface, some of that water may be reused within the plant or treated and returned to the ground. When considered against this backdrop, the revised upper bound costs estimated for unmanaged CRL can be considered a reasonable, conservative estimate for purposes of ensuring that these costs are considered and found to be economically achievable.

Similarly, the revised lower bound analysis still represents a likely underestimate of the costs of unmanaged CRL. Once regulations establishing a Federal CCR permit program are finalized, the EPA or state agencies may find that some previously selected corrective action remedies may not satisfy the corrective action requirements under the CCR regulations and, thus, a new remedy which does result in a discharge could be required. Furthermore, it may be possible that some unmanaged CRL satisfying the health-based requirements of the CCR regulations could still result in a FEDD of CRL into a WOTUS and, therefore, incur costs for complying with the ELG. For these reasons, the EPA believes the ultimate costs and economic impacts associated with unmanaged CRL are most likely to fall between the revised upper bound and revised lower bound estimates evaluated in the Agency's cost and economic analyses.

With respect to legacy wastewater, the EPA proposed to retain the existing case-by-case limitations but estimated the costs of alternative treatment systems for treating legacy wastewater in a separate memorandum at proposal. Some commenters asked the EPA to repropose legacy wastewater limitations since these analyses were not presented as part of the main regulatory options. The EPA disagrees with commenters for the same reasons presented in the CRL discussion immediately above. For the subcategory of surface impoundments continuing to operate after the effective

[176] EPA presents this dataset in DCN SE11501.



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date of the rule, the EPA expects that many plants may only close and dewater their ponds after 2049, which is outside of the period of analysis (and thus, for the purposes of this analysis, would be zero). The Agency has also evaluated a worst-case scenario where all plants close and dewater their ponds soon after the final rule is effective (see RIA appendix C). These costing scenarios bound the potential costs of the final subcategory; however, the likely costs fall somewhere in between. While the EPA cannot know with certainty when a surface impoundment may be closed in the future, the Agency compiled data in the 2015 CCR rule record which revealed a median operating life of 40 years for a surface impoundment [177] and this 40-year life was used for estimating costs, benefits, and other impacts in *Regulatory Impact Analysis for EPA's 2015 Coal Combustion Residuals Final Rule.* To ensure that the costs of the final legacy wastewater subcategory were included in the Agency's main cost analyses, the Agency assumed that these costs would be incurred in 2044. This corresponds to 20 years after the effective date of the final rule (*i.e.,* half of a useful operating life).[178]

Pre-tax annualized costs provide insight on the total expenditure as incurred, while after-tax annualized costs are a more meaningful measure of impact on privately owned for-profit entities and incorporate approximate capital depreciation and other relevant tax treatments in the analysis. The EPA uses pre- and/or after-tax costs in different analyses, depending on the concept appropriate to each analysis (*i.e.,* social costs are calculated using pre-tax costs whereas cost-to-revenue screening-level analyses are conducted using after-tax costs).

The after-tax annualized costs of the final rule range between $479 million and $956 million for the lower and upper bound cost scenarios, respectively, whereas the pre-tax annualized costs range between $596 million and $1,164 million.

[177] See section 4.3.1 of *Human and Ecological Risk Assessment of Coal Combustion Residuals.*

[178] Assuming the same 40-year surface impoundment operating life used in the 2015 CCR rule record and acknowledging that these impoundments could be anywhere in that 40-year lifespan, the Agency uses the midpoint of 20-years as a reasonable approximation for purposes of ensuring that these costs are included in the main cost analyses of the final rule. To the extent that costs could be incurred before this date at some facilities and after this date at other facilities, these nationwide costs may either over- or underestimate the site-specific costs at any particular facility.

*B. Social Costs*

Social costs are the costs of the supplemental ELG from the viewpoint of society as a whole, rather than the viewpoint of regulated plants and owning entities (which are private costs). They include costs incurred by both private entities (*e.g.,* in complying with the regulation) and by the government (*e.g.,* in implementing the regulation). To calculate social costs, the EPA tabulated the pre-tax costs in the year they are estimated to be incurred, which varies across plants based on the estimated compliance year. The EPA performed the social cost analysis over a 25-year period of 2025 to 2049, which combines the length of the period during which plants are anticipated to install the control technologies (which could be as late as 2029) and the useful life of the longest-lived technology installed at any plant (20 years). The EPA calculated the social cost of the final rule using a two percent discount rate, following current OMB guidance in Circular A–4.[179]

As described further in section 10 of the RIA, there are no incremental increases in the cost to state governments to revise NPDES permits. Consequently, the only category of costs used to calculate social costs are those pre-tax costs estimated for steam electric power plants. Note that the annualized social costs differ from pre-tax industry compliance costs discussed in section VIII.A of this preamble due to differences in both the discount rate used (2 percent) and the year-explicit accounting of the costs. Whereas the costs in section VIII.A of this preamble represent the annualized costs of each option if they were incurred in 2024, the annualized social costs are estimated based on the stream of future costs starting in the year that individual plants are projected to comply with the requirements of the final rule. The final rule has estimated annualized incremental social costs of $536 million to $1,064 million.

*C. Economic Impacts*

The EPA assessed the economic impacts of this final rule in two ways: (1) a screening-level assessment of the cost impacts on existing EGUs at steam electric power plants and the entities that own those plants, based on a comparison of costs to revenue and (2) an assessment of the impacts within the context of the broader electricity market, which includes an assessment of changes in predicted plant closures attributable to the final rule. The following sections summarize the results of these analyses. The RIA discusses the methods and results in greater detail.

The first set of cost and economic impact analyses—at both the plant and parent company level—provides screening-level indicators of the impacts of costs for FGD wastewater, BA transport water, and CRL controls relative to historical operating characteristics of steam electric power plants incurring those costs (*i.e.,* level of electricity generation and revenue).[180] The EPA conducted these analyses for baseline and for the three regulatory options presented in table VII–1 of this preamble, then compared these impacts to understand the incremental effects of the regulatory options, including the final rule (Option B).

The second set of analyses looks at broader electricity market impacts, considering the interconnection of regional and national electricity markets. This analysis also looks at the distribution of impacts at the plant and EGU level. This second set of analyses provides insight on the impacts of the final rule on steam electric power plants, as well as the entire electricity market, including changes in capacity, generation, and wholesale electricity prices. The market analysis compares model predictions for the final rule to a base case that includes the predicted and observed economic and market effects of the 2020 rule and other environmental regulations.

1. Screening-Level Assessment

The EPA conducted a screening-level analysis of each regulatory option's potential impact on existing EGUs at steam electric power plants and parent entities based on cost-to-revenue ratios. For each of the two levels of analysis (plant and parent entity), the Agency assumed, for analytic convenience and as a worst-case scenario, that none of the compliance costs would be passed on to consumers through electricity rate increases and would instead be absorbed by the steam electric power plants and their parent entities. This assumption overstates the impacts of compliance expenditures since steam electric power plants that operate in a regulated market may be able to pass on changes in production costs to

[179] OMB (2023). Circular A–4: Regulatory Analysis. Washington DC. Available at *https://www.whitehouse.gov/wp-content/uploads/2023/11/CircularA-4.pdf.*

[180] As discussed in section VIII.A of this preamble, in analyzing the costs and benefits of the final rule, the EPA estimated that the costs to meet future legacy wastewater limitations would occur outside the period of analysis and therefore focused on the FGD wastewater, BA transport water and CRL wastestreams for this analysis.



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consumers through changes in electricity prices. It is, however, an appropriate assumption for a screening-level estimate of the potential cost impacts.

a. Plant-Level Cost-to-Revenue Analysis

The EPA developed revenue estimates for this analysis using EIA data. The EPA then calculated the change in the annualized after-tax costs of the three regulatory options presented in table VII–1 of this preamble as a percentage of baseline annual revenues. See section 4 of the RIA for a more detailed discussion of the methodology used for the plant-level cost-to-revenue analysis.

Cost-to-revenue ratios are screening-level indicators of potential economic impacts. For this analysis, the EPA assessed plants incurring costs below one percent of revenue as unlikely to face economic impacts, plants with costs between one percent and three percent of revenue as having a higher chance of facing economic impacts, and plants incurring costs above three percent of revenue as having a still higher probability of economic impact.

Under the final rule (Option B), the EPA estimates that 50 to 72 plants would incur incremental costs greater than or equal to one percent of revenue under the lower and upper bound cost scenarios respectively, including 18 to 31 plants that have costs greater than or equal to three percent of revenue. An additional 91 to 98 plants would incur costs that are less than one percent of revenue. section 4.2 in the RIA provides results for the other regulatory options the EPA analyzed.

b. Parent Entity-Level Cost-to-Revenue Analysis

The EPA also assessed the economic impact of the regulatory options presented in table VII–1 of this preamble at the level of the firm that own steam electric power plants to analyze the potential impacts on these firms, referred to as ''parent entities.'' In this analysis, the domestic parent entity associated with a given plant is defined as the entity with the largest ownership share in the plant. For each parent entity, the EPA compared the incremental change in the total annualized after-tax costs and the total revenue for the entity to the baseline (see section 4 of the RIA for details). Following the methodology employed in the analyses for the 2015 and 2020 rules, the EPA considered a range of estimates for the number of entities owning an existing EGU at a steam electric power plant to account for partial information available for steam electric power plants that are not expected to incur ELG compliance costs.

Like the plant-level analysis above, cost-to-revenue ratios provide screening-level indicators of potential economic impacts, this time to the owning entities; higher ratios suggest a higher probability of economic impacts. The EPA estimates that the number of entities owning existing EGUs at steam electric plants ranges from 220 (lower-bound estimate) to 391 (upper-bound estimate), depending on the assumed ownership structure of plants not incurring ELG costs and not explicitly analyzed. The EPA estimates that under the final rule (Option B) and for the lower and upper bound cost scenarios, 13 to 17 parent entities would incur annualized costs representing one percent or more of their revenues, including 6 to 9 parent entity that would incur costs representing more than three percent of its revenue.

2. Electricity Market Impacts

To analyze the impacts of regulatory actions on the electric power sector, the EPA commonly uses IPM, a comprehensive electricity market optimization model that can evaluate such impacts within the context of regional and national electricity markets. The model is designed to evaluate the effects of changes in EGU-level electric generation costs on the total cost of electricity supply, subject to specified demand and emissions constraints. Use of a comprehensive market analysis system is important in assessing the potential impact of any power plant regulation because of the interdependence of EGUs that supply power to the electric transmission grid. Changes in electricity production costs at some EGUs can have a range of broader market impacts affecting other EGUs, including the average likelihood that various units are dispatched. The analysis also provides important insight on steam electric capacity closures (*e.g.,* retirements of EGUs that become uneconomical relative to other EGUs), based on a more detailed analysis of market factors than in the screening-level analyses above.

In contrast to the screening-level analyses, which are static and do not account for the interdependence of EGUs supplying power to the electric transmission grid, IPM accounts for potential changes in the generation profile of steam electric and other EGUs, as well as the consequent changes in market-level generation costs as the electric power market responds to changes in generation costs for steam electric EGUs due to the regulatory options. Additionally, in contrast to the screening-level analyses, in which the EPA assumed no cost pass-through of ELG compliance costs, IPM depicts production activity in wholesale electricity markets where the specific increases in electricity prices for individual markets would result in some recovery of compliance costs for plants. IPM is based on an inventory of U.S. utility- and nonutility-owned EGUs and generators that provide power to the integrated electric transmission grid, including plants to which the ELGs apply.

The EPA analyzed the final rule (Option B) using IPM to further inform the Agency's understanding of the potential impacts of the ELGs. The base case used for this analysis, which the EPA was developed using IPM Version 6, embeds an energy demand forecast that is derived from DOE's ''Annual Energy Outlook 2023.'' [181] The base case also includes the effects of the IRA provisions reflecting supply-side impacts, final Federal rules (*e.g.,* 2020 ELG rule, CSAPR and CSAPR Update, 2012 MATS rule, the 2014 CWA section 316(b) rule, and 2015 CCR rule and CCR Part A rule), and state rules and programs such as the Regional Greenhouse Gas Initiative, California's Global Warming Solutions Act, and state-level Renewable Portfolio Standards policies.

In analyzing the final rule, the EPA estimated incremental fixed and variable costs for the steam electric power plants and EGUs to comply with Option B. Because IPM is not designed to endogenously model the selection of wastewater treatment technologies as a function of electricity generation, effluent flows, and pollutant discharge, the EPA estimated these costs exogenously for each steam EGU and input these costs into the IPM model as fixed and variable O&M cost adders in addition to the costs already reflected in the base case, which included compliance with the 2020 ELG rule (the baseline analysis) and other applicable regulations. The EPA then ran IPM with these new cost estimates to determine the dispatch of EGUs that would meet projected demand at the lowest costs, subject to the same constraints as those in the baseline analysis. The estimated changes in plant- and EGU-specific production levels and costs—and, in turn, changes in the electric power sector's total costs and production profile—are key data elements in evaluating the expected national and regional effects of the final rule,

[181] U.S. Energy Information Administration (2023b). Annual Energy Outlook 2023. Available at *https://www.eia.gov/outlooks/aeo/.*



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including closures or avoided closures of EGUs and plants.

The EPA considered impact metrics of interest at three levels of aggregation: (1) impact on national and regional electricity markets (all electric power generation, including steam and nonsteam electric power plants); (2) impact on steam electric power plants as a group, and (3) impact on individual steam electric power plants incurring costs. section 5 of the RIA discusses the first analysis; the sections below summarize the last two, which are further described in section 5 of the RIA. All results presented below are representative of modeled market conditions in the model year 2035, when the plants will have implemented changes to meet the revised ELGs.

a. Impacts on Existing Steam Electric Power Plants

The EPA used IPM results for 2035 to assess the potential impact of the final rule on existing EGUs at steam electric power plants. The purpose of this analysis is to assess any fleetwide changes from baseline impacts on EGUs at steam electric plants. Table VIII–2 of this preamble reports estimated results for existing EGUs at steam electric power plants, as a group. EPA looked at the following metrics: (1) incremental early retirements and capacity closures, calculated as the difference between capacity under the regulatory option and capacity under the baseline; (2) incremental capacity closures as a percentage of baseline capacity; (3) changes in electricity generation from plants subject to the ELGs; (4) changes in variable production costs per MWh, calculated as the sum of total fuel and variable O&M costs divided by net generation; and (5) changes in annual costs (fuel, variable O&M, fixed O&M, and capital). Items (1) and (2) provide important insight for determining the economic achievability of the ELG rule. Note that changes in electricity generation at steam electric power plants presented in table VIII–2 are attributable both to changes in retirements and changes in capacity utilization at operating EGUs and plants.

**Table VIII-2. Estimated Impact of the Final Rule (Option B) on Steam Electric Power Plants as a Group in the Year 2035**

| Metric | Baseline Value | Change Attributable to the Final Rule as Compared to the Baseline | |
|---|---|---|---|
| | | Value | Percent |
| Total capacity (MW) | 220,237 | -5,782 | -2.6% |
| Early retirement or closure (MW) | 104,544 | 5,782 | 5.5% |
| Early retirement or closure (number of plants) | 78 | 5 | 6.4% |
| Total generation (GWh) | 789,529 | -23,579 | -3.0% |
| Average variable production cost (2023$/MWh) | $20.18 | -$0.21 | -1.1% |
| Annual cost (million 2023$) | $28,580 | -$840 | -2.9% |

MW = megawatt; MWh = megawatt-hour; GWh = gigawatt-hour = 1,000 MWh

Under the final rule, generation at steam electric power plants is projected to decrease by 23,579 GWh (3.0 percent) nationally when compared to baseline. IPM projects a net decline in total steam electric capacity by 5,782 MW (approximately 2.6 percent of total baseline steam electric capacity) due to early retirement attributable to this final rule. Five additional plants are projected to retire early under the final rule when compared to baseline. These incremental early retirements represent a 6.4 percent increase relative to projected baseline plant retirements, but only represent 0.7 percent of the total 688 steam electric power plants modeled in IPM. See section 5.2.2.2 in the RIA for details.

These findings suggest that the final rule can be expected to have small economic consequences for steam electric power plants as a group. Option B would affect the operating status of very few steam electric power plants, with five projected additional plant closures (including one plant that was not estimated to incur costs under Option B).

b. Impacts on Individual Plants Incurring Costs

To assess potential plant-level effects, the EPA also analyzed plant-specific changes attributable to the final rule for the following metrics: (1) capacity utilization (defined as annual generation (in MWh) divided by the product of capacity (MW) and 8,760 hours), (2) electricity generation, and (3) variable production costs per MWh, defined as variable O&M cost plus fuel cost divided by net generation. The analysis of changes in individual plants is detailed in section 5 of the RIA. The results indicate that most plants would experience only slight effects—*i.e.,* no change or a reduction/increase of less than one percent. Across the full set of steam electric power plants modeled, 36 plants would incur a reduction in generation of at least one percent; 17 of these plants are also estimated to incur a reduction in capacity utilization of at least one percent. At the same time, 21 plants would increase generation by at least one percent, and 10 plants see their capacity utilization increase by at least one percent. Of the subset of 35

steam electric power plants that were estimated to incur costs under the final rule (Option B), four plants would incur a decrease in generation, whereas four plants would see either no change or an increase in generation. Moreover, 13 plants for which the EPA estimated costs are projected to close in the baseline scenario, and four additional plants are projected to close under the final rule (Option B).

## IX. Pollutant Loadings

In developing ELGs, the EPA typically evaluates the pollutant loading reductions of the final rule to assess the impacts of the compliance requirements on discharges from the whole industry. The EPA took the same approach to the one described above for plant-specific costs for estimating pollutant reductions associated with this rule. That is, the EPA compared the values to a baseline that reflects implementation of existing environmental regulations, including the 2020 rule for FGD wastewater and BA transport water.

The general methodology that the EPA used to calculate pollutant loadings is the same as that described in the 2020 rule. The EPA first estimated—on an annual, per plant basis—the pollutant discharge load associated with the technology bases evaluated for plants to comply with the 2020 rule requirements for FGD wastewater and BA transport water, accounting for the current or planned conditions at each plant. For CRL and legacy wastewater, the EPA estimated the pollutant discharge load associated with current discharges. For all wastestreams, the EPA similarly estimated plant-specific post-compliance pollutant loadings as the load associated with the technology bases for plants to comply with the effluent limitations in this rule. The EPA then calculated the changes in pollutant loadings at a particular plant as the sum of the differences between the estimated baseline and post-compliance discharge loadings for each applicable wastestream.

For plants that discharge indirectly to POTWs, the EPA adjusted the baseline and option loadings to account for pollutant removals expected from POTWs. These adjusted pollutant loadings for indirect dischargers therefore reflect the resulting discharges to receiving waters. For details on the methodology the EPA used to calculate pollutant loading reductions, see section 6 of the TDD.

### *A. FGD Wastewater*

For FGD wastewater, the EPA continued to use the average pollutant effluent concentration with plant-specific discharge flow rates to estimate the mass pollutant discharge per plant for the baseline and the final rule. EPA used data compiled for the 2015 and 2020 rules as the initial basis for estimating discharge flow rates and updated the data to reflect retirements or other relevant changes in operation. As in the 2020 rule, the EPA also accounted for increased rates of recycle through the scrubber that would affect the discharge flow.

The EPA assigned pollutant concentrations for each analyte based on the operation of a treatment system designed to comply with baseline or the final rule. The EPA used data compiled for the 2020 rule to characterize FGD chemical precipitation plus LRTR effluent and chemical precipitation plus membrane filtration effluent. In addition, the EPA used data provided by industry and other stakeholders during the 2020 rule and 2023 proposed rule, as described in section IV of this preamble, to quantify bromide in FGD wastewater under baseline conditions and the final rule.

### *B. BA Transport Water*

The EPA estimated baseline and post-compliance loadings for the final rule using pollutant concentrations for BA transport water and plant-specific flow rates. The EPA used data compiled for the 2020 rule as the basis for estimating BA transport water discharge flows and updated the data set to reflect retirements and other relevant changes in operation (*e.g.,* ash handling conversions, fuel conversions) that have occurred since collecting the 2020 rule data. Under the baseline, which reflects the 2020 rule requirement for the high recycle rate technology option (or BMP plan in the case of Merrimack Station), the EPA estimated discharge flows associated with the purge from remote MDS operation, based on the generating unit capacity and the volume of the remote MDS. Under the zero-discharge option, the EPA estimated a flow rate of zero.

### *C. CRL*

For CRL, the EPA used the average pollutant effluent concentration with plant-specific discharge flow rates to estimate the mass pollutant discharge per plant for baseline and the final rule. The EPA used data compiled for the 2015 rule as the initial basis for estimating discharge flow rates and updated the data to reflect retirements. The EPA also used utilities' ''CCR Rule Compliance Data and Information'' websites to identify new landfills constructed since 2015 and waste management units that may discharge unmanaged CRL. For new landfills, the EPA used the 2015 methodology to estimate leachate flow proportionate to landfill size, if available, or as the median leachate volume (in gallons per day) calculated from the 2010 steam electric survey. For plants with EGUs no longer burning coal by 2034 (*e.g.,* retired, converted EGUs to natural gas), the EPA adjusted CRL discharge flow rates to account for an expected decrease in CRL volume following the closure of the waste management unit. For discharges of unmanaged CRL, the EPA estimated the volume of leachate-laden groundwater captured from pumping systems that draw down the groundwater elevation along the hydraulically downgradient cross-sectional width of the CCR management unit.

The EPA assigned pollutant concentrations for each analyte based on current operating conditions or treatment in place for the baseline and the operation of a treatment system designed to comply with the final rule. The EPA used data compiled for the 2015 rule, in addition to data gathered as part of this rulemaking (see section VI.A.3 of this preamble), to characterize untreated CRL. Consistent with its methodology for the 2015 rule, the EPA evaluated the new CRL data for use in the untreated CRL analytical dataset and incorporated the data acceptable for the loadings analyses (see section 6.4 of the TDD for more information). The EPA transferred the average FGD effluent concentrations for chemical precipitation, as it did in the 2015 rule.

### *D. Legacy Wastewater*

The EPA estimated baseline and post-compliance loadings for the final rule using pollutant concentrations for legacy wastewater and plant-specific flow rates. The EPA used utilities' ''CCR Rule Compliance Data and Information'' websites to estimate the volume and type of CCR and water stored in impoundments. The EPA estimated the volume of impounded water (*i.e.,* decant wastewater) and dewatering wastewater for each impoundment primarily using information from the annual inspection reports. To estimate the flow rate, the EPA divided the total volume of legacy wastewater by the closure duration, specified in utilities' closure plans or estimated based on permit cycles. For surface impoundments where the total wastewater volume was unknown, the EPA used the median total estimated volume of wastewater from the impoundments in its analysis and a closure duration of seven years.

The EPA used 2015 rule surface impoundment effluent concentration

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data sets to estimate baseline loadings as each impoundment in the population varies in the CCR material it contains, including FA, BA, combined ash, and FGD wastewater. The EPA transferred the average FGD effluent concentrations for chemical precipitation, as it did with CRL.

*E. Summary of Incremental Changes of Pollutant Loadings from the Final Rule*

Compared to the 2020 rule (baseline), the final rule results in a reduction of 656 million pounds of pollutants to surface waters annually. The EPA estimates pollutant removals associated with discharges of unmanaged CRL could amount to between 3.62 and 16.4 million pounds annually. See section VII.C.5 of this preamble for more information regarding the subcategory for discharges of unmanaged CRL.

**X. Non-Water Quality Environmental Impacts**

The elimination or reduction of one form of pollution may create or aggravate other environmental problems. Therefore, sections 304(b) and 306 of the CWA require the EPA to consider non-water quality environmental impacts (including energy requirements) associated with ELGs. Accordingly, the EPA has considered the potential impacts of this rule on air emissions, solid waste generation, and energy consumption. In general, to conduct this analysis, the EPA used the same methodology (with updated data as applicable) as it did for the analyses supporting the 2015 and 2020 rules. The following sections summarize the methodology and results. See section 7 of the supplemental TDD for additional details.

*A. Energy Requirements*

Steam electric power plants use energy when transporting ash and other solids on or off site, operating wastewater treatment systems (*e.g.,* chemical precipitation, membrane filtration, SDEs), or operating ash handling systems. For this final rule, the EPA considered whether there would be an associated change in the incremental energy requirements compared to the baseline. The EPA estimated the increase in energy usage in MWh for equipment added to the plant systems or in gallons of fuel consumed for transportation/operating equipment and summed the facility-specific estimates to calculate the net change in energy requirements from the baseline for the final rule.

The EPA estimated the amount of energy needed to operate wastewater treatment systems and ash handling systems based on the horsepower ratings of the pumps and other equipment. The EPA also estimated any changes in the fuel consumption associated with transporting solid waste and combustion residuals (*e.g.,* ash) from steam electric power plants to landfills (on- or off-site). The frequency and distance of transport depends on a plant's operation and configuration; specific factors include the volume of waste generated and the availability of either an on-site or off-site nonhazardous landfill and its distance from the plant. Table X–1 of this preamble shows the net change in annual electrical energy usage associated with the final rule compared to the baseline, as well as the net change in annual fuel consumption requirements associated with the final rule compared to the baseline.

**Table X-1. Estimated Incremental Change in Energy Requirements Associated with the Final Rule Compared to the Baseline**

| Non-Water Quality Environmental Impact | Energy Use Associated with Final Rule |
|---|---|
| Electrical energy usage (MWh) | 309,000 |
| Fuel (thousand gallons) | 116 |

The EPA estimates that energy use associated with discharges of unmanaged CRL could amount to as much as 280,000 MWh and 442 thousand gallons of fuel annually. See section VII.C.5 of this preamble for more information regarding the subcategory for discharges of unmanaged CRL.

*B. Air Pollution*

The final rule is expected to affect air pollution through three main mechanisms: (1) changes in auxiliary electricity use by steam electric power plants due to the need to operate wastewater treatment, ash handling, and other systems for compliance with regulatory requirements; (2) changes in transportation-related emissions due to the trucking of CCR waste to landfills; and (3) the change in the profile of electricity generation due to regulatory requirements. This section discusses air emission changes associated with the first two mechanisms and presents the corresponding estimated net changes in air emissions. See section XII.B.3 of this preamble for additional discussion of the third mechanism.

Steam electric power plants generate air emissions from operating transport vehicles, such as dump trucks, which release criteria air pollutants and GHGs. A decrease in energy use or vehicle operation would result in decreased air pollution.

The final rule is projected to result in changes in electrical energy compared to the baseline. To estimate the net air emissions associated with these changes, the EPA combined the energy usage estimates with air emission factors associated with electricity production to calculate air emissions associated with the incremental energy requirements. The EPA estimated $NO_X$, sulfur dioxide ($SO_2$), and $CO_2$ emissions using plant- or NERC-specific emission factors (tons/MWh) obtained from IPM for run year 2035.

To estimate net air emissions changes in the operation of transport vehicles, the EPA used the MOVES4.0 model to identify air emission factors (tons/mile) for the air pollutants of interest. The EPA estimated the annual number of miles that dump trucks moving ash or wastewater treatment solids to on- or off-site landfills would travel for the final rule. The EPA used these estimates to calculate the net change in air emissions for the final rule. Table X–2 of this preamble presents the estimated net change in air emissions associated with auxiliary electricity and transportation for the final rule.



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**Table X-2. Estimated Net Change in Industry-Level Air Emissions Associated with Auxiliary Electricity and Transportation for the Final Rule Compared to the Baseline**

| $CO_2$ (million tons/year) | $CH_4$ (thousand tons/year) | $NO_X$ (thousand tons/year) | $SO_2$ (thousand tons/year) |
|---|---|---|---|
| 0.14 | 0.008 | 0.09 | 0.12 |

$CH_4$ = methane

The EPA estimates that air emissions associated with discharges of unmanaged CRL could amount to as much as 0.048 million tons of $CO_2$, 0.022 thousand tons of $NO_X$, and 0.014 thousand tons of $SO_2$ annually. See section VII.C.5 of this preamble for more information regarding the subcategory for discharges of unmanaged CRL.

The modeled output from IPM predicts that compliance costs attributable to the final rule will result in changes in electricity generation compared to the baseline. These changes in electricity generation are, in turn, predicted to affect the amount of $NO_X$, $SO_2$, and $CO_2$ emissions from steam electric power plants.[182] Table X–3 of this preamble shows a summary of the net change in annual air emissions associated with the final rule for all three mechanisms for the IPM run year 2035. As with costs, the IPM run from the final rule reflects the range of non-water quality environmental impacts associated with the final rule. To provide some perspective on the estimated changes, the EPA compared the estimated change in air emissions to the net amount of air emissions generated in a year by all electric power plants throughout the United States. For a detailed breakout of each of the three sources of air emission changes, see section 7 of the TDD.

**Table X-3. Estimated Net Change in Industry-Level Air Emissions Associated with Changes in Auxiliary Electricity, Transportation, and Electricity Generation for the Final Rule Compared to the Baseline in IPM Run Year 2035 and 2020 Emissions**

| Non-Water Quality Environmental Impact | Change in Emissions | 2020 Emissions by Electric Power Generating Industry |
|---|---|---|
| $CO_2$ (million tons/year) | -13 | 1,650 |
| $NO_X$ (thousand tons/year) | -8.7 | 1,020 |
| $SO_2$ (thousand tons/year) | -13 | 954 |

*C. Solid Waste Generation and Beneficial Use*

Steam electric power plants generate solid waste associated with sludge from wastewater treatment systems (*e.g.,* chemical precipitation). The EPA estimates the change in the amount of solids generated under the final rule compared to the baseline as 1.74 million tons per year. The EPA estimates that solid waste generation associated with the treatment of discharges of unmanaged CRL could amount to as much as 4.2 million tons per year.

The EPA also evaluated the potential impacts of diverting FA from current beneficial uses toward encapsulation of membrane filtration brine for disposal in a landfill. According to the latest American Coal Ash Association survey,[183] more than half of the FA generated by coal-fired power plants is being sold for beneficial uses rather than disposed of, and the majority of this beneficially used FA is replacing Portland cement in concrete. This also holds true for the specific facilities currently discharging FGD wastewater and expected to achieve zero discharge under the final rule, as seen by sales of FA in Schedule 8A of the 2021 EIA–923.[184] Summary statistics of the FA beneficial use percentage for these facilities is displayed in table X–4.

[182] The EPA also considered changes in particulate matter (see section XII.B.3 of this preamble). As explained in the BCA section 8.1: ''IPM outputs include estimated $CO_2$, $NO_X$, and $SO_2$ emissions to air from EGUs. The EPA also used IPM outputs to estimate EGU emissions of primary $PM_{2.5}$ based on emission factors described in U.S. EPA (2020c). Specifically, the EPA estimated primary $PM_{2.5}$ emissions by multiplying the generation predicted for each IPM plant type (ultrasupercritical coal without carbon capture and storage, combined cycle, combustion turbine, etc.) by a type-specific empirical emission factor derived from the 2016 National Emissions Inventory and other data sources. The emission factors reflect the fuel type (including coal rank), FGD controls, and state emission limits for each plant type, where applicable.''

[183] Available online at: *https://acaa-usa.org/wp-content/uploads/2022/12/2021-Production-and-Use-Survey-Results-FINAL.pdf.*

[184] Available online at: *https://www.eia.gov/electricity/data/eia923/.*



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**Table X-4. Percent of FA Sold for Beneficial Use at Facilities Discharging FGD Wastewater**

| Statistic | FA Percent Sold for Beneficial Use |
|---|---|
| Min | 0% |
| 10th | 0% |
| 25th | 5% |
| Median | 56% |
| Mean | 48% |
| 75th | 83% |
| 90th | 93% |
| Max | 100% |

The EPA also evaluated FA sales at facilities with CRL discharges that achieve zero discharge under the final rule in Schedule 8A of the 2021 EIA–923.[185] Summary statistics of the FA beneficial use percentage for these facilities are displayed in table X–5.

**Table X-5. Percent of FA Sold for Beneficial Use at Facilities Discharging CRL**

| Statistic | FA Percent Sold for Beneficial Use |
|---|---|
| Min | 0% |
| 10th | 0% |
| 25th | 0% |
| Median | 23% |
| Mean | 38% |
| 75th | 81% |
| 90th | 100% |
| Max | 100% |

In the CCR rule,[186] the EPA noted that FA replacing Portland cement in concrete would result in significant avoided environmental impacts to energy use, water use, GHG emissions, air emissions, and waterborne wastes.

For the final rule, the EPA is identifying zero-discharge systems as the technology basis for establishing BAT limitations to control pollutants discharged in FGD wastewater and CRL. More specifically, the technology basis for BAT is membrane filtration systems, SDEs, and thermal evaporation systems (see section VII.B of this preamble for more details). For the final rule, the EPA made several updates to its FA analysis, including the following: revising estimates of the amount of FA required for brine encapsulation, revising estimates of the amount of FA available at each plant for brine encapsulation, adding costs for steam electric power plants that would need to purchase additional FA for brine encapsulation, adding costs for disposal of the additional FA, and revising compliance costs by selecting the least costly zero-discharge technology for FGD and/or CRL. See section 5 of the TDD and the EPA's *2024 Steam Electric Supplemental Final Rule: Fly Ash Analysis* memorandum (DCN SE11692) for more details. The EPA found that 17 of the 26 steam electric power plants with FGD wastewater discharges produce enough FA for the EPA's estimated brine encapsulation if they do not sell any FA. Two plants with a FA deficit are expected to retire or undergo fuel conversion prior to December 31, 2034, and will not need to meet zero-discharge requirements under the final rule. The EPA expects that the other seven plants with a FA deficit will install SDEs (or another technology at a lower cost) that will not require the use of FA for encapsulation to meet the final rule requirements. In addition, plants may be able to manage the FA deficit through FGD scrubber purge management and using a different brine encapsulation recipe (*e.g.,* include additional lime).

The EPA also found 61 of the 90 steam electric power plants with CRL discharges produce enough FA for the EPA's estimated brine encapsulation, even after accounting for encapsulation for FGD wastewater treatment. Thirteen of the 29 plants with a FA deficit will retire or undergo fuel conversion prior to December 31, 2034, and will not need to meet zero discharge requirements under the final rule. The EPA expects that the other 16 plants with a FA deficit will either purchase FA (accounted for in the EPA's cost estimates), manage the deficit using approaches described above for FGD wastewater, or install SDEs (or another technology at a lower cost) which will

[185] Available online at: *https://www.eia.gov/electricity/data/eia923/.*

[186] Available online at: *https://www.regulations.gov.* Docket ID: EPA–HQ–RCRA–2009–0640.

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not require the use of FA for encapsulation to meet the final rule requirements. See additional discussion in section VII.B.1.a of this preamble.

*D. Changes in Water Use*

Steam electric power plants typically use water for handling solid waste, including ash, and for operating wet FGD scrubbers. The technology basis for FGD wastewater in the 2020 rule, chemical precipitation plus LRTR, was not expected to reduce or increase the volume of water used. Under this final rule, plants that install a membrane filtration or thermal evaporation system for FGD wastewater treatment are assumed to decrease their water use compared to the baseline by recycling all permeate back into the FGD system, which would avoid the costs of pumping or treating new makeup water. Therefore, the EPA estimated the reduction in water use resulting from membrane filtration or thermal evaporation treatment as equal to the estimated volume of the permeate stream from the membrane filtration system.

The BA transport technologies associated with the baseline and the final rule for BA transport water eliminate or reduce the volume of water used by wet sluicing BA operating systems. The 2020 rule established limitations based on plants operating a high recycle rate system, allowing up to a 10 percent purge of the total system volume. As part of this rule, the EPA is establishing zero-discharge requirements for BA handling. Thus, for the final rule, the EPA expects to see a decrease in water use for BA handling operations because plants that operate zero discharge BA handling systems are assumed to decrease their water use compared to baseline by recycling all transport water back to the BA handling system, which would avoid the costs of pumping or treating new makeup water. The EPA estimated the reduction in water use resulting from complete recycle as equal to the estimated volume of the percent purge (estimated to be 2 percent).

The EPA does not expect a change in water use associated with the treatment technology considered for the treatment of CRL or legacy wastewater as part of this final rule.

Overall, the EPA estimates that plants would decrease their water use by 5.52 million gallons per day (MGD) compared to the baseline under the final rule.

## XI. Environmental Assessment

*A. Introduction*

The EPA conducted an environmental assessment for this final rule. The Agency reviewed available literature on the documented environmental and human health effects of the pollutants discharged in steam electric power plant FGD wastewater, BA transport water, CRL, and legacy wastewater. The EPA conducted modeling to determine the impacts of pollutant discharges from the plants that are regulated by this final rule. For the reasons described in section VIII of this preamble, the baseline for these analyses appropriately consists of the environmental and human health results of achieving the 2020 rule requirements (the same baseline the EPA used to evaluate costs, benefits, and pollutant loadings). Under this assessment, the EPA compared the change in impacts associated with the final rule to those projected under the baseline.

The EA presents information from the EPA's review of the scientific literature and documented cases of impacts of pollutants discharged in steam electric power plant wastewater on human health and the environment, as well as a description of EPA's modeling methodology and results. The EA contains information on literature that the EPA has reviewed since the 2020 rule, updates to the environmental assessment analyses, and modeling results for the final rule. The 2015 EA (EPA–821–R–15–006) and 2020 EA (EPA 821–R–20–002) provide information from the EPA's earlier review of the scientific literature and of documented cases of the impacts on human health and the environment associated with the wider range of steam electric power plant wastewater discharges addressed in the 2015 rule, as well as a full description of the EPA's modeling methodology.

Current scientific literature indicates that untreated steam electric power plant wastewaters, such as FGD wastewater, BA transport water, CRL, and legacy wastewater, contain large amounts of a wide range of pollutants, some of which are toxic and bioaccumulative and cause detrimental environmental and human health impacts. For additional information, see section 2 of the EA. The EPA also considered environmental and human health effects associated with changes in air emissions, solid waste generation, and water withdrawals. sections X and XII of this preamble discuss these effects.

*B. Updates to the Environmental Assessment Methodology*

For this rule, the EPA used the steady-state, national-scale immediate receiving water (IRW) model to evaluate the direct and indirect discharges from steam electric power plants. This model was also used for the 2015 and 2020 ELG rules and 2015 CCR rule. The model focused on impacts within the immediate surface waters where discharges occurred (defined as the closest segments of approximately 0.25 miles to five miles long). The EPA also modeled receiving water concentrations downstream from steam electric power plant discharges using a downstream fate and transport model (*see* section XII). For this final rule, the Agency updated pollutant-specific benchmarks based on revised guidance and standards. The environmental assessment also incorporates changes to the industry profile outlined in section V of this preamble.

*C. Outputs From the Environmental Assessment*

Based on comparisons to the baseline, the EPA estimated environmental and ecological changes associated with the changes in pollutant loadings expected under the final rule. These environmental and ecological changes include changes in impacts to wildlife and humans. More specifically, the environmental assessment evaluated changes in: (1) surface water quality, (2) impacts to wildlife, (3) number of receiving waters with potential human health cancer risks, (4) number of receiving waters with potential to cause noncancer human health effects, and (5) metal and nutrient discharges to sensitive waters (*e.g.,* CWA section 303(d) impaired waters).[187] The EPA also evaluated other unqantified environmental changes (*e.g.,* ground water quality and attractive nuisances), as well as further impacts as described in section XII.

As described in the EA, the EPA focused its quantitative analyses on the changes in environmental and human health impacts associated with exposure to toxic, bioaccumulative pollutants via the surface water pathway. The EPA modeled changes levels of toxic, bioaccumulative pollutants in

[187] For the proposed rule, the EPA evaluated potential cumulative impacts (joint toxic action) based on interaction profiles (*Supplemental Environmental Assessment for the Proposed Revisions to the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* (EPA–821–R–23–004). DCN SE10328). EPA did not receive any comment on the analysis and provides a qualitative summary in the EA for the final rule based on the previous analysis.



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discharges of FGD wastewater, BA transport water, CRL, and legacy wastewater into rivers, streams, and lakes, including reservoirs. The EPA also addressed environmental impacts from nutrients in the EA, as well as in a separate analysis in section XII of this preamble.

The environmental assessment concentrates on impacts to aquatic life based on changes in surface water quality; impacts to aquatic life based on changes in sediment quality in surface waters; impacts to wildlife from consumption of contaminated aquatic organisms; and impacts to human health from consumption of contaminated fish and water. The EA discusses, with quantified results, the estimated environmental improvements within the immediate receiving waters due to the pollutant loading reductions associated with the final rule compared to the 2020 rule.

## XII. Benefits Analysis

This section summarizes the national environmental benefits due to changes in steam electric power plant discharges. The BCA report provides additional details on the benefits methodologies and analyses. The analysis methodology for quantified benefits is generally the same that EPA used for the 2015 and 2020 rule*s,* but with revised inputs and assumptions that reflect updated data and regulatory options. Consistent with the analysis of social costs, the EPA analyzed benefits of changes occurring in 2025 through 2049. The rule benefits are projected to begin accruing when each plant implements the control technologies needed to comply with any applicable BAT effluent limitations or pretreatment standards. As discussed in the BCA, for the purpose of the economic impact and benefit analysis, EPA generally estimates that plants will implement control technologies to meet the applicable rule limitations and standards as their permits are renewed, and no later than December 31, 2029. This schedule recognizes that control technology implementation is likely to be staggered over time across the universe of steam electric power plants. The period of analysis extends to 2049 to capture the estimated life of the compliance technology at any steam electric power plant (20 or more years), starting from the year of technology implementation, which can be as late as 2029. Benefits are annualized over 25 years.

### *A. Categories of Benefits Analyzed*

Table XII–1 of this preamble summarizes benefit categories associated with the final rule. Analyzed benefits fall into four broad categories: (1) human health benefits from surface water quality improvements, (2) ecological conditions and recreational use effects from surface water quality changes, (3) market and productivity benefits, and (4) air-related effects.[188] Within these broad categories, the EPA was able to assess the benefits of the final rule with varying degrees of completeness and rigor. Where possible, the EPA quantified the expected changes in effects and estimated monetary values. However, data limitations, modeling limitations, and gaps in the understanding of how society values certain environmental changes prevented the EPA from quantifying and/or monetizing some benefit categories.

The following section summarizes the EPA's analysis of the benefit categories the Agency was able to partially quantify and/or monetize to various degrees (identified in the columns of table XII–1 of this preamble). The EPA reviewed comments received in response to the proposed rule on the extent to which partially quantified benefits (*e.g.,* some health endpoints) or unquantified benefits (*e.g.,* cost savings to drinking water systems) could be more fully quantified and/or monetized. In the final rule analysis, the Agency revised its approach to quantify and monetize additional benefits, including those associated with avoided cardiovascular disease premature mortality from reduced lead exposure and those associated with avoided drinking water treatment costs. The final rule also affects additional benefit categories that the Agency was not able to quantify or monetize at all. The BCA further describes some of these important nonmonetized benefits. The EPA notes that all human health and environmental improvements discussed in the EA also represent benefits of the final rule (whether quantified or unquantified).

[188] Consistent with Office of Management and Budget Circular A–4 (2023), EPA appropriately considers additional benefits of this action (*e.g.,* air benefits). Circular A–4 (2023) states:

> Your analysis should look beyond the obvious benefits and costs of your regulation and consider any important additional benefits or costs, when feasible. . . . These sorts of effects sometimes are referred to by other names: for example, indirect or ancillary benefits and costs, co-benefits, or countervailing risks.



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**Table XII-1. Summary of Estimated Benefits Categories**

| Benefit Category | Quantified and Monetized | Quantified, but Not Monetized | Neither Quantified nor Monetized (Analyzed Qualitatively) |
|---|---|---|---|
| **Human Health Benefits from Surface Water Quality Improvements** | | | |
| Changes in incidence of bladder cancer from exposure to total trihalomethanes (TTHM) in drinking water | ✓ | | |
| Changes in incidence of cancer from arsenic exposure via consumption of self-caught fish | | ✓ | |
| Changes in incidence of cardiovascular disease from lead exposure via consumption of self-caught fish | ✓ | | |
| Changes in incidence of other cancer and noncancer adverse health effects (*e.g.*, reproductive, immunological, neurological, circulatory, or respiratory toxicity) due to exposure to arsenic, lead, cadmium, and other toxics from consumption of self-caught fish or drinking water | | ✓ | |
| Changes in IQ loss in children from lead exposure via consumption of self-caught fish, including changes in specialized education needs for children from lead exposure via consumption of self-caught fish | ✓ | | |
| Changes in IQ loss in infants from *in utero* mercury exposure via maternal consumption of self-caught fish | ✓ | | |
| Changes in health hazards from exposure to pollutants in waters used recreationally (*e.g.*, swimming) | | ✓ | |
| **Ecological Condition and Recreational Use Effects from Surface Water Quality Changes** | | | |
| Benefits from changes in surface water quality, including: aquatic and wildlife habitat; water-based recreation, including fishing, swimming, boating, and near-water activities; aesthetic benefits, such as enhancement of adjoining site amenities (*e.g.*, residing, working, traveling, and owning property near the water);[a] and nonuse value (existence, option, and bequest value from improved ecosystem health)[a] | ✓ | | |
| Benefits from protection of threatened and endangered species | | ✓ | |
| Changes in sediment contamination | | | ✓ |
| **Market and Productivity Benefits** | | | |
| Changes in water treatment costs for municipal drinking water | ✓ | | |
| Changes in water treatment costs for irrigation water and industrial process | | | ✓ |
| Changes in commercial fisheries yields | | | ✓ |
| Changes in tourism and participation in water-based recreation | | | ✓ |
| Changes in property values from water quality changes | | | ✓ |
| Changes in maintenance dredging of navigational waterways and reservoirs due to changes in sediment discharges | ✓ | | |
| **Air-Related Effects** | | | |
| Human health benefits from changes in morbidity and mortality from exposure to $NO_X$, $SO_2$, and $PM_{2.5}$ | ✓ | | |
| Avoided climate change impacts from GHG emissions | ✓ | | |

[a] Some, although not necessarily all, of these values are implicit in the total willingness to pay (WTP) for water quality improvements.



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*B. Quantification and Monetization of Benefits*

1. Human Health Effects From Surface Water Quality Changes

Changes in pollutant discharges from steam electric power plants affect human health in multiple ways. Exposure to pollutants in steam electric power plant discharges via consumption of fish from affected waters can cause a wide variety of adverse health effects, including cancer, kidney damage, nervous system damage, fatigue, irritability, liver damage, circulatory system damage, vomiting, diarrhea, and IQ loss. Exposure to drinking water containing brominated disinfection byproducts can cause adverse health effects such as bladder cancer and reproductive and fetal development issues. Because the final rule will reduce discharges of steam electric pollutants into waterbodies that directly receive or are downstream from these discharges, it may reduce the incidence of associated illnesses, even if by relatively small amounts.

Due to data limitations and uncertainties, the EPA can only monetize a subset of the health benefits associated with changes in pollutant discharges from steam electric power plants resulting from the final rule. The EPA estimated changes in the number of individuals experiencing adverse human health effects in the populations exposed to steam electric discharges and/or altered exposure levels and valued these changes using different monetization methods for different benefit endpoints.

The EPA estimated changes in health risks from the consumption of contaminated fish from waterbodies within 50 miles of households. The EPA used Census block group population data and region-specific average fishing rates to estimate the exposed population. The EPA used cohort-specific fish consumption rates and waterbody-specific fish tissue concentration estimates to calculate potential exposure to steam electric pollutants in recreational fishers' households. Cohorts were defined by age, sex, race/ethnicity, and fishing mode (recreational or subsistence). EPA used these data to quantify and monetize changes in three categories of human health effects, which are further detailed in the BCA Report: (1) reduction in IQ loss from lead exposure via fish consumption in children aged zero to seven, (2) reduction in cardiovascular disease premature mortality from lead exposure via fish consumption and (3) reduction in *in utero* mercury exposure via maternal fish consumption and associated IQ loss. The EPA also analyzed the reduction in the incidence of skin cancer from arsenic exposure via fish consumption but found negligible changes and therefore did not monetize the associated benefits.

EPA estimated the annualized human health benefits of surface water quality changes of the final rule and the resultant reduction in pollutant exposure from consuming self-caught fish to range between $2.18 million and $2.45 million using a two percent discount rate. Most of these monetized benefits are associated with the changes in mercury exposure. section 5 of the BCA provides additional detail on the methodology.

The EPA also estimated changes in bladder cancer incidence from the use and consumption of drinking water with lower levels of total trihalomethanes (TTHMs) resulting from reductions in bromide discharges under the final rule. The EPA estimated changes in cancer risks within populations served by drinking water treatment plants with intakes on surface waters affected by bromide discharges from steam electric power plants. The EPA used the service area of each public water system to estimate and characterize the exposed population. The EPA modeled changes in waterbody-specific bromide concentrations and changes in facility-specific TTHM concentrations at drinking water treatment facilities to calculate potential reductions in TTHM exposure and associated health benefits. To value changes in the economic burden associated with cancer morbidity, the EPA used base WTP estimates from Bosworth, Cameron, and DeShazo (2009) for colon/bladder cancer. To value changes in excess mortality from bladder cancer, the EPA used the estimated value of a statistical life (VSL) for each year in the period of analysis (from $13.54 million per death in 2025 to $16.36 million per death in 2049).

The final rule is estimated to result in a total of 98 avoided cancer cases and 28 avoided premature excess deaths by reducing TTHM exposure during the period 2025–2049. The associated annualized benefits are $13.4 million using a two percent discount rate.

The formation of TTHM in a particular water treatment system is a function of several site-specific factors, including chlorine, bromine, and organic carbon concentrations; and temperature and pH of the water; and the system residence time. The EPA did not collect site-specific information on these factors at each potentially affected drinking water treatment facility. Instead, the EPA's analysis only addresses the estimated site-specific changes in bromides. The EPA used the national relationship between changes in TTHM exposure and changes in incidence of bladder cancer modeled by Regli et al. (2015) [189] and Weisman et al. (2022).[190] Thus, while the national changes in TTHM exposure and bladder cancer incidence are the EPA's best estimate given estimated changes in bromide, the EPA cautions that estimates for any specific drinking water treatment facility could be over- or underestimated. Additional details on this analysis are provided in section 4 of the BCA.

2. Ecological Condition and Recreational Use Effects from Changes in Surface Water Quality Improvements

The EPA evaluated whether the final rule would alter aquatic habitats and human welfare by reducing concentrations of harmful pollutants such as arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, nitrogen, phosphorus, and suspended sediment relative to baseline. These changes may affect the usability of some recreational waters relative to baseline, thereby affecting recreational users. Changes in pollutant loadings can also change the attractiveness of recreational waters by making recreational trips more or less enjoyable. The final rule may also change nonuse values stemming from bequest, altruism, and existence motivations. Individuals may value water quality maintenance, ecosystem protection, and healthy species populations independent of any use of those attributes.

The EPA uses a water quality index (WQI) to translate water quality measurements, gathered for multiple parameters that indicate various aspects of water quality, into a single numerical indicator. The indicator reflects achievement of quality consistent with the suitability for certain uses. The WQI includes seven parameters: dissolved oxygen, biochemical oxygen demand, fecal coliform, total nitrogen, total phosphorus, TSS, and one aggregate

[189] Regli, S., Chen, J., Messner, M., Elovitz, M.S., Letkiewicz, F.J., Pegram, R.A., . . . Wright, J.M. (2015). *Estimating Potential Increased Bladder Cancer Risk Due to Increased Bromide Concentrations in Sources of Disinfected Drinking Waters.* Environmental Science & Technology, 49(22), 13094–13102. Available online at: *https://doi.org/10.1021/acs.est.5b03547.*

[190] Weisman, R., Heinrich, A., Letkiewicz, F., Messner, M., Studer, K., Wang, L., . . . Regli, S. (2022). *Estimating National Exposures and Potential Bladder Cancer Cases Associated with Chlorination DBPs in U.S. Drinking Water.* Environmental Health Perspectives, 130:8, 087002–1–087002–10. Available online at: *https://ehp.niehs.nih.gov/doi/full/10.1289/EHP9985.*



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subindex for toxics. The EPA modeled changes in four of these parameters and held the remaining parameters (dissolved oxygen, biochemical oxygen demand, and fecal coliform) constant for the purposes of this analysis.

The EPA estimated the change in monetized benefit values using an updated version of the meta-regressions of surface water valuation studies used in the benefit analyses of the 2015 and 2020 rules. The meta-regressions quantify average household WTP for incremental improvements in surface water quality. section 6 of the BCA provides additional detail on the valuation methodology.

An estimated 58.9 million households reside in Census block groups that are within 100 miles of reaches that are affected by the final rule.[191] The central tendency estimate of the total WTP for water quality changes associated with reductions in metal pollutants (arsenic, cadmium, chromium, copper, lead, mercury, zinc, and nickel), nonmetal pollutants (selenium), nutrient pollutants (phosphorus and nitrogen under the final rule is $1.24 million using a two percent discount rate. The average WTP per household is $0.02 per year.

3. Changes in Air-Quality-Related Effects

The EPA expects the final rule to affect air pollution through three main mechanisms: (1) changes in auxiliary electricity use by steam electric facilities due to the need to operate wastewater treatment, ash handling, and other systems for compliance with the final rule; (2) changes in transportation-related air emissions due to changes in the trucking of CCR waste to landfills; and (3) changes in the electricity generation profile due to increases in wastewater treatment costs compared to baseline and the resulting changes in EGU relative operating costs.

Changes in the electricity generation profile can increase or decrease air pollutant emissions because emission factors vary for different types of EGUs. For this analysis, the changes in air emissions are based on the change in dispatch of EGUs as projected by IPM after overlaying the costs of complying with the final rule onto EGUs' production costs. As discussed in section VIII of this preamble, the IPM analysis accounts for the effects of other regulations on the electric power sector, as well as provisions of the IRA.

The EPA evaluated potential effects resulting from net changes in air emissions of five pollutants: $CO_2$, $CH_4$, $NO_X$, $SO_2$, and primary $PM_{2.5}$. $CO_2$ and $CH_4$ are key GHGs linked to a wide range of climate-related effects. $CO_2$ is also the main GHG emitted from coal power plants. $NO_X$ and $SO_2$ are precursors to $PM_{2.5}$, which are also emitted directly, and $NO_X$ is an ozone precursor. These air pollutants cause a variety of adverse health effects including premature mortality, nonfatal heart attacks, hospital admissions, emergency department visits, upper and lower respiratory symptoms, acute bronchitis, aggravated asthma, lost work and school days, and acute respiratory symptoms.

Table XII–2 of this preamble shows the changes in emissions of $CO_2$, $CH_4$, $NO_X$, $SO_2$, and primary $PM_{2.5}$ under the final rule relative to the baseline for selected IPM run years. The final rule will result in a net reduction in air emissions of four pollutants, and a small increase in $CH_4$ emissions due to the increased trucking of CCR waste to landfills. This effect is driven mostly by the estimated changes in the profile of electricity generation, as emission reductions due to shifts in modeled EGU dispatch and energy sources offset relatively small increases in air emissions from increased electricity use and trucking by steam electric power plants.

**Table XII-2. Estimated Changes in Air Pollutant Emissions Under the Final Rule Compared to Baseline**

| Year | $CO_2$ (Million Short Tons/Year) | $CH_4$ (Thousand Short Tons/Year) | $NO_X$ (Thousand Short Tons/Year) | $SO_2$ (Thousand Short Tons/Year) | Primary $PM_{2.5}$ (Thousand Short Tons/Year) |
|---|---|---|---|---|---|
| 2028 | -16.4 | 0.0042 | -8.9 | -10.7 | -0.63 |
| 2030 | -10.8 | 0.0083 | -7.3 | -2.4 | -0.38 |
| 2035 | -12.6 | 0.0083 | -8.7 | -12.5 | -0.25 |
| 2040 | -1.9 | 0.0083 | -3.1 | -2.2 | -0.16 |
| 2045 | -1.3 | 0.0083 | -0.6 | -0.9 | -0.09 |
| 2050 | -0.6 | 0.0079 | -0.4 | -0.7 | -0.12 |

The EPA estimated the monetized value of human health benefits among populations exposed to changes in $PM_{2.5}$ and ozone. The final rule is expected to alter the emissions of primary $PM_{2.5}$, $SO_2$ and $NO_X$, which will in turn affect the level of $PM_{2.5}$ and ozone in the atmosphere. Using photochemical modeling, the EPA predicted the change in the annual average $PM_{2.5}$ and summer season ozone across the United States. The EPA next quantified the human health impacts and economic value of these changes in air quality using the environmental Benefits Mapping and Analysis Program—Community Edition.

To estimate the climate benefits associated with changes in $CO_2$ and $CH_4$ emissions, the EPA used social cost of greenhouse gas (SC–GHG) estimates specifically, estimates of the social cost of carbon (SC–$CO_2$) and social cost of methane (SC–$CH_4$). The SC–GHG is an estimate of the monetary value of the net harm to society associated with emitting a metric ton of the GHG in question into the atmosphere in a given

[191] A reach is a section of a stream or river along which similar hydrologic conditions exist, such as discharge, depth, area, and slope.



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year, or the benefit of avoiding those emissions.[192]

To estimate the net climate benefits of $CO_2$ emission reductions expected from the final rule and disbenefits of increases in $CH_4$ emissions, the EPA used the SC–GHG estimates presented in the 2023 final rule Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review (U.S. EPA, 2023). These estimates reflect recent advances in the scientific literature on climate change and its economic impacts and incorporate recommendations made by the National Academies (National Academies, 2017). See section 8 of the BCA for more discussion of the SC–GHG values.

Table XII–3 of this preamble shows the annualized climate change, $PM_{2.5}$, and ozone-related human health benefits for the final rule. Climate change benefits are presented for the three near-term Ramsey discount rates used in developing the SC–GHG values, whereas the $PM_{2.5}$ and ozone-related human health benefits are based on long-term ozone exposure mortality risk estimates and with a two percent discount rate. See section 8 of the BCA for benefits based on pooled short-term ozone exposure mortality risk estimates.

**Table XII-3. Annualized Benefits of Estimated Changes in Air Pollutant Emissions Under the Final Rule Compared to the Baseline (Millions of 2023$)**

| SC-GHG Near-term Ramsey Discount Rate | Climate Change Benefits | PM2.5 and Ozone Related Human Health Benefits at 2% Discount Rate[a] | Total |
|---|---|---|---|
| 2.5% | $990 | $1,600 | $2,600 |
| 2.0% | $1,600 | $1,600 | $3,200 |
| 1.5% | $2,600 | $1,600 | $4,200 |

[a] Reflects long-term ozone exposure mortality risk estimate.

The estimates of monetized benefits shown here do not include several important benefit categories, such as direct exposure to $SO_2$, $NO_X$, and HAPs, including mercury and hydrogen chloride. Although the EPA does not have sufficient information or modeling available to provide monetized estimates of changes in exposure to these pollutants for the final rule, the EPA includes a discussion of these unquantified benefits in the BCA. For more information on the benefits analysis, see section 8 of the BCA.

4. Other Quantified and/or Monetized Benefits

a. Changes in Drinking Water Treatment Costs

The final rule will decrease discharges of pollutants that affect the costs of treating drinking water. TSS affects turbidity of source water, which drinking water systems treat by adding chemical coagulants to bond to the sediment particles. Drinking water systems thus accrue incremental costs related to purchases of coagulants as well as costs from disposal of coagulant sediment sludge. In addition, drinking water systems address taste and odor issues linked to excess nutrients (such as nitrogen) and associated eutrophication in source water. The EPA identified drinking water systems whose source waters are likely to see reductions in TSS and total nitrogen under the final rule, then estimated changes in source water concentrations of the pollutants for those systems. The EPA then estimated treatment cost savings associated with reductions in TSS and total nitrogen using a treatment cost elasticity approach (see Price and Heberling (2018) for a review of the literature on drinking water treatment cost elasticities). The EPA estimated cost changes relating to treatment O&M costs alone, assuming no net savings from any capital improvements drinking water systems already made. The EPA did not quantify avoided drinking water treatment costs associated with reductions in pollutants such as phosphorus, halogens, and metals due to uncertainties in the elasticity between source water concentrations of these parameters and drinking water treatment costs, lack of information on baseline concentrations of these pollutants at source water intakes, and the possibility of double-counting treatment cost savings for particular pollutants. The EPA expects that the final rule will provide relatively small annualized benefits from reductions in nitrogen and total suspended solids in the form of drinking water treatment cost savings of $460,000 to $552,000 per year, calculated using a 2 percent discount rate.

b. Changes in Dredging Costs

The final rule affects discharge loadings of various categories of pollutants, including TSS. As a result, the final rule is expected to change the rate of sediment deposition in affected waterbodies, including navigable waterways and reservoirs that require dredging for maintenance. The EPA estimated very small benefits from changes in sedimentation and associated maintenance dredging costs in reaches and reservoirs affected by steam electric power plant discharges. section 9 of the BCA provides additional detail on the methodology.

c. Benefits to Threatened and Endangered Species

To assess the potential for the final rule to benefit threatened and endangered species (both aquatic and terrestrial) relative to the 2020 ELG baseline, the EPA analyzed the overlap between waters expected to see reductions in wildlife water quality criteria exceedance status under the final rule and the known critical habitat

[192] In principle, the SC–GHG includes the value of all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk and natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services. The SC–GHG therefore, reflects the societal value of reducing emissions of by one metric ton. The EPA and other Federal agencies began regularly incorporating estimates of SC–$CO_2$ in their benefit-cost analyses conducted under Executive Order 12866 since 2008, following a Ninth Circuit Court of Appeals remand of a rule for failing to monetize the benefits of reducing $CO_2$ emissions in a rulemaking process.

locations of high-vulnerability threatened and endangered species. The EPA examined the life history traits of potentially affected threatened and endangered species and categorized the species by potential for population impacts due to surface water quality changes. Section 7 of the BCA provides additional detail on the methodology. The EPA's analysis showed that, of the species categorized as having higher vulnerability to water pollution, 30 have known critical habitats overlap with surface waters affected by steam electric power plant discharges. Improvements under the final rule between 2025 and 2029 are estimated to potentially benefit 10 of these species, whereas improvements projected after 2030 are estimated to benefit 12 species. Principal sources of uncertainty include the specifics of how changes under the final rule will impact threatened and endangered species, exact spatial distribution of the species, and additional species of concern not considered.

*C. Total Monetized Benefits*

Using the analysis approach described above, the EPA estimated annualized benefits of the final rule for all monetized categories. The final rule has monetized benefits estimated at $3,217 million using a two percent discount rate, as shown in table XII–4.

**Table XII-4. Summary of Total Estimated Annualized Monetized Benefits at Two Percent [Millions of 2023$]**

| Benefit Category | Annualized Benefits (Million 2023$, 2 Percent Discount) |
|---|---|
| **Human Health Effects from Water Quality Changes** | |
| Changes in IQ losses in children from exposure to lead[a] | <$0.01 |
| Changes in cardiovascular disease premature mortality from exposure to lead | $0.16 – $0.43 |
| Changes in IQ losses in children from exposure to mercury | $1.98 |
| Reduced cancer risk from disinfection byproducts in drinking water | $13.37 |
| **Ecological Conditions and Recreational Use Changes** | |
| Use and nonuse values for water quality improvements | $1.24 |
| **Market and Productivity[a]** | |
| Changes in drinking water treatment costs | $0.46 – $0.55 |
| Changes in dredging costs[a] | <$0.01 |
| **Air-Related Effects** | |
| Changes in GHG air emissions[b,c] | $1,600 |
| Changes in human health effects from Changes in $NO_X$ and $SO_2$ emissions[b] | $1,600 |
| **Total** | **$3,217** |

[a] An annualized benefit of "<$0.01" indicates that the monetary value is greater than $0 but less than $0.01 million.

[b] Values for air-quality related effects are rounded to two significant figures.

[c] Changes in $CO_2$ and $CH_4$ emissions monetized using SC-GHG estimates under the 2% near-term Ramsey discount rate. See section XII.B.3 and section 8 in the BCA for benefits monetized using SC-GHG estimates based on 1.5% and 2.5% near-term Ramsey discount rates.

*D. Additional Benefits*

The monetary value of the final rule's effects on social welfare does not account for all effects of the rule because, as described above, the EPA is currently unable to quantify and/or monetize some categories. The EPA anticipates that the final rule will also generate important unquantified benefits, including but not limited to:

- health benefits to over 30 million people who, due to reductions in PWS-level arsenic, lead, and thallium concentrations, will experience reductions in unmonetized cancer and non-cancer effects from exposure to toxic pollutants from consumption of fish or drinking water;
- unquantified and unmonetized averted IQ losses and educational effects from childhood lead exposure and *in-utero* mercury exposure from fish consumption by households that do not engage in recreational or subsistence fishing;
- improved habitat conditions for plants, invertebrates, fish, amphibians, and the wildlife that prey on aquatic organisms;
- enhanced ecosystem productivity and health, including reduced toxic discharges into habitats of over 100 high-vulnerability threatened and endangered species;



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- additional changes to water treatment costs for drinking water, irrigation, and agricultural uses;
- changes in fisheries yield and harvest quality from aquatic habitat changes;
- changes in health hazards from recreational exposures; and
- groundwater quality impacts.

While some health benefits and WTP for water quality improvements have been partially quantified and/or monetized, those estimates may not fully capture all important water quality-related benefits. Although the following quantifications cannot necessarily be combined with other monetized effects, another way to characterize the benefits is that the final rule is expected to result in a 53 percent reduction in chronic exceedances and a 33 percent reduction in acute exceedances of the national recommended water quality criteria. It is also expected to result in a reduction of up to a 63 percent in the number of immediate receiving water reaches with ambient concentrations exceeding human health criteria for at least one pollutant.

The BCA discusses changes in these potentially important effects qualitatively, indicating their potential magnitude where possible.

## XIII. Environmental Justice Impacts

Consistent with the EPA's commitment to advancing environmental justice (EJ) in the Agency's actions, the Agency has analyzed the impacts of this action on communities with EJ concerns and sought input and feedback from stakeholders representing these communities. The EPA has prepared this analysis to implement the recommendations of the Agency's EJ Technical Guidance.[193] For ELG rulemakings, an analysis of EJ impacts is typically conducted as part of the BCA alongside other non-statutorily required analyses such as monetized benefits. However, for this action, the analysis was placed in a standalone EJA document to provide the public with a more detailed discussion of the potential EJ impacts of this action and the initial outreach to communities with potential EJ impacts. The analysis does not form a basis or rationale for any of the actions the EPA is taking in this rulemaking.

Overall, EPA's EJ analysis showed the final rule will reduce differential baseline exposures to pollutants in wastewater and resulting human impacts for population groups of concern when considering potential EJ implications of this regulatory action. E.O. 12898 identifies a number of population groups of concern including minority populations, low-income populations, and Indigenous peoples in the United States and its territories and possessions. In this particular analysis, improvements to water quality, wildlife, and human health resulting from reductions in pollutants in surface water will be distributed more among low-income populations and some people of color under some or all of the regulatory options for this final rule.

Reductions in TTHM concentrations in drinking water and resulting reductions in bladder cancer cases and excess bladder cancer deaths will also be distributed more among communities with EJ concerns under the final rule. Remaining exposures, impacts, and benefits analyzed are small enough that EPA could not conclude whether changes in baseline disproportionate impacts would occur, such as reductions in avoided IQ point losses among children exposed to lead from fish consumption which were estimated to be a total of one avoided IQ point loss across approximately 1.5 million children.

Although the changes in GHGs attributable to the final rule are small compared to worldwide emissions, findings from peer-reviewed evaluations demonstrate that actions that reduce GHG emissions are also likely to reduce climate-related impacts on communities with EJ concerns.

At the national level, upper bound average compliance costs per residential households under the final rule are $3.14 per year. Costs of the final rule in terms of electricity price increases among residential households may impact low-income households and households of color more relative to all households as low-income households and households of color tend to spend a greater proportion of their income on energy expenditures. Despite this, the potential price increases under the upper bound cost scenario represent between less than 0.1 percent and 0.2 percent of energy expenditures for all income, race groups, and income quintiles, and therefore the EPA does not expect costs to have a substantial impact on low-income households and households of color. The methodology and findings of the EJA are described in further detail below.

### *A. Literature Review*

The EPA conducted a literature review to identify academic research and articles on EJ concerns related to coal-fired power plants. The EPA identified eight papers that focused on coal-fired power plants in the United States that were directly relevant to this final rule. The findings of these papers suggest that coal-fired power plants tend to be in poor communities, Indigenous communities, and communities of color. Toomey (2013) reported that 78 percent of African Americans in the United States live within a 30-mile radius of a coal-fired power plant.[194] Impacts discussed in the reports included adverse health impacts resulting from air pollutants (*e.g.,* $SO_2$, $NO_X$, $PM_{2.5}$) for those living in proximity to coal-fired power plants, climate justice issues resulting from GHG emissions, and risk of impoundment failures for populations living in proximity to coal waste surface impoundments where coal is mined.[195] [196] [197] All these impacts were found in one or more papers to differentially impact poor communities, Indigenous communities, and communities of color. For further discussion of the literature review, see section 2 of the EJA.

### *B. Proximity Analysis*

The EPA performed proximity analyses to identify and characterize the communities that are expected to be impacted by discharges from steam electric plants via relevant exposure pathways. First, the EPA used geographic information system (GIS) software to map out 1- and 3-mile buffers around each facility. A buffer is a zone that extends a specified distance in every direction from a point on a map. The EPA then assessed potential air impacts within those zones. The 1- and 3-mile distances were chosen to be consistent with the buffer distances

[193] U.S. EPA (Environmental Protection Agency). 2016. *Technical Guidance for Assessing Environmental Justice in Regulatory Analysis.* June. Available online at: *https://www.epa.gov/environmentaljustice/technical-guidance-assessing-environmental-justice-regulatory-analysis.*

[194] Toomey, D. 2013. *Coal Pollution and the Fight for Environmental Justice.* Yale Environment 360. June 19. Available online at: *https://www.e360.yale.edu/features/naacp_jacqueline_patterson_coal_pollution_and_fight_for_environmental_justice.*

[195] Liévanos, R.S., Greenberg, P., Wishart, R. 2018. *In the Shadow of Production: Coal Waste Accumulation and Environmental Inequality Formation in Eastern Kentucky.* Social Science Research, Vol. 71: pp. 37–55.

[196] Israel, B. 2012. *Coal Plants Smother Communities of Color. Scientific American. Available online at: https://www.scientificamerican.com/article/coal-plants-smother-communities-of-color/#:~:text=People%20living%20near%20coal%20plants,percent%20are%20people%20of%20color.*

[197] NAACP (National Association for the Advancement of Colored People). 2012. *Coal Blooded: Putting Profits Before People.* Available online at: *https://www.naacp.org/resources/coal-blooded-putting-profits-people.*



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used by the Office of Air and Radiation when performing screening analyses for communities surrounding industrial sources that are expected to be exposed to air emissions (U.S. EPA, 2021a).[198] These are the distances at which air pollution concentrations will be highest before the plume disperses, and an analysis of air impacts with these zones may capture other localized impacts such as air emissions from truck traffic due to changes in activities at steam electric power plants.

Second, the EPA assessed potential impacts in downstream surface waterbodies using 1-, 3-, 50-, and 100-mile buffer distances around each waterbody segment downstream of the initial common identifiers (COMIDs) identified for each effluent discharge. These buffers distances were used to capture impacts to local populations as well as impacts to those traveling to fish or recreate in downstream waterbodies (Sohngen et al, 2015; Sea Grant—Illinois-Indiana, 2018; Viscusi et al., 2008).[199] [200]

Finally, the EPA assessed potential drinking water impacts using information about the service area of PWSs with surface intakes downstream from steam electric power plants.

Overall, the EPA found that 90,000 people live within 1 mile of at least one of the 112 steam electric power plants expected to be affected by the final rule and modeled for the benefits analysis, and about 790,000 people live within 3 miles. When comparing the demographic characteristics of these populations to national demographic characteristics, small exceedances of the national average are observed. Of the population living within 3 miles of a steam electric power plant, the percentage of people identified as low-income is 0.1 percent greater than the national average, and the percent of the population identified as American Indian/Alaska Native and Other living within one and three miles of a steam electric power plant is one percent greater than the national average. The results show relatively greater proportions of people who identify as Asian (non-Hispanic), people who identify as American Indian or Alaska Native (non-Hispanic), and people who identify as Hispanic or Latino.

*C. Community Outreach*

During the public comment period, the EPA received a comment requesting that the Agency conduct additional outreach with the nine communities identified for outreach during the 2023 proposal. Commenters urged the EPA to not extend the written public comment period and to move forward expeditiously to finalize the proposed rule. Given the time required to plan and conduct the community outreach for the proposed rule (meetings with five of the nine communities were held between May and September 2022, with planning starting in February 2022), the EPA determined that it could not hold additional outreach meetings with all nine communities and also finalize the proposed rule expeditiously, as requested by the commenters. Therefore, the EPA did not hold additional outreach meetings for the final rule. The EPA presents the feedback received from the community outreach meetings conducted for the proposed rule in section 7.5 of the 2023 EJA,[201] which the EPA took into consideration for the final rule.

For the proposed rule, the EPA conducted initial outreach in all nine communities to local environmental and community development organizations, local government agencies, and individual community members involved in community organizing. Between May and September of 2022, EPA was able to meet with community members in five of the identified communities either virtually or in a hybrid format with some in-person participation. The EPA was not able to hold a virtual or hybrid meeting with the remaining four communities. For detailed information of the EPA's community selection methodology, the communities selected, and the structure of the community meetings, see section 7.4 of the 2023 EJA.[202]

The EPA received a broad range of input from individuals in these communities on regulatory preferences, environmental concerns, human health and safety concerns, economic impacts, cultural/spiritual impacts, and ongoing communication/public outreach. Community members also expressed interest in other EPA actions. Two broad themes were conveyed consistently across communities. First, community members identified several perceived harmful impacts from steam electric power plants and conveyed their desire for more stringent regulations to reduce these harmful impacts. Second, community members expressed that more transparency and communication is needed to overcome their decreasing trust in the regulated steam electric power plants and state regulatory agencies and their feelings of skepticism that their communities will be protected from these harmful impacts. In addition to these broad themes, commenters also raised concerns unique to each community. For example, members of the Navajo Nation discussed with the EPA the spiritual and cultural impacts to the community from pollution related to steam electric power plants. In Jacksonville, Florida, community members raised concerns about tidal flows that carry pollution upstream and about storm surges that occur during extreme weather events, causing additional challenges in their community. More detailed summaries of these meetings are presented in section X of the EJA.

The EPA considered all feedback received in these outreach meetings, including feedback on the stringency of potential new regulations and negative impacts experienced as a result of steam electric discharges. The final rule will result in more stringent limitations that will further reduce negative impacts associated with steam electric discharges. The EPA also considered feedback expressing the desire for increased transparency and communication. As discussed in section XIV.C.6, the EPA requiring posting of required reports to a publicly available website to improve transparency. In addition, the EPA recently added a new feature called ECHO Notify to the Enforcement and Compliance History Online (ECHO) website. ECHO Notify provides weekly email notifications of changes to enforcement and compliance data in ECHO. Notifications are tailored to the geographic locations, facility IDs, and notification options that users select. The EPA encourages interested community members to sign up for these alerts. Further information is available at *https://www.echo.epa.gov/tools/echo-notify*. The EPA also encourages individual facilities to work with local communities to foster trust and communication, for example, through text alert systems.

[198] U.S. EPA. 2021a. Regulatory Impact Analysis for Phasing Down Production and Consumption of Hydrofluorocarbons (HFCs) (September). EPA–HQ–OAR–2021–0044–0046.

[199] For this analysis, a downstream waterbody is defined as a segment of water 300 kilometers (~187 miles) downstream of a point of discharge from a steam electric power plant.

[200] Sohngen, B., Zhang, W., Bruskotter, J., & Sheldon, B. (2015). Results from a 2014 survey of Lake Erie anglers. Columbus, OH: The Ohio State University, Department of Agricultural, Environmental and Development Economics and School of Environment & Natural Resources; Sea Grant—Illinois-Indiana (2018). Lake Michigan anglers boost local Illinois and Indiana economies; Viscusi, W.K., Huber, J., & Bell, J. (2008). The economic value of water quality. Environmental and resource economics, 41(2), 169–187.

[201] U.S. Environmental Protection Agency (2023b). *Environmental Justice Analysis for Proposed Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category*.

[202] *Ibid.*



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*D. Distribution of Risks*

The EPA evaluated the distribution of pollutant loadings, estimated human health, and estimated environmental impacts resulting from polluted air, surface water, and drinking water. The EPA examined these distributions under both baseline and the regulatory options to identify where current conditions and future improvements may have a differential impact on communities with EJ concerns. The following sections discuss the EPA's methodology and findings.

1. Air

The EPA evaluated air quality impacts in terms of changes in warm season maximum daily average 8-hour (MDA8) ozone and average annual $PM_{2.5}$ concentrations, as described in the BCA. The EPA used the results of the analysis to further evaluate the distribution of air—quality impacts in the EJA to determine whether communities with EJ concerns experience disproportionately high exposures to MDA8 ozone and average annual $PM_{2.5}$ under the baseline and Option B.

The results of the EPA's distributional analysis of air quality impacts indicates that, under the baseline, average annual $PM_{2.5}$ and MDA8 ozone exposures are higher among certain communities with EJ concerns. The EPA found higher exposures for some populations, such as American Indian and Alaska Native (non-Hispanic), Asian (non-Hispanic), and Hispanic populations, relative to their relevant comparison groups. While the regulatory analysis estimating changes in average annual $PM_{2.5}$ and MDA8 ozone exposures shows increases and decreases in pollutant emissions across regions of the United States under the final rule, these changes overall are small and do not change the distribution of air-quality impacts observed under the baseline. Therefore, the EPA concludes that the air-quality changes resulting from the final rule are not expected to mitigate or exacerbate distributional disparities present under the baseline. See section 4.2 of the EJA for more information.

2. Surface Water

Using results from the EA and BCA, the EPA evaluated the distribution of pollutant loadings and the environmental and human health effects of wastewater discharges from steam electric power plants into surface waters into immediate receiving waters. The following sections provide an overview of the EPA's methodology and the results of the EPA's distributional analysis.

a. Immediate Receiving Waters

Using results from the EA, the EPA evaluated the distribution of pollutant loadings and the environmental and human health effects of wastewater discharges from steam electric power plants into immediate receiving waters across communities with EJ concerns. To evaluate the distribution of water quality impacts, the EPA used the IRW model to evaluate water quality impacts by calculating annual average total and dissolved pollutant concentrations in the water column and sediment of immediate receiving waters. It then compares these concentrations to specific water quality criteria values—National Recommended Water Quality Criteria (NRWQC) and Maximum Contaminant Levels (MCLs)—to assess potential impacts to wildlife and human health. To evaluate potential impacts to wildlife, the EPA used the IRW model to estimate bioaccumulation of pollutants in fish tissue of trophic level 3 (T3) and trophic level 4 (T4) fish using the annual average pollutant concentrations in the immediate receiving water. Those results were then compared to benchmark values—threshold effect concentration (TEC) and no effect hazard concentration (NEHC)—to evaluate potential impacts on exposed sediment biota and piscivorous wildlife that consume T3 and T4 fish, respectively. The EPA also used estimated fish tissue concentrations to assess human health impacts—non-cancer and cancer risks—to human populations from consuming fish that are caught in contaminated receiving waters. For a more detailed discussion of the IRW Model see the EA. Information on the socioeconomic characteristics of affected communities was gather from the 2017–2021 ACS dataset and was included with the results from the model to evaluate the distribution of impacts (relative to the baseline) under the final rule.

b. Water Quality, Wildlife, and Human Health Impacts

Based on the results of the distributional analyses of water quality, wildlife, and human health impacts, the EPA determined that under the baseline there were distributional disparities among communities with EJ concerns. Disparities were most often observed among populations such as African American (non-Hispanic) or American Indian or Alaska Native (non-Hispanic) populations when comparing the percent of the population affected in communities with immediate receiving waters benchmark exceedances to the national average and to communities with immediate receiving waters without benchmark exceedances. This, along with distributional disparities observed under the baseline for other populations, indicates the presence of potential EJ concerns under the baseline across the three analyses. Analyzing the impacts of final rule across the analyses, the EPA found that the final rule reduced the amount of immediate receiving waters with benchmark exceedances and the population affected by these exceedances. However, in each of the analyses the EPA found that while the final rule mitigated distributional disparities identified under the baseline for communities with EJ concerns, remaining immediate receiving waters with exceedances under the final rule were more concentrated in other communities with EJ concerns. EPA found particular concentration for American Indian or Alaska Native populations relative to the baseline. See section 4.2 of the EJA for more information.

c. Downstream Waters

Using the results from the downstream analysis performed in the BCA, the EPA further evaluated the downstream surface water impacts in the EJA to determine whether communities with EJ concerns experience a differential share of noncancer health effects from exposure mercury through consuming fish in contaminated downstream surface waters.

The results of the EPA's analysis showed potential EJ concerns in the baseline in terms of differential and adverse impacts in communities with EJ concerns. Differential and adverse impacts were concentrated among infants of color (*e.g.,* Hispanic, Asian [non-Hispanic], and Other [non-Hispanic]) and infants below the poverty level of mothers consuming fish at recreational and subsistence rates relative to White children and children not below the poverty line, respectively. For both cohorts, under the final rule, increases in avoided IQ point losses were estimated relative to the baseline across all racial or ethnic groups and income groups. These estimated increases were too small to substantially change the distribution of IQ points relative to the baseline among infants of color and among infants below the poverty level. See section 4.3 of the EJA for more information.

The EPA also evaluated human health endpoints related to lead and arsenic exposures from fish consumption. As shown in the BCA, avoided IQ point losses in children and avoided cardiovascular deaths (CVD) in adults



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from reductions in fish tissue concentrations of lead, as well as reductions in annual skin cancer cases in adults from reductions in fish tissue concentrations of arsenic estimated under the final rule were negligible (*e.g.,* a total avoided IQ point loss of one point across 1,555,558 exposed children). Therefore, the EPA determined that reporting fractional distributional changes by racial or ethnic groups and income groups for the affected population would not be informative. See section 4.3 of the EJA for more information.

3. Drinking Water

Using the results from the drinking water analysis performed in the BCA, the EPA further evaluated downstream drinking water impacts in the EJA to determine whether communities with EJ concerns served by potentially affected drinking water systems experience a differential share of bladder cancer cases from exposure to TTHM. In the BCA, the EPA modeled baseline incremental TTHM concentrations and bladder cancer cases attributable to steam electric discharges.[203] Since the EPA evaluated only the changes in TTHM concentrations and avoided bladder cancer cases and deaths attributable to steam electric discharges in the BCA, in this analysis, the EPA only evaluated whether the distribution of exposures and health effects indicated potential EJ concerns under the incremental changes resulting from the regulatory options.

The results of the EPA's analysis of changes in TTHM concentrations and resulting changes in bladder cancer cases and deaths from consuming drinking water with TTHM shows that the final rule reduces TTHM concentrations and reduces the incidence of bladder cancer cases and excess bladder cancer deaths in states with affected drinking water systems. Across the analyses, under the final rule, the majority of states with affected systems serve communities with at least one demographic group (*i.e.,* low-income or person of color) above the national average, with the largest proportion of these states having two demographic groups above the national average. Analyzing the distribution of changes across the analyses and regulatory options, the EPA finds that states with affected systems serving communities with one demographic group above the national average experience the largest median changes in TTHM concentrations and avoided bladder cancer cases and excess bladder cancer deaths than states serving communities with two and three or more demographic groups above the national average, respectively. While the magnitude of the median change observed across the analyses decreases in communities with one, two, or three or more demographic groups above the national average, the EPA finds that this is not due to there being smaller reductions in TTHM concentrations and avoided bladder cancer cases and excess bladder cancer deaths, but rather that these states generally have more systems experiencing smaller changes. See section 4.4. of the EJA for more information.

*E. Distribution of Benefits and Costs*

The EPA examined the estimated benefits and costs of the final rule for potential differences in how they are distributed across affected communities, in addition to evaluating the distribution of exposures and health impacts discussed above. Office of Management and Budget (OMB) Circular A–4, which implements E.O. 12866, states that regulatory analyses should analyze distributional effects which Circular A–4 defines as ''how the benefits and the costs of a regulatory action are ultimately experienced across the population and economy, divided up in various ways (*e.g.,* income groups, race or ethnicity, gender, sexual orientation, disability, occupation, or geography; . . .).'' As discussed below, EPA research demonstrates that climate change impacts associated with GHG reductions that are modeled to occur under this rule are likely to accrue to communities with EJ concerns but other benefits and costs under the final rule may not have substantial impacts.

The EPA began its evaluation of benefits with a screening of the benefits categories. For Option B, at both three percent and seven percent discount rates, approximately 99 percent of monetized benefits accrued from reductions in air pollution due to estimated shifts in electric generation resulting from the incremental costs of the final rule. Furthermore, these air benefits were always comprised of approximately a 3-to-1 ratio of conventional air pollutant health benefits to GHG benefits (see section 8 of the BCA for more information on air emissions and benefits).[204] Thus, while the EPA evaluated a number of exposures and endpoints for disproportionate baseline impacts, the Agency screened these two benefit categories through this initial comparison for further evaluation.

With respect to GHG benefits, scientific assessments and Agency reports produced over the past decade by the U.S. Global Change Research Program,[205] the Intergovernmental Panel on Climate Change,[206] [207] [208] [209] [210] and the National Academies of Science, Engineering, and Medicine [211] [212] provide evidence that the impacts of climate change raise potential EJ concerns. These reports conclude that poorer communities or communities of color can be especially vulnerable to climate change impacts because they tend to have limited adaptive capacities, are more dependent on climate-sensitive resources such as local water and food supplies or have less access to social and information resources. Some communities of color, specifically populations defined jointly by ethnic/

[203] Background TTHM concentrations and bladder cancer cases attributable to sources other than steam electric discharges were not modeled under the baseline but would not impact the analysis of incremental changes as discussed in the BCA.

[204] EPA scaled the air benefits to other regulatory options based on total costs.

[205] USGCRP. 2016. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. Crimmins,* Balbus, A., Gamble, J., Beard, C., Bell, J., Dodgen, D., Eisen, R., Fann, N., Hawkins, M., Herring, S., Jantarasami, L., Mills, D., Saha, S., Sarofim, M., Trtanj, J., Ziska, L. Eds. U.S. Global Change Research Program, Washington, DC, 312 pp. Available online at: *https://www.dx.doi.org/10.7930/J0R49NQX.*

[206] USGCRP. 2018. *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment.* U.S. Global Change Research Program. Available online at: *https://pp.doi.org/10.7930/NCA4.2018.*

[207] Porter, J, Xie, L., Challinor, A., Cochrane, K., Howden, S., Iqbal, M., Lobell, D., Travasso, M. 2014. *Food security and food production systems. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability.* Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change pp. 485–533.

[208] Oppenheimer, M., Campos, M., Warren, R., Birkmann, J., Luber, G., O'Neill, B., Takahashi, K. 2014. *Emergent risks and key vulnerabilities.* Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. pp. 1039–1099.

[209] Smith, K, Woodward, A., Campbell-Lendrum, D., Chadee, D., Honda, Y., Liu, Q., Olwoch, J., Revich, B., Sauerborn, R. 2014. *Human health: impacts, adaptation, and co-benefits.* Climate Change 2014. Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change pp. 709–754.

[210] IPCC (Intergovernmental Panel on Climate Change), 2018. *Global Warming of 1.5°C, An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.*

[211] National Research Council. 2011. *America's Climate Choices.* Available online at: *https://www.doi.org/10.17226/12781.*

[212] NASEM. 2017. *Communities in Action: Pathways to Health Equity.* Available online at: *https://www./doi.org/10.17226/24624.*



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racial characteristics and geographic location, may be uniquely vulnerable to climate change health impacts in the United States.

The EPA recently conducted a peer-reviewed analysis of the distribution of climate change impacts. EPA (2021) [213] evaluated the disproportionate risks to communities with EJ concerns. The EPA looked at factors including age, income, education, race, and ethnicity associated with six impact categories: air quality and health, extreme temperature and health, extreme temperature and labor, coastal flooding and traffic, coastal flooding and property, and inland flooding and property. The EPA calculated risks for each demographic group relative to its ''reference population'' (all individuals outside of each group) for scenarios with 2°C of global warming or 50 centimeters of sea level rise. The estimated risks were based on current demographic distributions in the contiguous United States. EPA (2021) includes findings that the following groups are more likely than their reference population to currently live in areas with:

- The highest increases in childhood asthma diagnoses from climate-driven changes in $PM_{2.5}$ (low-income, Black and African American, Hispanic and Latino, and Asian populations);
- The highest percentage of land lost to inundation (low-income and American Indian and Alaska Native populations);
- The highest increases in mortality rates due to climate-driven changes in extreme temperatures (low-income and Black and African American populations);
- The highest rates of labor hour losses for weather-exposed workers due to extreme temperatures (low-income, Black and African American, American Indian and Alaska Native, Hispanic and Latino, and Pacific Islander populations);
- The highest increases in traffic delays associated with high-tide flooding (low-income, Hispanic and Latino, Asian, and Pacific Islander populations); and
- The highest damages from inland flooding (Pacific Islander populations).

For further discussion of the impacts analyzed in U.S. EPA (2021) and other peer-reviewed evaluations, see section 5.1 of the EJA.

The EPA notes that the changes in GHG emissions attributable to the final rule are relatively small compared to worldwide emissions. Nevertheless, the findings of peer-reviewed evaluations demonstrate that actions that reduce GHG emissions are likely to reduce climate impacts on communities with EJ concerns. Findings demonstrate particular reductions in climate impacts for communities of color and low-income communities.

With respect to conventional air pollutant health benefits, the current EPA modeling methodology results in benefits that are proportional to exposures. In other words, the distributional findings of air pollutant exposures discussed above are the same findings the EPA has for this benefit category: exposure and health benefit improvements and degradations attributable to this final rule will be proportionately experienced by all communities evaluated. However, there are several important nuances and caveats to this conclusion owing to differences in vulnerability and health outcomes across demographic groups. For example, there is some information suggesting that the same $PM_{2.5}$ exposure reduction will reduce the hazard of mortality more so in Black populations than in White populations.[214] [215] In addition, demographic-stratified information relating $PM_{2.5}$ and ozone to other health effects and valuation estimates is currently lacking.

With respect to costs, the EPA notes that the impacts on ratepayers will depend on the degree to which compliance costs are passed through to electricity consumers via higher electricity rates. In general, lower-income households spend less, in the absolute, on energy than higher-income households, but energy expenditures represent a larger share of their income. Therefore, electricity price increases tend to have a relatively larger effect on lower-income households. Further discussion of these disparities is provided in section 5.2 of the EJA. The EPA estimated the potential impacts of incremental ELG compliance costs on households' utility bills based on average electricity consumption and assuming a worst-case scenario where all costs are passed through to consumers. The EPA estimated that the final rule (Option B) corresponds to an average increase of $3.14 per household per year, with a range of $0.19 to $5.44 per year across NERC regions. These cost increases are too small [216] to indicate the potential for significant direct impacts to household electricity consumers.[217]

## XIV. Regulatory Implementation

### *A. Continued Implementation of Existing Limitations and Standards*

The EPA has continually stressed, since the announcement of this supplemental rulemaking, that the existing 40 CFR part 423 limitations and standards in effect continue to apply.[218] In the sections below, the EPA discusses considerations for permitting authorities and regulated entities as they continue to implement existing regulations and look ahead to the regulations finalized.

#### 1. Facilities Must Still Continue To Be Permitted for, and Meet, the 2020 Rule Limitations

The EPA reaffirms that permitting authorities must continue to write permits that include existing 2015 and 2020 rule BAT limitations as applicable, whether as part of permit renewals or as part of permit modifications. Similarly, permittees must meet applicable permit limitations as soon as possible. The Agency has not issued a postponement rule for the 2020 rule FGD wastewater and BA transport water BAT limitations as it did in 2017 for the 2015 rule. And as discussed in section VII of this preamble, the EPA is retaining the 2020 FGD wastewater and BA transport water limitations and affirms that the technologies on which they are based are available and achievable, as an interim step toward meeting the final zero-discharge requirements in this rule.

Since the EPA did not postpone the earliest compliance dates in the 2020 rule,[219] which have since passed, permitting authorities should not establish an ''as soon as possible'' date that is anything other than as soon as

[213] U.S. EPA (Environmental Protection Agency). 2021. *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts.* EPA 430–R–21–003.

[214] U.S. EPA (Environmental Protection Agency). 2019. *Integrated Science Assessment (ISA) for Particulate Matter (Final Report).* December. EPA/600/R–19/188. Available at: *https://www.epa.gov/naaqs/particulate-matter-pm-standards-integrated-science-assessments-current-review.*

[215] U.S. EPA (Environmental Protection Agency). 2022. *Supplement to the 2019 Integrated Science Assessment for Particulate Matter (Final Report).* May. EPA/600/R–22/028. Available at: *https://www.epa.gov/isa/integrated-science-assessment-isa-particulate-matter.*

[216] While the incremental burden relative to income is not distributionally neutral, *i.e.,* any increase would affect lower-income households to a greater extent than higher-income households, the final rule is expected to have a very small impact in the absolute across all regions analyzed which is also small relatively as the potential price increase is between less than 0.1 percent and 0.2 percent of energy expenditures for all income and race groups, and between less than 0.1 percent and 0.5 percent of just *electricity* expenditures for all but the bottom quintile income group in the most impacted NERC region.

[217] EPA notes that other electricity consumers (*e.g.,* industrial consumers) could also face increased electricity prices.

[218] 86 FR 41801 (August 3, 2021).

[219] Compliance dates for FGD wastewater and BA transport water in the 2020 rule were as soon as possible beginning October 13, 2021.



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possible to comply with the 2020 limitations. In some cases, although unlikely at the time of this publication, a facility may still not have a permit incorporating the 2015 or 2020 rule BAT requirements. In such circumstances, a permitting authority must still include these limitations with the appropriate ''as soon as possible'' date. For example, suppose a permit applicant's permit still has the 1982 limitations; the applicant submits a permit modification request prior to this final rule effective date, but the permitting authority has not yet issued a modified permit. Here, the permitting authority may not simply issue the facility a permit incorporating this final zero-discharge limitations with a ''no later than'' date of 2029. Instead, the permittee is still obligated to meet the 2020 rule limitations no later than December 31, 2025. Note that, without the 2020 rule limitations in a permit, a facility may not participate in the permanent cessation of coal combustion by 2034 subcategory.

2. Permitting Site-Specific Technology-Based Effluent Limitations Through BPJ Analysis

At proposal, the EPA reaffirmed that BAT limitations were currently required to be developed on a BPJ basis by permitting authorities for discharges of both CRL and legacy wastewater. Some commenters contended that this outcome is improper because it does not constrain the permitting authority from selecting surface impoundments as BAT. The EPA disagrees. In *Southwestern Electric Power Co.* v. *EPA,* the Fifth Circuit stopped short of prohibiting any future selection of surface impoundments as the commenters stated. Instead, the Court held that the Agency's actions in selecting surface impoundments as BAT for legacy wastewater and CRL was arbitrary and capricious or inconsistent with the statute based on EPA's stated rationale. In particular, the Court faulted the EPA for not offering any rationale as to why surface impoundments were BAT, using the statutory factors. *See Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1018 n.20 (''[T]he record fails to explain why impoundments are BAT, if that term is to have any meaning. Furthermore, if chemical precipitation or biological treatment are technically feasible but simply too costly for treating legacy wastewater, the EPA could have said so.''); *id.* at 1025 (''The rule pegs BAT for leachate to the decades-old BPT standard, without offering any explanation for why that prior standard is now BAT. That is flatly inconsistent with the Act's careful distinction between the two standards.''). Permitting authorities performing a BPJ analysis are required to consider the statutory factors and determine what technologies are available, are economically achievable, and have acceptable non-water quality environmental impacts. Thus, permitting authorities would also be prohibited from defaulting to surface impoundments without explaining why surface impoundments represent BAT, as that term is used in the CWA. Instead, they must perform a thorough BPJ analysis that considers technologies beyond surface impoundments (including, presumably, the technologies described in this record) to identify the technology that represents BAT. The EPA does not rule out the possibility that circumstances at a facility will lead the permitting authority to select surface impoundments as BAT. However, this would only occur where a permitting authority can demonstrate that surface impoundments meet the BAT statutory factors, a tough hurdle for a treatment technology that has been found not to remove dissolved pollutants. *Id.* at 1026 (''To be sure, we do not say that EPA is precluded by the Act from ever setting BAT equivalent to a prior BPT standard. But given the plain distinction between the two standards market out in the Act, the agency would at least have to offer some explanation for its decision that speaks to the statutory differences between BAT and BPT.'').

Furthermore, the EPA received comments that certain state laws prohibit permitting authorities in those states from imposing BAT limitations more stringent than any national regulations. EPA disagrees that this poses an implementation challenge. The EPA has not established BAT based on surface impoundments, but rather, in some cases, reserved BAT limitations to be developed by permitting authorities using their BPJ. And the requirement for BPJ is to perform a thorough analysis to select the technology that represents BAT at a particular site. Thus, to the extent that a permitting authority determines a more stringent technology represents BAT at a particular site, this would not be inconsistent with the state laws cited.

3. Reopening Permits for CRL and Legacy Wastewater

At proposal, the EPA recommended, but did not require, that any permit issued or modified between the proposal and the final rule contain a reopener clause in accordance with 40 CFR 122.62(a)(7) and 124.5. Permitting authorities that included this provision should consider reopening these portions of existing permits as soon as practicable after July 8, 2024.

*B. Implementation of New Limitations and Standards*

The limitations and standards in this final rule apply to discharges from steam electric power plants through incorporation into NPDES permits issued by the EPA and authorized states under CWA section 402, and through pretreatment programs under CWA section 307. NPDES permits and pretreatment control mechanisms issued after July 8, 2024, must incorporate the ELGs, as applicable. Also, under CWA section 510, states can require effluent limitations under state law as long as they are no less stringent than the requirements of any final rule. Finally, as well as requiring application of the technology-based ELGs in any final rule, CWA section 301(b)(1)(C) requires the permitting authority to impose more stringent effluent limitations, as necessary, to meet applicable water quality standards. Relevant water quality-based considerations are discussed in section XIV.D.

1. Availability Timing of Final Rule Requirements

The direct discharge limitations in this rule apply only when implemented in an NPDES permit issued to a discharger. Under the CWA, the permitting authority must incorporate these ELGs into NPDES permits as a minimum level of control. The final rule provides the plant's permitting authority with discretion to determine the date when the new effluent limitations for FGD wastewater, BA transport water, and CRL would apply to a given discharger. For zero discharge requirements for FGD wastewater, BA transport water, and CRL, as well as the chemical precipitation-based requirements for unmanaged CRL, the limitations in this final rule become applicable by a date that is as soon as possible after July 8, 2024, but in no case later than December 31, 2029.

For dischargers subject to less stringent FGD wastewater and BA transport water limitations based on certifications that they qualify for a subcategory based on permanent cessation of coal combustion, the EPA is requiring permitting authorities to put in tiered limitations after the permanent cessation of coal combustion. For the permanent cessation of coal combustion by 2028 subcategory, the final rule contains a tiered set of limitations applicable following December 31, 2028:

- The first tier of these limitations is composed of zero-discharge limitations



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for FGD wastewater and BA transport water after April 30, 2029. These limitations would apply if the EGU had in fact permanently ceased coal combustion by December 31, 2028, as the plant represented it would. As suggested in public comments, this date is 120 days after the permanent cessation of coal combustion date, allowing for facilities to complete any necessary residual discharges.[220]

- The second tier is composed of zero-discharge limitations for these same wastewaters after December 31, 2028. If a plant fails to cease combustion of coal by 2028, as it represented it would, for any reason other than those specified in § 423.18, these zero-discharge limitations would automatically apply.

For the permanent cessation of coal combustion by 2034 subcategory, the final rule contains a tiered set of limitations applicable following December 31, 2034:

- The first tier of these limitations is composed of zero-discharge limitations for FGD wastewater and BA transport water after April 30, 2035. These limitations would apply if the EGU had in fact permanently ceased coal combustion as it represented it would.
- The second tier is composed of zero-discharge limitations for the same wastewaters, as well as CRL, after December 31, 2034. If a plant fails to cease combustion of coal by 2034, as it represented it would, for any reason other than those specified in § 423.18, these zero-discharge limitations would automatically apply.

This final rule does not affect dischargers choosing to meet the 2020 VIP effluent limitations for FGD wastewater; the date for meeting those limitations is December 31, 2028. Similarly, where a facility has elected to participate in the subcategory for permanent cessation of coal combustion by December 31, 2028, the final rule allows for the zero-discharge limitations for FGD wastewater and BA transport water to be met as late as December 31, 2029, and is not designed to impose these zero-discharge limitations prior to the tiered zero-discharge limitations established for that subcategory.[221]

Pretreatment standards, unlike effluent limitations, are directly enforceable and must specify a time for compliance not to exceed three years from the date of promulgation under CWA section 307(b)(1). Under the EPA's General Pretreatment Regulations for Existing and New Sources, POTWs with flows in excess of five MGD must develop pretreatment programs meeting prescribed conditions.[222] These POTWs have the legal authority to require compliance with applicable pretreatment standards and control the introduction of pollutants to the POTW through permits, orders, or similar means. POTWs with approved pretreatment programs act as the control authorities for their industrial users. Among the responsibilities of the control authority are the development of the specific indirect discharge limitations for the POTW's industrial users. Because pollutant discharge limitations in categorical pretreatment standards may be expressed as concentrations or mass limitations, in many cases, the control authority must convert the concentration- or mass-based limitations applicable to a specific industrial user and then include these in POTW permits or another control instrument.

Regardless of when a plant's NPDES permit is ready for renewal, the EPA recommends that each plant immediately begin evaluating how it intends to comply with the requirements of the final rule. In cases where significant changes in operation are appropriate, the EPA recommends that the plant discuss such changes with its permitting authority and evaluate appropriate steps and a timeline for the changes as soon as possible, even before the permit renewal process begins.

The ''as soon as possible'' date is the effective date of any final rule, unless the permitting authority determines another date after receiving relevant information submitted by the discharger.[223] The final rule does not revise the specified factors permitting authorities must consider in determining the as soon as possible date under the 2015 and 2020 rules. Based on receiving relevant information from the discharger, the NPDES permitting authority may determine a different date is ''as soon as possible'' within the implementation period, using the factors below:

- Time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of the final rule.
- Changes being made or planned at the plant in response to GHG regulations for new or existing fossil fuel-fired plants under the CAA, as well as regulations for the disposal of coal combustion residuals under subtitle D of RCRA.
- For FGD wastewater requirements only, an initial commissioning period to optimize the installed equipment.
- Other factors as appropriate.

The ''as soon as possible'' date determined by the permitting authority may or may not be different for each wastestream. The NPDES permitting authority should provide a well-documented justification of how it determined the ''as soon as possible'' date in the fact sheet or administrative record for the permit. If the permitting authority determines a date later than the effective date of the final rule, the justification should explain why allowing more time to meet any final limitations is appropriate, and why the discharger cannot meet the effluent limitations as of the effective date.

2. Conducting BPJ Analyses for Discharges of CRL and Legacy Wastewater

For some CRL and legacy wastewaters, the EPA is reserving BAT limitations to be determined on a case-by-case basis using the permitting authority's BPJ. The factors considered by the permit writer in a BPJ analysis are the same as those that EPA considers in establishing technology-based effluent limitations. *See* 40 CFR 125.3(d)(1) through (3). Thus, a permitting authority may not default to any technology (for example, surface impoundments) in selecting BAT, nor may a permitting authority fail to develop technology-based effluent limitations and instead simply calculate water quality-based effluent limitations. Instead, a permitting authority is required to determine limitations based on the BAT.[224]

*Consideration of Leasing.* Leasing is an option offered by commercial vendors. In some cases, it may be possible to lease various pollution treatment technologies for a timeframe shorter than the timeframes considered in this rule's primary evaluation. In

[220] The EPA notes that these do not include discharges of legacy wastewaters from surface impoundments closing under the CCR rule, which are covered by different regulatory provisions.

[221] In contrast, the subcategory for EGUs permanently ceasing coal combustion by December 31, 2028, does not cover discharges of CRL, and thus discharges of CRL would be permitted in accordance with limitations in the subcategory for EGUs permanently ceasing coal combustion by December 31, 2034.

[222] *See, e.g.,* 40 CFR 403.8(a).

[223] Information in the record indicates that most facilities should be able to complete all steps to implement changes needed to comply with the BA transport water requirements within 32 to 35 months, the FGD wastewater requirements within 28 months, and the CRL requirements within 22 months (DCN SE08480, SE10289).

[224] In doing so, permitting authorities may consider relevant information such pollution treatment technologies already in operation at the facility and the information contained in this record on the performance and costs of various technologies.



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some cases, shorter duration leases might be more costly; however, where the record precluded the EPA from establishing a nationwide BAT, it is possible that site-specific considerations may make leased equipment economically achievable for a given facility, and thus a relevant consideration in a BPJ analysis.

*Consideration of Closure Deadlines Pursuant to the CCR Rule.* For certain legacy wastewater, the EPA declined to establish a nationwide BAT, in part, due to the tight closure timeframes for CCR surface impoundments under the CCR rule. The EPA cannot evaluate the precise stage of closure each CCR surface impoundment would be in at the time of its permit issuance or renewal and whether continuation with that stage of closure would be compatible with the operation of any specific technology. In contrast, permitting authorities can do this through the BPJ process after gathering relevant information through the permit application or permit modification. This may require examination of the site-specific closure plan required under the CCR rule and any additional details regarding the ongoing closure process that are not contained in the closure plan itself.

3. Conforming Changes to § 423.18

The EPA is making two changes to § 423.18. First, the EPA is including the new permanent cessation of coal combustion by 2034 subcategory in the permit conditions of § 423.18. When an EGU proceeds towards permanent cessation of coal combustion under the new subcategory, if that EGU is involuntarily forced to burn coal beyond December 31, 2034, it may qualify for the same protections as an EGU in the permanent cessation of coal combustion by 2028 subcategory.

Second, the EPA is clarifying that an Energy Emergency Alert (EEA) is a valid order under § 423.18(a)(3) to qualify for this provision. The purpose of an EEA is to provide real-time indication of potential and actual energy emergencies within an interconnection.[225] The EPA received comment about these alerts specifically in the context of the CAA section 111 proposed rule. These are short-duration reliability events similar to the types explicitly listed in § 423.18, and this clarification is not meant to limit the use of § 423.18, but rather to ensure that it operates as intended: to allow an EGU to operate for reliability purposes without violating its CWA permit.

4. Information To Assist in Permitting Discharges of Unmanaged CRL

At proposal, the EPA provided a recommended list of information that could be provided to a permitting authority to determine whether a discharge of CRL through groundwater constituted the FEDD from a point source into a WOTUS. The EPA also solicited comment on including provision of this information as a regulatory requirement or otherwise obtaining the data (*e.g.,* through a CWA section 308 request). The EPA received a wide range of comment on this solicitation, but on November 20, 2023, the Agency published a draft guidance titled *Applying the Supreme Court's County of Maui* v. *Hawaii Wildlife Fund Decision in the Clean Water Act section 402 National Pollutant Discharge Elimination System Permit Program to Discharges through Groundwater.* The draft guidance describes the *Maui* decision's functional equivalent analysis and explains the types of information that may be relevant to determining which discharges through groundwater require coverage under an NPDES permit. This guidance will assist permitting authorities, the regulated community, and other stakeholders in appropriately applying the ''functional equivalent'' standard in the NPDES permits program and is a more appropriate instrument for addressing this particular implementation issue. The EPA intends to issue revised guidance on this topic soon. For further information visit: *https://www.epa.gov/npdes/releases-point-source-groundwater*.

*C. Reporting and Recordkeeping Requirements*

The EPA is finalizing several new or modified reporting and recordkeeping requirements in § 423.19, pursuant to authority under CWA sections 304(i) and 308. First, the EPA is including additional provisions for the annual progress reports required for EGUs permanently ceasing coal combustion by 2028. Second, the EPA is including reporting and recordkeeping requirements for the new subcategory of EGUs permanently ceasing coal combustion by 2034. Third, the EPA is including reporting and recordkeeping requirements for the subcategory for EGUs with certain discharges of unmanaged CRL. Fourth, the EPA is including reporting and recordkeeping requirements for facilities making use of the definitional changes with respect to necessary discharges of FGD wastewater, BA transport water or CRL during high intensity, infrequent storm events. Fifth, the EPA is including a one-year flexibility for EGUs that have installed zero-discharge systems to support their transition to zero discharge by allowing necessary discharges of permeate or distillate subject to reporting and recordkeeping requirements. Finally, the EPA is requiring this and all other reporting to be posted to a publicly available website.

1. Summary of Changes to the Annual Progress Reports for EGUs Permanently Ceasing Coal Combustion by 2028

The EPA is modifying the annual progress reports for the subcategory of EGUs permanently ceasing coal combustion by 2028, as it proposed it would. Specifically, the EPA is adding a requirement that the annual progress reports include either the official filing to the facility's reliability authority or a certification providing an estimate of when such a filing will be made. Furthermore, the EPA is requiring that the final annual progress report prior to permanent cessation of coal combustion must include the official filing. While facilities may already include these filings in the NOPP or annual progress reports, these filings were not explicitly required in the 2020 rule and provide the strongest assurance that a facility will not voluntarily change its plans and continue discharging beyond 2028.

2. Summary of the Reporting and Recordkeeping Requirements for EGUs Permanently Ceasing Coal Combustion by 2034

The EPA is including new reporting and recordkeeping requirements for EGUs permanently ceasing coal combustion by 2034, including an initial NOPP and annual progress reports, as it proposed it would. Consistent with the requirements for EGUs permanently ceasing coal combustion by 2028, the EPA is requiring that the initial NOPP contain several items. A NOPP shall include the expected date that each EGU is projected to achieve permanent cessation of coal combustion, whether each date represents a retirement or a fuel conversion, whether each retirement or fuel conversion has been approved by a regulatory body, and what the relevant regulatory body is. In addition, the NOPP shall include the most recent integrated resource plan for

[225] An EEA-Level 1 occurs when the ISO/RTO has enough power to meet demand but not enough backup resources. An EEA-Level 2 occurs when the ISO/RTO anticipates interruption of service and takes steps to avoid power outages by requesting outside help to meet requirements including consumers being asked to conserve energy. An EEA-Level 3 occurs when an ISO/RTO is energy deficient and operating with reserves below the required minimum. At level 3, utilities curtail energy use through controlled service interruptions.



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which the applicable state agency approved the retirement or repowering of the unit subject to the ELGs, or other documentation supporting that the electric generating unit will permanently cease the combustion of coal by December 31, 2034. The NOPP shall also include, for each such EGU, a timeline to achieve the permanent cessation of coal combustion. Each timeline shall include interim milestones and the projected dates of completion. Finally, the NOPP shall include, for each such EGU, a certification statement that the facility is in compliance with the FGD wastewater and BA transport water limitations of the 2020 rule. Because the NOPP requires a certification statement that the facility is in compliance with the FGD wastewater and BA transport water limitations of the 2020 rule, which could have applicability dates as late as December 31, 2025, EPA has finalized that date as the date for submitting the NOPP.

The EPA is also requiring an annual progress report for facilities in this subcategory. An annual progress report shall detail the completion of any interim milestones listed in the NOPP since the previous progress report, provide a narrative discussion of any completed, missed, or delayed milestones, and provide updated milestones. An annual progress report shall also include one of the following:

- A copy of the official suspension filing (or equivalent filing) made to the facility's reliability authority detailing the conversion to a fuel source other than coal;
- A copy of the official retirement filing (or equivalent filing) made to the facility's reliability authority which must include a waiver of recission rights; or
- An initial certification, or recertification for subsequent annual progress reports, containing a statement that the facility will make one of the other filings.

The certification or recertification must include the estimated date that such a filing will be made. Furthermore, the EPA is requiring that the final annual progress report must include the actual filing to the reliability authority. Thus, the final annual progress report cannot include a certification statement.

3. Summary of Reporting and Recordkeeping Requirements for Certain Discharges of Unmanaged CRL

As discussed in section VII of this preamble, CRL can be discharged not only through end-of-pipe discharges, but also through groundwater, and the EPA is establishing BAT limitations for a subcategory of EGUs that includes EGUs with discharges of CRL that a permitting authority determines are the FEDD of CRL to a WOTUS. The EPA is including annual reporting and recordkeeping requirements to facilitate the permitting authorities' review of such discharges. These requirements also facilitate compliance monitoring and make compliance information available to the public.

As it proposed it would, the EPA is requiring that facilities with discharges of CRL that a permitting authority determines are the FEDD of CRL to a WOTUS file an annual combustion residual leachate monitoring report with the permitting authority. This annual reporting requirement would be implemented via NPDES permits that cover one or more FEDD of CRL to a WOTUS through groundwater. The EPA is requiring that this report provide a comprehensive set of monitoring data. The EPA is including this requirement to facilitate permitting authorities' ability to determine compliance with CRL limitations and to increase transparency to local communities. Thus, in addition to the data provided under 40 CFR part 127, where an EGU is determined to have a FEDD of CRL, the EPA is requiring groundwater monitoring data on the CRL leaving each landfill or surface impoundment and where it enters surface waterbodies. The EPA is also requiring the report to include monitoring data on all the pollutants treated by chemical precipitation, not just mercury and arsenic, the two indicator pollutants.

4. Certification for Necessary Discharges of FGD Wastewater, BA Transport Water, or CRL During High Intensity, Infrequent Storm Events

At proposal, the EPA solicited comment on a number of topics concerning stormwater mixed with regulated process wastewaters, as well as comment on any necessary, related reporting and recordkeeping requirements. As discussed in section VII.B.5 of this preamble, the EPA is finalizing a definitional change for wastewater resulting from certain high intensity, infrequent storm events. As part of this change, the EPA is requiring a certification that includes several pieces of information that will assure the permitting authority and the public that the discharge is necessary and does not violate any other permit requirements. First, the certification shall include a statement that the facility experienced a storm event exceeding a 10-year, 24-hour or longer duration, including specifics of the actual storm event that are sufficient for a third party to verify the accuracy of the statement. Second, the certification shall include a statement that the discharge of low volume wastewater that would otherwise meet the definition of FGD wastewater, BA transport water, or CRL was necessary, including a list of the best management practices at the site and a narrative discussion of the ability of on-site equipment and practices to manage the wastewater. Third, the certification statement shall include the duration and volume of any such discharge. Finally, the certification statement shall include a statement that the discharge does not otherwise violate any other limitation or permit condition.

5. One-Year Flexibility for Any Necessary Discharges of Permeate or Distillate From Newly Operational FGD Wastewater or CRL Treatment Systems

The EPA anticipates that some plants seeking to meet the final zero-discharge limitations for FGD wastewater or CRL may install one or more technologies that produce a distillate or permeate following treatment. The EPA's technology basis incorporates a process by which the plant will recycle such distillate or permeate within the plant to achieve zero discharge. At proposal, however, the EPA solicited comment on the propriety of a limited flexibility that would allow some time for a plant to optimize its zero-discharge system to fully achieve zero discharge, subject to a reporting requirement. Importantly, for plants seeking this flexibility, a permitting authority would not include this optimization period in the calculation of the plant's ''as soon as possible'' date for meeting the FGD wastewater or CRL limitations. A plant given this flexibility would monitor and report any necessary discharges of permeate or distillate over the first year of attempted zero discharge, while the system was being optimized, and these discharges would not be a violation of the otherwise applicable zero-discharge requirements. For subsequent years, the flexibility would be discontinued.

The EPA received few comments on this solicitation, but those that were received favored the additional flexibility. On the timeframe, the EPA received comments suggesting that one or two years might be appropriate for such a flexibility. One commenter specifically discussed steps for optimizing an initial stage chemical precipitation system that could take up to two years.

The EPA agrees with commenters that the flexibility is warranted, but disagrees that two years is appropriate. In discussions with technology vendors,



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the EPA learned that new pollution control technology operators at a facility are most likely to seek vendor support during the first year of operations. Even the comment suggesting a two-year timeframe conceded, ''Commercially proven technology designs generally take a full year to optimize.'' During this optimization process, even with the flexibility to discharge permeate or distillate when necessary, the zero-discharge treatment technology will still result in significant additional pollutant removals which will only be improved upon once the optimization is complete and the permeate or distillate may no longer be discharged. The NSPS limitations established in the 2015 rule and the BAT limitations in the 2020 rule's VIP (which were developed using data from thermal evaporation systems' distillate and membrane filtration systems' permeate, respectively) result in more pollutant removals than either chemical precipitation alone or chemical precipitation plus biological treatment. By expressly allowing plants a period for optimization, and removing this optimization consideration that would otherwise allow for delayed availability timing under § 423.11(t)(3), this flexibility will also facilitate the transition to zero discharge by reducing the amount of time it would take for plants to begin full-scale use of their pollutant treatment systems. Therefore, the EPA is finalizing a flexibility in § 423.18 to allow discharges of distillate or permeate from a newly operational FGD wastewater or CRL treatment system, where necessary, in the first year of operations.

The necessary discharges included in this flexibility are subject to additional reporting and recordkeeping requirements. Specifically, the facility shall include a letter requesting this flexibility from the permitting authority. This initial request letter will detail the expected type, frequency, and duration of discharge. The letter will also include a certification that the facility has not considered the zero-discharge system optimization period in its availability timing request under § 423.11(t). After including flexibility for necessary discharges of the permeate or distillate in the permit, the permitting authority shall also extend any existing monitoring and reporting requirements to ensure that any necessary discharges of the distillate or permeate do not violate other applicable conditions of the permit such as water quality-based effluent limitations.

6. Requirement to Post Information to a Publicly Available Website

The reporting and recordkeeping requirements of the CCR rule included a novel approach for posting information to a publicly available website. This was done because, at the time the CCR rule was signed, the EPA did not have enforcement authority over the CCR rule. Thus, given the self-implementing nature of the regulations, EPA sought to make information more readily available to states, as well as members of the public, who could enforce the CCR rule through citizen suits.[226]

In contrast to the CCR rule, ELGs are implemented largely through authorized state permitting programs with EPA oversight. Nevertheless, one message that EPA received in initial outreach to communities was that there is a lack of trust of utilities (and in some cases, the states that regulate them). Another message was that there is an interest in more accessible information. At proposal, the EPA included a website posting requirement for all documentation included in § 423.19.

The EPA received comments both supporting and opposing the inclusion of a website requirement. Comments supporting the requirement desired additional transparency and suggested the EPA expand the requirement to all permitting documentation. Comments opposing the requirement expressed the opinion that these requirements would be a duplicative and unnecessary burden. One comment also pointed out that there was no provision for using a combined CCR rule/ELG rule website where a facility became subject to requirements after the effective date of the rule.

At the outset, the EPA agrees with commenters supporting a website reporting requirement. Given the success CCR rule websites have achieved in disseminating information to a variety of stakeholders, the EPA is finalizing a comparable posting requirement for the ELG rule. These websites will ensure transparency and ease of access to information. The EPA disagrees with these commenters that more is necessary. The existing reporting and recordkeeping requirements for general permitting provisions (*e.g.,* documentation during the permit application and permit modification processes, effluent reporting, etc.) are outside the scope of this rulemaking. Furthermore, even if the EPA were to consider broader changes to the reporting and recordkeeping requirements for all industrial categories, the Agency would do so through a rulemaking not specific to the steam electric power generating industry. Thus, the EPA is finalizing a website posting requirement only with respect to information contained in § 423.19.

Specifically, the EPA is requiring that all reporting and recordkeeping information not only be retained by the regulated entity and provided to the permitting authority, but that it also be posted to a public website for 10 years, or the length of the permit plus five years, whichever is longer. This posting requirement includes NOPPs and other filings that have occurred since the 2020 rule. The EPA is also allowing facilities to post on existing CCR rule compliance websites to reduce paperwork burden and make it easier for communities to access. One commenter correctly pointed out that, where facilities were not immediately subject to the reporting and recordkeeping requirements of § 423.19, it would have not been able to make the proper notification of combined CCR rule/ELG rule website usage within the proposed 60-day timeframe. Therefore, the EPA is finalizing a date for notification of this combined website that is July 8, 2024, or the date which the facility becomes subject to § 423.19 reporting requirements, whichever is later.

*D. Site-Specific Water Quality-Based Effluent Limitations*

The EPA regulations at 40 CFR 122.44(d)(1), implementing section 301(b)(1)(C) of the CWA, require each NPDES permit to include any requirements, in addition to or more stringent than ELGs or standards promulgated pursuant to sections 301, 304, 306, 307, 318, and 405 of the CWA, necessary to achieve water quality standards established under section 303 of the CWA, including state narrative criteria for water quality. Those same regulations require that limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) that the Director determines are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality. 40 CFR 122.44(d)(1)(i). In the sections below, the EPA describes the potential need to develop monitoring requirements and or limitations relating

[226] While the Water Infrastructure Improvements for the Nation Act later provided the EPA with permitting and oversight authority, the CCR rule continues to require posting to publicly available websites.



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to bromide, per- and polyfluoroalkyl substances (PFAS), and Tribal rights.

1. Bromide

The preamble to the 2015 rule discussed bromide as a parameter for which water quality-based effluent limitations may be appropriate. The EPA stated its recommendation that permitting authorities carefully consider whether water quality-based effluent limitations for bromide or TDS would be appropriate for FGD wastewater discharged from steam electric power plants upstream of drinking water intakes. The EPA also stated its recommendation that the permitting authority notify any downstream drinking water treatment plants of the discharge of bromide.

The final rule requires zero discharge of FGD wastewater, BA transport water, and CRL. Nevertheless, the EPA is finalizing subcategories for these wastewaters that will allow some discharge of these wastewaters, and all three have been shown to have measurable levels of bromide.[227] Therefore, the records for the 2015 rule, the 2020 rule, and this action continue to suggest that permitting authorities should consider establishing water quality-based effluent limitations where necessary to meet applicable water quality standards to protect of populations served by downstream drinking water treatment plants.

In consultations conducted with state and local government entities, the EPA received comments from the American Water Works Association (AWWA) and the Association of Metropolitan Water Agencies. These comments requested that the EPA consider technologies that could treat upstream pollutants at the point of discharge, but also suggested that the EPA empower states to address the issue as well. The latter discussion referenced the approaches discussed in *Methods to Assess Anthropogenic Bromide Loads from Coal-Fired Power Plants and Their Potential Effect on Downstream Drinking Water Utilities.*[228] This document, provided in comments during the 2020 rulemaking and again during consultations on the current rulemaking, describes methodologies, data sources, and considerations for constructing an approach to bromide issues on a site-specific basis. This document presents additional data sources that NPDES permitting authorities could use to establish site-specific, water quality-based effluent limitations (*see, e.g.,* Figure 29 in AWWA's document). The document also provides examples of where states have already taken similar action. For example, AWWA cites California's 0.05 mg/L standard for in-river bromide to protect public health for specific waterways and drinking water treatment systems.

2. PFAS

In addition to considering water quality-based effluent limitations for parameters present in these wastestreams, the EPA also calls attention to the need to address potential for PFAS discharges. In the EPA's *PFAS Strategic Roadmap,*[229] the Agency laid out actions that would prevent PFAS from entering the environment. Specifically, the EPA stated it would ''proactively use existing NPDES authorities to reduce discharges of PFAS at the source and obtain more comprehensive information through monitoring on the sources of PFAS and quantity of PFAS discharged by these sources.'' The EPA's Office of Water issued a memorandum in 2022, covering facilities where the EPA is the permitting authority,[230] as well as guidance to state permitting authorities to address PFAS in NPDES permits.[231] While the steam electric power sector was not identified as one of the top PFAS dischargers, the EPA notes that PFAS may nevertheless be present in steam electric discharges. For example, the Wisconsin Department of Natural Resources has found PFAS at eight power plants.[232] In addition, firefighting foam used in exercises or actual fires at steam electric power plants could contain PFAS. Therefore, permitting or control authorities may appropriately consider whether PFAS monitoring and any further restrictions (*e.g.,* BMPs) would be appropriate at a given facility.

3. Tribal Reserved Rights

A third water-quality based consideration for steam electric power plants is Tribal reserved rights. Many Tribes hold reserved rights to resources on lands and waters where states establish water quality standards, through treaties, statutes, or other sources of Federal law. The U.S. Constitution defines treaties as the supreme law of the land. On December 5, 2022, the EPA proposed revisions to the Federal water quality standards (WQS) regulation at 40 CFR part 131. *See* 87 FR 74361 (Dec. 5, 2022) (''Tribal Reserved Rights proposed rule''). The proposed revisions, if finalized, would create a regulatory framework that would be applied case-specifically to protect aquatic and aquatic-dependent resources—such as fish—reserved to Tribes through treaties, statutes, and executive orders, in WOTUS. The Tribal Reserved Rights proposed rule aims to improve protection of resources reserved to Tribes and the health of Tribal members exercising their reserved rights, as well as transparency and predictability for Tribes, states, regulated community, and the public. The EPA is working to expeditiously finalize the proposed rule, taking into account public comments. During Tribal outreach on the Steam Electric ELG rulemaking, Tribes raised concerns about potential impacts to their Tribal reserved rights. For further discussion of EPA's outreach to Tribes, see section XV.F.

*E. Severability*

The purpose of this section is to clarify the Agency's intent with respect to the severability of provisions of this rule in the event of litigation. In the event of a stay or invalidation of any part of this rule, the Agency's intent is to preserve the remaining portions of the rule to the fullest possible extent. To dispel any doubt regarding the EPA's intent and to inform how the regulation would operate if severed, the EPA has added the following regulatory text at § 423.10(b): ''The provisions of this part are separate and severable from one another. If any provision is stayed or determined to be invalid, the remaining provisions shall continue in effect.'' This rule serves in many respects to further the goals of the CWA, and the Agency would have adopted each portion of this rule independent of the other portions. As explained below, the Agency carefully crafted this rule so that each provision or element of the rule

[227] The record also includes iodide in these discharges, another pollutant which should be considered alongside bromide for water quality-based effluent limitations.

[228] Available online at: *https://www.awwa.org/Portals/0/AWWA/ETS/Resources/17861ManagingBromideREPORT.pdf?ver=2020-01-09-151706-107.*

[229] U.S. EPA (Environmental Protection Agency). 2021. *PFAS Strategic Roadmap: EPA's Commitments to Action 2021–2024.* October 18. Available online at: *https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf.*

[230] Fox, R. 2022. *Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations Where EPA is the Pretreatment Control Authority.* April 28. Available online at: *https://www.epa.gov/system/files/documents/2022-04/npdes_pfas-memo.pdf.*

[231] Fox, R. 2022. *Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs.* December 5. Available online at: *https://www.epa.gov/system/files/documents/2022-12/NPDES_PFAS_State%20Memo_December_2022.pdf.*

[232] The maximum sampled concentrations in discharge from eight steam electric power plants were 28 ng/L for perfluorooctane sulfonic acid (PFOS) and 35 ng/L for perfluorooctanoic acid (PFOA), which the Wisconsin Department of Natural Resources theorized was due to concentration in cooling tower effluent.



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can operate independently. Moreover, the Agency has organized the rule so that if any provision or element of this rule is determined by judicial review or operation of law to be invalid, that partial invalidation will not render the remainder of this rule invalid.

This rule primarily regulates discharges associated with four steam electric wastestreams. The rule provides limitations and standards associated with each wastestream in separate sections that do not rely on one another. The decision to regulate each wastestream was made independently of the decisions to regulate the other wastestreams. This is because the EPA applied the BAT statutory factors in its decision for each wastestream. This is consistent with the Fifth Circuit's decision in *Southwestern Elec. Power Co.* v. *EPA,* in which the Court held that the EPA must apply the BAT factors with respect to each wastestream, in that case CRL. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1027. Indeed, the Court ultimately vacated only those portions of the 2015 rule regulating legacy wastewater and CRL, without disturbing any further aspects of the rule. *Id.* at 1033.

This rule also contains several subcategories. The rule provides limitations and standards associated with each subcategory in separate sections, which are not relied on by other aspects of the rule. The decision to subcategorize particular discharges, for example, certain discharges of unmanaged CRL or certain discharges of legacy wastewater, had no bearing on the BAT decisions made with respect to the rest of the industry, for which the EPA finds the rule is technologically available and economically achievable after a consideration of the CWA section 304(b) factors. And each subcategory is supported by its own, independent BAT determination. Moreover, the rest of the industry's requirements are not tied in the regulatory text to the requirements of the subcategories. Similarly, the decision to subcategorize certain discharges from EGUs expected to cease combustion of coal had no bearing on the EPA's BAT decisions made with respect to the rest of the industry, for which the EPA finds the rule is technologically available and economically achievable after a consideration of the CWA section 304(b) factors. And the cease combustion of coal subcategories are supported by their own, independent BAT determinations. Moreover, the rest of the industry's requirements are not tied in the regulatory text to the requirements of the subcategories. Were the EPA to receive an adverse decision on any of the subcategories established in this rule, the EPA would expect to potentially address any remand and/or vacatur of the limitations applicable to the subcategory by considering the Court's opinion and the requisite statutory factors in re-promulgating any appropriate limitations for such subcategory. The EPA would, for example, have to demonstrate that any new limitations for the subcategory are technologically available and economically achievable for the subcategory, after a consideration of the CWA section 304(b) factors. These examples are illustrative, rather than exhaustive, and the EPA intends each portion of the rule to be independent and severable. Furthermore, if the application of any portion of this rule to a particular circumstance is determined to be invalid, the Agency intends that the rule remain applicable to all other circumstances.

## XV. Statutory and Executive Order Reviews

Additional information about these statutes and Executive orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders.*

### *A. Executive Order 12866: Regulatory Planning and Review and Executive Order 14094: Modernizing Regulatory Review*

This action is a ''significant regulatory action,'' as defined under section 3(f)(1) of Executive Order 12866, as amended by Executive Order 14094. Accordingly, the EPA submitted this action to the Office of Management and Budget (OMB) for Executive Order 12866 review. The EPA has included redline strikeout versions showing changes made in response to the Executive Order 12866 review available in the docket. The EPA prepared an analysis of the estimated costs and benefits associated with this action. This analysis is contained in section 12 of the BCA and is also available in the docket.

### *B. Paperwork Reduction Act (PRA)*

The information collection activities in this rule have been submitted for approval to the OMB under the PRA. The Information Collection Request (ICR) document that the EPA prepared has been assigned EPA ICR number 2752.02 and OMB Control Number 2040–0310. You can find a copy of the ICR in the docket for this rule, and it is briefly summarized here. The information collection requirements are not enforceable until OMB approves them.

As described in section XIV.C, the EPA is finalizing several changes to the individual reporting and recordkeeping requirements of § 423.19 for specific subcategories of plants and/or plants that have certain types of discharges. The EPA is adding reporting and recordkeeping requirements for plants in the permanent cessation of coal combustion by 2034 subcategory and for plants that discharge unmanaged CRL. EPA is also removing reporting and recordkeeping requirements for LUEGUs and finalizing a new requirement for plants to post reports to a publicly available website.

*Respondents/affected entities:* The respondents affected by this ICR are steam electric power plants. The North American Industry Classification System (NAICS) identification number applicable to respondents is 221112: Electric Power Generation Plants—Fossil Fuel Electric Power Generation. The U.S. Census Bureau describes this U.S. industry as establishments primarily engaged in operating fossil-fuel-powered electric power generation facilities. These facilities use fossil fuels, such as coal, oil, or gas, in an internal combustion or a combustion turbine conventional steam process to produce electric energy. The electric energy produced in these establishments is provided to electric power transmission systems or to electric power distribution systems.

Respondent's obligation to respond: Mandatory (40 CFR parts 423 and 122).

*Estimated number of respondents:* The EPA estimates that 236 steam electric facilities would be subject to this final rule.

*Frequency of response:* The EPA made the following assumptions for estimating frequency:

- NOPPs, notices, and the Combustion Residual Leachate Monitoring Report (CRLMR) would be submitted one time (in the first year of the requirements).
- Progress reports and the annual CRLMR would be submitted once a year following the submittal of the official NOPP (*i.e.,* twice over a three-year period).
- Progress reports associated with EPA's VIP program or NOPPs that have already been submitted would be submitted once a year following the publication of the final rule.

*Total estimated burden:* For facilities, the estimated facility universe for any reporting, for the purpose of this estimate is 236 facilities. The EPA estimates the total one-time labor hours associated with this ICR to facilities is 6,520 and total annual labor hours of 22,000 hours for a total annual average of 24,300 hours. Similarly, the EPA estimates the total one-time labor costs



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to facilities to be $650,000 and total annual labor costs of about $2,300,000 for a total annual average of $2,540,000. For permitting/control authorities, the estimated universe is 41. The EPA estimates the total one-time labor hours associated with this ICR to permitting/control authorities is 416 and total annual labor hours ranging from 3,050 to 3,160 for a total annual average of 3,230 hours. Similarly, the EPA estimates the total one-time labor costs to permitting/control authorities to be $33,300 and total annual labor costs range from $256,000 to $265,000 for a total annual average of $273,000.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the Agency will announce that approval in the **Federal Register** and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities contained in this final rule.

*C. Regulatory Flexibility Act (RFA)*

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. The small entities subject to the requirements of this action include small businesses and small governmental jurisdictions that own steam electric plants. The EPA has determined that 220 to 391 entities own steam electric power plants subject to the ELGs, of which 117 to 202 entities are small. These small entities own a total of 267 steam electric power plants (out of the total of 858 plants), including 33 to 39 plants estimated to incur costs under the final rule under the lower and upper cost scenarios, respectively. The EPA considered the impacts of the final rule on small businesses using a cost-to-revenue test. The analysis compares the cost of implementing wastewater controls under the final rule to those under baseline (which reflects the 2020 rule, as explained in section V of this preamble). Small entities estimated to incur compliance costs exceeding one or more of the one percent and three percent impact thresholds were identified as potentially incurring a significant impact. For the final rule under the lower bound cost scenario, the EPA's analysis shows 10 small entities (4 non-utilities, 3 cooperatives, and 3 municipalities) expected to incur incremental costs equal to or greater than one percent of revenue. For 5 of these small entities (2 non-utilities, 2 cooperatives, and 1 municipality), the incremental cost of the final rule exceeds three percent of revenue. For the upper bound cost scenario, an additional 2 small entities (both non-utilities) have costs equal to or greater than one percent of revenue for a total of 12 entities. For 2 non-utilities, 3 cooperatives, and 2 municipalities, these costs exceed three percent of revenue. Details of this analysis are presented in section 8 of the RIA, included in the docket.

These results support the EPA's finding of no significant impact on a substantial number of small entities.

*D. Unfunded Mandates Reform Act (UMRA)*

This action contains a Federal mandate under the UMRA, 2 U.S.C. 1531–1538 that may result in expenditures of $100 million (adjusted annually for inflation) or more for state, local, and Tribal governments, in the aggregate, or the private sector in any one year ($198 million in 2023 dollars). Accordingly, the EPA has prepared a written statement required under section 202 of UMRA. The statement is included in the docket for this action (see section 9 in the RIA) and briefly summarized below.

Consistent with the intergovernmental consultation provisions of section 204 of the UMRA, the EPA consulted with government entities potentially affected by this rule. The EPA described the government-to-government dialogue leading to the proposed rule in its preamble to the proposed rulemaking. The EPA received comments from state and local government representatives in response to the proposed rule and considered this input in developing the final rule.

Consistent with section 205, the EPA has identified and considered a reasonable number of regulatory alternatives to develop BAT. The main regulatory options are described in section VII of this preamble. These options included a range of technology-based approaches. As discussed in detail in section VII.B of this preamble, the EPA is selecting Option B as the BAT after considering the factors required under CWA section 304(b)(2)(B). The technologies are available, are economically achievable, and have acceptable non-water quality environmental impacts.

This final rule is not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. To assess the impact of compliance requirements on small governments (*i.e.,* governments with a population of less than 50,000), the EPA compared total costs and costs per plant estimated to be incurred by small governments with the costs estimated to be incurred by large governments. The EPA also compared costs for small government-owned plants with those of non-government-owned facilities. The Agency evaluated both the average and maximum annualized costs per plant under both the lower and upper bound cost scenarios. section 9 of the RIA provides details of these analyses. In all these comparisons, both for the cost totals and, in particular, for the average and maximum cost per plant, the costs for small government-owned facilities were less than those for small non-government-owned facilities. This was true for both the lower and upper bound cost scenarios. The maximum cost per plant was also smaller for the small government-owned plants vs. the large government-owned plants under the lower bound cost scenario. The average annualized costs per plant were larger for small government-owned plants vs. large government-owned plants under the upper bound cost scenario, but not markedly so. On this basis, the EPA concludes that the compliance cost requirements of the steam electric ELGs would not significantly or uniquely affect small governments.

*E. Executive Order 13132: Federalism*

The EPA has concluded that this action has federalism implications because it imposes direct compliance costs on state or local governments, and the Federal Government will not provide the funds necessary to pay those costs.

As discussed in section XV.B, the EPA anticipates that this final rule does not impose incremental administrative burden on states from issuing, reviewing, and overseeing compliance with discharge requirements. The EPA has identified 148 steam electric power plants owned by 63 state or local government entities. Under the final rule, the EPA projects that 15 government-owned plants would incur compliance costs. The EPA estimates the maximum compliance cost in any one year to governments (excluding the Federal Government) for the final rule range from $155 million and $220 million, whereas the annualized costs range between $40 million and $67 million (see section 9 of the RIA for details).

The EPA provides the following federalism summary impact statement.

The EPA consulted with state and local officials early in the process of developing the rule to permit them to

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have meaningful and timely input into its development. The preamble to the proposed rule described these consultations, which included a meeting held on January 27, 2022, attended by representatives from 15 state and local government organizations and outreach with several intergovernmental associations representing elected officials and encouraged their members to participate in the meeting, including the National Governors Association, the National Conference of State Legislatures, the Council of State Governments, the National Association of Counties, the National League of Cities, the U.S. Conference of Mayors, the County Executives of America, and the National Associations of Towns and Townships.

The EPA received five sets of unique written comments after the meeting and considered these comments in the development of the proposed rule. For further information regarding the consultation process and supplemental materials provided to state and local government representatives, please go to the steam electric power generating effluent guidelines website at: *https://www.epa.gov/eg/2021-supplemental-steam-electric-rulemaking.*

The EPA received comment on the proposed ELGs from three state and local officials or their representatives. Some state and local officials expressed concerns the EPA had underestimated the costs and overstated the pollutant removals of the technology options. Commenters stated that the ELGs would impose significant costs on small entities and would result in electricity rate increases that are unaffordable for households. Commenters also expressed concern about coordination of the various rules affecting the power sector. The EPA considered these comments in developing the final rule.

A list of the state and local government commenters has been provided to OMB and has been placed in the docket for this rulemaking. In addition, the detailed response to comments from these entities is contained in the EPA's response to comments document on this final rulemaking, which has also been placed in the docket for this rulemaking.

As explained in section VII of this preamble, the EPA is establishing more stringent limitations on several wastestreams that would alleviate concerns raised by the public water systems. At the same time, the EPA's final rule includes subcategories for units certifying to the permanent cessation of coal combustion. The EPA believes these differentiated requirements alleviate some of the concerns raised by publicly owned utilities. Further, as explained in section VIII of this preamble, the EPA's analysis demonstrates that the final requirements are economically achievable for the steam electric power generating industry as a whole and for plants owned by state or local government entities.

### *F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments*

This action has Tribal implications; however, it will neither impose substantial direct compliance costs on federally recognized Tribal governments, nor preempt Tribal law, as specified in Executive Order 13175. *See* 65 FR 67249 (November 9, 2000). It does not have substantial direct effects on Tribal governments, on the relationship between the Federal Government and the Indian Tribes, or the distribution of power and responsibilities between the Federal Government and Indian Tribes as specified in Executive Order 13175. The EPA's analyses show that no facility subject to the final ELGs is owned by Tribal governments. Thus, Executive Order 13175 does not apply to this action. The EPA acknowledges this action has Tribal implications, not prescribed in Executive Order 13175, because during Tribal Consultation, the EPA received written comments from 3 Tribal nations that conveyed the importance of historical Tribal waters and rights (*e.g.,* fishing, trapping), recommended more stringent technological controls to protect those rights, or encouraged retirement or fuel conversion of old coal-fired EGUs.

Although Executive Order 13175 does not apply to this action, the EPA consulted with Tribal officials early in the process of developing this rule to enable them to have meaningful and timely input into its development. The EPA initiated consultation and coordination with federally recognized Tribal governments in January 2022, sharing information about the steam electric effluent guidelines rulemaking with the National Tribal Caucus, the National Tribal Water Council, and several individual Tribes. The EPA continued this government-to-government dialogue and, on February 1 and February 9, 2022, invited Tribal representatives to participate in further discussions about the rulemaking process and objectives, with a focus on identifying specific ways the rulemaking may affect Tribes.[233] The consultation process ended on March 29, 2022. The EPA is including in the docket for this action a memorandum that provides a response to the comments it received through this consultation and the consultations described in sections XVI.D and XVI.E of this preamble. For further information regarding the consultation process and supplemental materials provided to Tribal representatives, please go to the steam electric power generating effluent guidelines website at: *https://www.epa.gov/eg/2021-supplemental-steam-electric-rulemaking.*

Representatives from several Tribes provided input to the rule. The EPA considered input from Tribal representatives in developing this final rule.

### *G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks*

Executive Order 13045 directs Federal agencies to include an evaluation of the health and safety effects of the planned regulation on children in Federal health and safety standards and explain why the regulation is preferable to potentially effective and reasonably feasible alternatives. This action is not subject to Executive Order 13045 because the EPA does not believe the environmental health risks or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessments are discussed in sections 4 and 5 of the BCA and are summarized below.

The EPA identified several ways in which the final rule will benefit children, including by potentially reducing health risks from exposure to pollutants present in steam electric power plant discharges, or through impacts of the discharges on the quality of source water used by public water systems. This reduction arises from more stringent pollutant limitations as compared to baseline. The EPA quantified the changes in IQ losses from lead exposure among preschool children and from mercury exposure *in utero* resulting from maternal fish consumption under the final rule as compared to baseline. The EPA also estimated changes in the lifetime risk of developing bladder cancer due to exposure to TTHM in drinking water, or of cardiovascular premature mortality from exposure to lead. For these analyses, the EPA did not estimate children-specific risks because these adverse health effects normally follow

[233] As discussed in sections XIII and XVI.J, the EPA also did targeted outreach to communities in the top tier of its EJ screening analysis which included two tribal communities.



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long-term exposure. Finally, the EPA estimated changes in air-related adverse health effects resulting from changes in the profile of electricity generation under the final rule as compared to baseline. The analysis found that the resulting reductions in $PM_{2.5}$ and ozone will benefit children by reducing asthma onset and symptoms, allergy symptoms, emergency room visits and hospital visits for respiratory conditions, and school absences.

However, the EPA's Policy on Children's Health applies to this action. Information on how the Policy was applied is available under ''Children's Environmental Health'' in this **SUPPLEMENTARY INFORMATION** section.

*H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use*

This final action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. The EPA analyzed the potential energy effects of the final rule relative to baseline and found minimal or no impacts on electricity generation, generating capacity, cost of energy production, or dependence on a foreign supply of energy. Specifically, the Agency's analysis found that the final rule would not reduce electricity production by more than 1 billion kWhs per year or by 500 MW of installed capacity, nor would the final rule increase U.S. dependence on foreign energy supplies. For more detail on the potential energy effects of this action, see section 10.7 in the RIA, available in the docket.

*I. National Technology Transfer and Advancement Act*

This rulemaking does not involve technical standards.

*J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 14096: Revitalizing Our Nation's Commitment to Environmental Justice for All*

The EPA believes that the human health or environmental conditions existing prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on communities with EJ concerns. Current research suggests that coal-fired power plants tend to be in low-income communities, Indigenous communities, and communities of color. Toomey (2013) reported that 78 percent of African Americans in the United States live within a 30-mile radius of a coal-fired power plant.[234] Impacts discussed in the reports included adverse health impacts resulting from air pollutants (*e.g.,* $SO_2$, $NO_X$, $PM_{2.5}$) for those living in proximity to coal-fired power plants, climate justice issues resulting from GHG emissions, and risk of impoundment failures for populations living in proximity to coal waste surface impoundments where coal is mined.[235] [236] [237] All these impacts were found in one or more papers to disproportionately impact low-income, minority, and Indigenous communities. The EPA also conducted a proximity analysis to characterize the demographics of communities potentially exposed to pollution from steam electric power plant wastewater discharges through proximity to plants, proximity to downstream surface waters receiving, or being served by a PWS using impacted downstream receiving waters as source water for drinking water. The results of the EPA's analysis showed that these communities have higher proportions of low-income individuals and people of color compared to the national average, national rural average, and respective state averages suggesting potential EJ concerns under the baseline in terms of disproportionate exposures. The EPA believes that this action is likely to reduce existing disproportionate and adverse effects on communities with EJ concerns. The EPA's EJ analysis showed the final rule will reduce differential baseline exposures for low-income communities and communities of color to pollutants in wastewater and resulting human impacts. Improvements to water quality, wildlife, and human health resulting from reductions in pollutants in surface water will be distributed more among communities with EJ concerns under some or all of the regulatory options due to their disproportionate exposures under the baseline. Drinking water improvements will also be distributed more among communities with EJ concerns under the final rule due to their disproportionate exposures under the baseline. Remaining exposures, impacts, and benefits analyzed are small enough that EPA could not conclude whether changes in disproportionate impacts under the baseline would occur. While the changes in GHGs attributable to the final rule are small compared to worldwide emissions, findings from peer-reviewed evaluations demonstrate that actions that reduce GHG emissions are also likely to reduce climate-related impacts on vulnerable communities, including communities with EJ concerns. Costs of the final rule in terms of electricity price increases among residential households may impact low-income households and households of color more relative to all households as low-income households and households of color tend to spend a greater proportion of their income on energy expenditures. Despite this, the potential price increases under the upper bound cost scenario represent between less than 0.1 percent and 0.2 percent of energy expenditures for all income, race groups, and income quintiles, and therefore the EPA does not expect costs to have a substantial impact on low-income households and households of color.

*K. Congressional Review Act (CRA)*

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action meets the criteria set forth in 5 U.S.C. 804(2).

**Appendix A to the Preamble: Definitions, Acronyms, and Abbreviations Used in This Preamble**

The following acronyms, abbreviations, and terms are used in this preamble. These terms are provided the reader's for convenience; they are not regulatory definitions with the force or effect of law, nor are they to be used as guidance for implementation of this rule.

*Administrator.* The Administrator of the U.S. Environmental Protection Agency.

*Agency.* U.S. Environmental Protection Agency.

*BAT.* Best available technology economically achievable, as defined by CWA sections 301(b)(2)(A) and 304(b)(2)(B).

*BA transport water.* Wastewater that is used to convey bottom ash from the ash collection or storage equipment, or boiler, and has direct contact with the ash.

*BCA.* Abbreviation used for the *Benefit and Cost Analysis for the Final Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* report.

[234] Toomey, D. 2013. *Coal Pollution and the Fight for Environmental Justice.* Yale Environment 360. June 19. Available online at: *https://www.e360.yale.edu/features/naacp_jacqueline_patterson_coal_pollution_and_fight_for_environmental_justice.*

[235] Liévanos, R., Greenberg, P., Wishart, P. 2018. *In the Shadow of Production: Coal Waste Accumulation and Environmental Inequality Formation in Eastern Kentucky,* pp. 37–55.

[236] Israel, B. 2012. *Coal Plants Smother Communities of Color. https://www.scientificamerican.com/article/coal-plants-smother-communities-of-color/#:~:text=People%20living%20near%20coal%20plants,percent%20are%20people%20of%20color.*

[237] NAACP (National Association for the Advancement of Colored People). 2012. *Coal Blooded: Putting Profits Before People. www.naacp.org/resources/coal-blooded-putting-profits-people.*



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*Bioaccumulation.* A general term describing a process by which chemicals are taken up by an organism either directly from exposure to a contaminated medium or by consumption of food containing the chemicals, resulting in a net accumulation of the chemical over time by the organism.

*BMP.* Best management practice.

*BA.* Bottom ash. The ash, including EGU slag, that settles in a furnace or is dislodged from furnace walls. Economizer ash is included when it is collected with BA.

*BA purge water.* The water discharged from a wet BA handling system that recycles some, but not all, of its BA transport water.

*BPT.* The best practicable control technology currently available, as defined by CWA sections 301(b)(1) and 304(b)(1).

*CBI.* Confidential business information.

*CCR.* Coal combustion residuals.

*CWA.* Clean Water Act; the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1251 *et seq.*), as amended, *e.g.,* by the Clean Water Act of 1977 (Pub. L. 95–217) and the Water Quality Act of 1987 (Pub. L. 100–4).

*Combustion residuals.* Solid wastes associated with combustion-related steam electric power plant processes, including fly ash and BA from coal-, petroleum coke-, or oil-fired units; FGD solids; FGMC wastes; and other wastewater treatment solids associated with steam electric power plant wastewater. In addition to the residuals associated with coal combustion, this also includes residuals associated with the combustion of other fossil fuels.

*CRL.* Combustion residual leachate. Leachate from landfills or surface impoundments that contains combustion residuals. Leachate is composed of liquid, including any suspended or dissolved constituents in the liquid, that has percolated through waste or other materials emplaced in a landfill, or that passes through the surface impoundment's containment structure (*e.g.,* bottom, dikes, berms). Combustion residual leachate includes seepage and/or leakage from a combustion residual landfill or impoundment unit. It also includes wastewater from landfills and surface impoundments located on non-adjoining property when under the operational control of the permitted facility.

*CWA.* Clean Water Act.

*Direct discharge.* (1) Any addition of any ''pollutant'' or combination of pollutants to ''waters of the United States'' from any ''point source'' or (2) any addition of any pollutant or combination of pollutant to waters of the ''contiguous zone'' or the ocean from any point source other than a vessel or other floating craft that is being used as a means of transportation. This definition includes additions of pollutants into waters of the United States from surface runoff that is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a state, municipality, or other person that do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances that lead into privately owned treatment works. This term does not include addition of pollutants by any ''indirect discharger.''

*Direct discharger.* A plant that discharges treated or untreated wastewaters into waters of the United States.

*DOE.* Department of Energy.

*Dry BA handling system.* A system that does not use water as the transport medium to convey BA away from the EGU. Dry-handling systems include systems that collect and convey the BA without using any water, as well as systems in which BA is quenched in a water bath and then mechanically or pneumatically conveyed away from the EGU. Dry BA handling systems do not include wet sluicing systems (such as remote MDS or complete recycle systems).

*Effluent limitation.* Under CWA section 502(11), any restriction, including schedules of compliance, established by a state or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents that are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean.

*EGU.* Electric generating unit.

*EIA.* Energy Information Administration.

*EJA.* Abbreviation used for the *Environmental Justice Analysis for the Final Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* report.

*ELGs.* Effluent limitations guidelines and standards.

*E.O.* Executive order.

*EPA.* U.S. Environmental Protection Agency.

*FA.* Fly ash. The ash that is carried out of the furnace by a gas stream and collected by a capture device such as a mechanical precipitator, electrostatic precipitator, and/or fabric filter. Economizer ash is included in this definition when it is collected with FA. Ash is not included in this definition when it is collected in wet scrubber air pollution control systems whose primary purpose is particulate removal.

*Facility.* Any NPDES ''point source'' or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

*FA transport water.* Wastewater that is used to convey fly ash from the ash collection or storage equipment, or boiler, and has direct contact with the ash.

*FGD.* Flue gas desulfurization.

*FGMC.* Flue gas mercury control.

*FGD wastewater.* Wastewater generated specifically from the wet FGD scrubber system that contacts the flue gas or the FGD solids, including, but not limited to, the blowdown or purge from the FGD scrubber system, overflow or underflow from the solids separation process, FGD solids wash water, and the filtrate from the solids dewatering process. Wastewater generated from cleaning the FGD scrubber, cleaning FGD solids separation equipment, cleaning FGD solids dewatering equipment, or that is collected in floor drains in the FGD process area is not considered FGD wastewater.

*FGMC wastewater.* Any wastewater generated from an air pollution control system installed or operated for the purpose of removing mercury from flue gas. This includes wastewater from fly ash collection systems when the particulate control system follows sorbent injection or other controls to remove mercury from flue gas. FGD wastewater generated at plants using oxidizing agents to remove mercury in the FGD system and not in a separate FGMC system is not considered FGMC wastewater.

*Gasification wastewater.* Any wastewater generated at an integrated gasification combined cycle operation from the gasifier or the syngas cleaning, combustion, and cooling processes. Gasification wastewater includes, but is not limited to, the following: sour/grey water; $CO_2$/steam stripper wastewater; sulfur recovery unit blowdown; and wastewater resulting from slag handling or fly ash handling, particulate removal, halogen removal, or trace organic removal. Air separation unit blowdown, noncontact cooling water, and runoff from fuel and/or byproduct piles are not considered gasification wastewater. Wastewater that is collected intermittently in floor drains in the gasification process area from leaks, spills, and cleaning occurring during normal operation of the gasification operation is not considered gasification wastewater.

*Groundwater.* Water that is found in the saturated part of the ground underneath the land surface.

*Indirect discharge.* Wastewater discharged or otherwise introduced to a POTW.

*IPM.* Integrated Planning Model.

*Landfill.* A disposal facility or part of a facility or plant where solid waste, sludges, or other process residuals are placed in or on any natural or manmade formation in the earth for disposal and which is not a storage pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome or salt bed formation, an underground mine, a cave, or a corrective action management unit.

*Legacy wastewater.* FGD wastewater, BA transport water, FA transport water, CRL, gasification wastewater and/or FGMC wastewater generated before the ''as soon as possible'' date that more stringent effluent limitations from the 2015 or 2020 rules would apply.

*MDS.* Mechanical drag system.BA handling system that collects BA from the bottom of an EGU in a water-filled trough. The water bath in the trough quenches the hot BA as it falls from the EGU and seals the EGU gases. A drag chain operates in a continuous loop to drag BA from the water trough up an incline, which dewaters the BA by gravity, draining the water back to the trough as the BA moves upward. The dewatered BA is often conveyed to a nearby collection area, such as a small bunker outside the EGU building, from which it is loaded onto trucks and either sold or transported to a landfill. The MDS is considered a dry BA handling system because the ash transport mechanism is mechanical removal by the drag chain, not the water.

*Mortality.* Death rate or proportion of deaths in a population.

*NAICS.* North American Industry Classification System.

*NPDES.* National Pollutant Discharge Elimination System.

*NSPS.* New Source Performance Standards.



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*ORP.* Oxidation-reduction potential.

*Paste.* A substance containing solids in a fluid which behaves as a solid until a force is applied that causes it to behave like a fluid.

*Paste landfill.* A landfill that receives any paste designed to set into a solid after the passage of a reasonable amount of time.

*Point source.* Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel, or other floating craft from which pollutants are or may be discharged. The term does not include agricultural stormwater discharges or return flows from irrigated agriculture. *See* CWA section 502(14), 33 U.S.C. 1362(14); 40 CFR 122.2.

*POTW.* Publicly owned treatment works. *See* CWA section 212, 33 U.S.C. 1292; 40 CFR 122.2, 403.3.

*PSES.* Pretreatment Standards for Existing Sources.

*PSC.* Public service commission.

*PUC.* Public utility commission.

*RCRA.* The Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901 *et seq.*

*Remote MDS.* BA handling system that collects BA at the bottom of the EGU, then uses transport water to sluice the ash to a remote MDS that dewaters BA using a configuration similar to MDS. The remote MDS is considered a wet BA handling system because the ash transport mechanism is water.

*RO.* Reverse osmosis.

*RFA.* Regulatory Flexibility Act.

*SBA.* Small Business Administration.

*Sediment.* Particulate matter lying below water.

*Surface water.* All waters of the United States, including rivers, streams, lakes, reservoirs, and seas.

*TDD.* Abbreviation used for the *Technical Development Document for the Final Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* report.

*Toxic pollutants.* As identified under the CWA, 65 pollutants and classes of pollutants, of which 126 specific substances have been designated priority toxic pollutants. *See* appendix A to 40 CFR part 423.

*Transport water.* Wastewater that is used to convey FA, BA, or economizer ash from the ash collection or storage equipment or EGU and that has direct contact with the ash. Transport water does not include low-volume, short-duration discharges of wastewater from minor leaks (*e.g.,* leaks from valve packing, pipe flanges, or piping) or minor maintenance events (*e.g.,* replacement of valves or pipe sections).

*UMRA.* Unfunded Mandates Reform Act.

*Wet BA handling system.* A system in which BA is conveyed away from the EGU using water as a transport medium. Wet BA systems typically send the ash slurry to dewatering bins or a surface impoundment. Wet BA handling systems include systems that operate in conjunction with a traditional wet sluicing system to recycle all BA transport water (*e.g.,* remote MDS or complete recycle systems).

*Wet FGD system.* Wet FGD systems capture sulfur dioxide from the flue gas using a sorbent that has mixed with water to form a wet slurry, and that generates a water stream that exits the FGD scrubber absorber.

**List of Subjects in 40 CFR Part 423**

Environmental protection, Electric power generation, Power facilities, Waste treatment and disposal, Water pollution control.

**Michael S. Regan,**

*Administrator.*

For the reasons stated in the preamble, the Environmental Protection Agency amends 40 CFR part 423 as follows:

## PART 423—STEAM ELECTRIC POWER GENERATING POINT SOURCE CATEGORY

■ 1. The authority citation for part 423 is revised to read as follows:

**Authority:** 33 U.S.C. 1251 *et seq.;* 1311; 1314(b), (c), (e), (g), and (i)(A) and (B); 1316; 1317; 1318 and 1361.

■ 2. Revise § 423.10 to read as follows:

### § 423.10 Applicability and severability.

(a) *Applicability.* The provisions of this part apply to discharges resulting from the operation of a generating unit by an establishment whose generation of electricity is the predominant source of revenue or principal reason for operation, and whose generation of electricity results primarily from a process utilizing fossil-type fuel (coal, oil, or gas), fuel derived from fossil fuel (*e.g.,* petroleum coke, synthesis gas), or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium. This part applies to discharges associated with both the combustion turbine and steam turbine portions of a combined cycle generating unit.

(b) *Severability.* The provisions of this part are separate and severable from one another. If any provision is stayed or determined to be invalid, the remaining provisions shall continue in effect.

■ 3. Amend § 423.11 by revising paragraphs (n), (p), (r), (w), (z), and (bb) and adding paragraphs (ee) and (ff) to read as follows:

### § 423.11 Specialized definitions.

* * * * *

(n) The term *flue gas desulfurization (FGD) wastewater* means any wastewater generated specifically from the wet flue gas desulfurization scrubber system that comes into contact with the flue gas or the FGD solids, including but not limited to, the blowdown from the FGD scrubber system, overflow or underflow from the solids separation process, FGD solids wash water, and the filtrate from the solids dewatering process. Wastewater generated from cleaning the FGD scrubber, cleaning FGD solids separation equipment, cleaning FGD solids dewatering equipment; FGD paste equipment cleaning water; treated FGD wastewater permeate or distillate used as boiler makeup water; water that is collected in floor drains in the FGD process area; wastewater removed from FGD wastewater treatment equipment within the first 120 days of decommissioning the equipment, or wastewater generated by a 10-year, 24-hour or longer duration storm event when meeting the certification requirements in § 423.19(o) is not considered FGD wastewater.

* * * * *

(p) The term *transport water* means any wastewater that is used to convey fly ash, bottom ash, or economizer ash from the ash collection or storage equipment, or boiler, and has direct contact with the ash. Transport water does not include low volume, short duration discharges of wastewater from minor leaks (*e.g.,* leaks from valve packing, pipe flanges, or piping), minor maintenance events (*e.g.,* replacement of valves or pipe sections), FGD paste equipment cleaning water, bottom ash purge water, wastewater removed from ash handling equipment within the first 120 days of decommissioning the equipment, or wastewater generated by a 10-year, 24-hour or longer duration storm event when meeting the certification requirements in § 423.19(o).

* * * * *

(r) The term *combustion residual leachate* means leachate from landfills or surface impoundments containing combustion residuals. Leachate is composed of liquid, including any suspended or dissolved constituents in the liquid, that has percolated through waste or other materials emplaced in a landfill, or that passes through the surface impoundment's containment structure (*e.g.,* bottom, dikes, berms). Combustion residual leachate includes seepage and/or leakage from a combustion residual landfill or impoundment unit. Combustion residual leachate includes wastewater from landfills and surface impoundments located on non-adjoining property when under the operational control of the permitted facility. Combustion residual leachate does not include wastewater generated by a 10-year, 24-hour or longer duration storm event when meeting the certification requirements in § 423.19(o).

* * * * *

(w) The term *permanent cessation of coal combustion* means the owner or operator certifies under § 423.19(g) or (h) that an electric generating unit will cease combustion of coal no later than December 31, 2028, or December 31, 2034.

* * * * *

(z) The term *low utilization electric generating unit* means any electric generating unit for which the facility owner certifies, and annually recertifies, under § 423.19(f) that the two-year average annual capacity utilization rating is less than 10 percent.

* * * * *

(bb) The term *tank* means a stationary device, designed to contain an accumulation of wastewater which is constructed primarily of non-earthen materials (*e.g.,* wood, concrete, steel, plastic) which provide structural support and which is not a coal combustion residual surface impoundment.

* * * * *

(ee) The term *coal combustion residual surface impoundment* means a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of coal combustion residuals and liquids, and the unit treats, stores, or disposes of coal combustion residuals.

(ff) The term *unmanaged combustion residual leachate* means combustion residual leachate which either:

(1) Is determined by the permitting authority to be the functional equivalent of a direct discharge to waters of the United States (WOTUS) through groundwater; or

(2) Has leached from a waste management unit into the subsurface and mixed with groundwater prior to being captured and pumped to the surface for discharge directly to WOTUS.

■ 4. Amend § 423.13 by:

■ a. Revising paragraph (g);

■ b. Adding a heading for paragraph (h);

■ c. Revising paragraph (h)(1)(ii);

■ d. Adding a heading for paragraph (i);

■ e. Revising paragraph (i)(1)(ii); and

■ f. Revising paragraphs (k), (l), and (o).

The revisions and additions read as follows:

**§ 423.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).**

* * * * *

(g) *FGD wastewater*—(1) *2020 BAT.* (i) Except for those discharges to which paragraph (g)(2) or (3) of this section applies, the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in table 5 to this paragraph (g)(1)(i). Dischargers must meet the effluent limitations for FGD wastewater in this paragraph (g)(1)(i) by a date determined by the permitting authority that is as soon as possible beginning October 13, 2021, but no later than December 31, 2025. The effluent limitations in this paragraph (g)(1)(i) apply to the discharge of FGD wastewater generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph (g)(1)(i), until the date determined by the permitting authority for meeting the effluent limitations in paragraph (g)(4) of this section.

TABLE 5 TO PARAGRAPH (g)(1)(i)

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 18 | 8 |
| Mercury, total (ng/L) | 103 | 34 |
| Selenium, total (µg/L) | 70 | 29 |
| Nitrate/nitrite as N (mg/L) | 4 | 3 |

(ii) For FGD wastewater generated before the date determined by the permitting authority, as specified in paragraph (g)(1)(i) of this section, the EPA is declining to establish BAT limitations and is reserving such limitations to be established by the permitting authority on a case-by-case basis using the permitting authority's best professional judgment.

(2) *2020 BAT subcategories.* (i) For any electric generating unit with a total nameplate capacity of less than or equal to 50 megawatts, that is an oil-fired unit, or for which the owner has submitted a certification pursuant to § 423.19(g), the quantity of pollutants discharged in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed for total suspended solids (TSS) in § 423.12(b)(11).

(A) For any electric generating unit for which the owner has submitted a certification pursuant to § 423.19(g), where such unit has permanently ceased coal combustion by December 31, 2028, there shall be no discharge of pollutants in FGD wastewater after April 30, 2029.

(B) For any electric generating unit for which the owner has submitted a certification pursuant to § 423.19(g), where such unit has failed to permanently cease coal combustion by December 31, 2028, there shall be no discharge of pollutants in FGD wastewater after December 31, 2028.

(ii) For FGD wastewater discharges from a high FGD flow facility, the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in table 6 to this paragraph (g)(2)(ii). Dischargers must meet the effluent limitations for FGD wastewater in this paragraph (g)(2)(ii) by a date determined by the permitting authority that is as soon as possible beginning October 13, 2021, but no later than December 31, 2023. The effluent limitations in this paragraph (g)(2)(ii) apply to the discharge of FGD wastewater generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph (g)(2)(ii), until the date determined by the permitting authority for meeting the effluent limitations in paragraph (g)(4) of this section.

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TABLE 6 TO PARAGRAPH (g)(2)(ii)

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

(iii) For FGD wastewater discharges from a low utilization electric generating unit, the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in table 6 to paragraph (g)(2)(ii) of this section. Dischargers must meet the effluent limitations for FGD wastewater in this paragraph (g)(2)(iii) by a date determined by the permitting authority that is as soon as possible beginning October 13, 2021, but no later than December 31, 2023. These effluent limitations apply to the discharge of FGD wastewater generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph (g)(2)(iii), until the date determined by the permitting authority for meeting the effluent limitations in paragraph (g)(4) of this section.

(3) *Voluntary incentives plan.* (i) For dischargers who voluntarily choose to meet the effluent limitations for FGD wastewater in this paragraph (g)(3)(i), the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in table 7 to this paragraph (g)(3)(i). Dischargers who choose to meet the effluent limitations for FGD wastewater in this paragraph (g)(3)(i) must meet such limitations by December 31, 2028. The effluent limitations in this paragraph (g)(3)(i) apply to the discharge of FGD wastewater generated on and after December 31, 2028.

TABLE 7 TO PARAGRAPH (g)(3)(i)

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (ug/L) | 5 | NA |
| Mercury, total (ng/L) | 23 | 10 |
| Selenium, total (ug/L) | 10 | NA |
| Nitrate/Nitrite (mg/L) | 2.0 | 1.2 |
| Bromide (mg/L) | 0.2 | NA |
| TDS (mg/L) | 306 | 149 |

(ii) For discharges of FGD wastewater generated before December 31, 2023, the quantity of pollutants discharged in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed for TSS in § 423.12(b)(11).

(4) *2024 BAT.* (i) Except for those discharges to which paragraphs (g)(3) and (g)(4)(ii) through (iv) of this section applies, there shall be no discharge of pollutants in FGD wastewater.

(A) Dischargers must meet the effluent limitations for FGD wastewater in this paragraph (g)(4)(i) by a date determined by the permitting authority that is as soon as possible beginning July 8, 2024, but no later than December 31, 2029. These effluent limitations apply to the discharge of FGD wastewater generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph (g)(4)(i).

(B) A facility which submits a request under § 423.19(n) may discharge permeate or distillate from an FGD wastewater treatment system designed to achieve the limitations in this paragraph (g)(4)(i) for an additional period of up to one year from the date determined in paragraph (g)(4)(i)(A) of this section.

(ii) For any electric generating unit with a total nameplate capacity of less than or equal to 50 megawatts or that is an oil-fired unit, the quantity of pollutants discharged in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed for TSS in § 423.12(b)(11).

(iii) For any electric generating unit for which the owner has submitted a certification pursuant to § 423.19(h), the quantity of pollutants discharged in FGD wastewater shall continue to be subject to limitations specified in paragraph (g)(1) or (g)(2)(ii) or (iii) of this section as incorporated into the existing permit.

(A) Where such unit has permanently ceased coal combustion by December 31, 2034, there shall be no discharge of pollutants in FGD wastewater after April 30, 2035.

(B) Where such unit has failed to permanently cease coal combustion by December 31, 2034, there shall be no discharge of pollutants in FGD wastewater after December 31, 2034.

(iv) For FGD wastewater discharged from any coal combustion residual surface impoundment which commences closure pursuant to 40 CFR 257.102(e) after July 8, 2024, the quantity of pollutants in FGD



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wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in table 8 to this paragraph (g)(4)(iv).

TABLE 8 TO PARAGRAPH (g)(4)(iv)

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

(h) *Fly ash transport water.* (1) * * *

(ii) *Legacy fly ash transport water.* For fly ash transport water generated before the date determined by the permitting authority, as specified in paragraph (h)(1)(i) of this section, the EPA is declining to establish BAT limitations and is reserving such limitations to be established by the permitting authority on a case-by-case basis using the permitting authority's best professional judgment.

* * * * *

(i) *Flue gas mercury control wastewater.* (1) * * *

(ii) *Legacy flue gas mercury control wastewater.* For flue gas mercury control wastewater generated before the date determined by the permitting authority, as specified in paragraph (i)(1)(i) of this section, the EPA is declining to establish BAT limitations and is reserving such limitations to be established by the permitting authority on a case-by-case basis using the permitting authority's best professional judgment.

* * * * *

(k) *Bottom ash transport water*—(1) *2020 BAT.* (i) Except for those discharges to which paragraph (k)(2) of this section applies, or when the bottom ash transport water is used in the FGD scrubber, there shall be no discharge of pollutants in bottom ash transport water. Dischargers must meet the discharge limitation in this paragraph (k)(1)(i) by a date determined by the permitting authority that is as soon as possible beginning October 13, 2021, but no later than December 31, 2025. The limitation in this paragraph (k)(1)(i) applies to the discharge of bottom ash transport water generated on and after the date determined by the permitting authority for meeting the discharge limitation, as specified in this paragraph (k)(1)(i), until the date determined by the permitting authority for meeting the effluent limitations in paragraph (k)(4) of this section. Except for those discharges to which paragraph (k)(2) of this section applies, whenever bottom ash transport water is used in any other plant process or is sent to a treatment system at the plant (except when it is used in the FGD scrubber), the resulting effluent must comply with the discharge limitation in this paragraph (k)(1)(i). When the bottom ash transport water is used in the FGD scrubber, it ceases to be bottom ash transport water, and instead is FGD wastewater, which must meet the requirements in paragraph (g) of this section.

(ii) For bottom ash transport water generated before the date determined by the permitting authority, as specified in paragraph (k)(1)(i) of this section, the EPA is declining to establish BAT limitations and is reserving such limitations to be established by the permitting authority on a case-by-case basis using the permitting authority's best professional judgment.

(2) *2020 BAT subcategories.* (i)(A) The discharge of pollutants in bottom ash transport water from a properly installed, operated, and maintained bottom ash system is authorized under the following conditions:

(*1*) To maintain system water balance when precipitation-related inflows are generated from storm events exceeding a 10-year storm event of 24-hour or longer duration (*e.g.,* 30-day storm event) and cannot be managed by installed spares, redundancies, maintenance tanks, and other secondary bottom ash system equipment; or

(*2*) To maintain system water balance when regular inflows from wastestreams other than bottom ash transport water exceed the ability of the bottom ash system to accept recycled water and segregating these other wastestreams is not feasible; or

(*3*) To maintain system water chemistry where installed equipment at the facility is unable to manage pH, corrosive substances, substances or conditions causing scaling, or fine particulates to below levels which impact system operation or maintenance; or

(*4*) To conduct maintenance not otherwise included in paragraph (k)(2)(i)(A)(*1*), (*2*), or (*3*) of this section and not exempted from the definition of transport water in § 423.11(p), and when water volumes cannot be managed by installed spares, redundancies, maintenance tanks, and other secondary bottom ash system equipment.

(B) The total volume that may be discharged for the activities in paragraph (k)(2)(i)(A) of this section shall be reduced or eliminated to the extent achievable using control measures (including best management practices) that are technologically available and economically achievable in light of best industry practice. The total volume of the discharge authorized in this paragraph (k)(2)(i)(B) shall be determined on a case-by-case basis by the permitting authority and in no event shall such discharge exceed a 30-day rolling average of ten percent of the primary active wetted bottom ash system volume. The volume of daily discharges used to calculate the 30-day rolling average shall be calculated using measurements from flow monitors.

(ii) For any electric generating unit with a total nameplate generating capacity of less than or equal to 50 megawatts, that is an oil-fired unit, or for which the owner has certified to the permitting authority that it will cease combustion of coal pursuant to § 423.19(g), the quantity of pollutants discharged in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of the applicable wastewater times the concentration for TSS listed in § 423.12(b)(4).

(A) Where a unit has certified that it will cease combustion of coal pursuant to § 423.19(g) and such unit has permanently ceased coal combustion by December 31, 2028, there shall be no



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discharge of pollutants in bottom ash transport water after April 30, 2029.

(B) Where a unit has certified that it will cease combustion of coal pursuant to § 423.19(g) and such unit has failed to permanently cease coal combustion by December 31, 2028, there shall be no discharge of pollutants in bottom ash transport water after December 31, 2028.

(iii) For bottom ash transport water generated by a low utilization electric generating unit, the quantity of pollutants discharged in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of the applicable wastewater times the concentration for TSS listed in § 423.12(b)(4), until the date determined by the permitting authority for meeting the effluent limitations in paragraph (k)(4) of this section, and shall incorporate the elements of a best management practices plan as described in paragraph (k)(3) of this section.

(3) *Best management practices plan.* Where required in paragraph (k)(2)(iii) of this section, the discharger shall prepare, implement, review, and update a best management practices plan for the recycle of bottom ash transport water, and must include:

(i) Identification of the low utilization coal-fired generating units that contribute bottom ash to the bottom ash transport system.

(ii) A description of the existing bottom ash handling system and a list of system components (*e.g.,* remote mechanical drag system, tanks, impoundments, chemical addition). Where multiple generating units share a bottom ash transport system, the plan shall specify which components are associated with low utilization generating units.

(iii) A detailed water balance, based on measurements, or estimates where measurements are not feasible, specifying the volume and frequency of water additions and removals from the bottom ash transport system, including:

(A) Water removed from the BA transport system:

(*1*) To the discharge outfall;

(*2*) To the FGD scrubber system;

(*3*) Through evaporation;

(*4*) Entrained with any removed ash; and

(*5*) To any other mechanisms not specified paragraphs (k)(3)(iii)(A)(*1*) through (*4*) of this section.

(B) Water entering or recycled to the BA transport system:

(*1*) Makeup water added to the BA transport water system.

(*2*) Bottom ash transport water recycled back to the system in lieu of makeup water.

(*3*) Any other mechanisms not specified in paragraphs (k)(3)(iii)(B)(*1*) and (*2*) of this section.

(iv) Measures to be employed by all facilities:

(A) Implementation of a comprehensive preventive maintenance program to identify, repair and replace equipment prior to failures that result in the release of bottom ash transport water.

(B) Daily or more frequent inspections of the entire bottom ash transport water system, including valves, pipe flanges and piping, to identify leaks, spills and other unintended bottom ash transport water escaping from the system, and timely repair of such conditions.

(C) Documentation of preventive and corrective maintenance performed.

(v) Evaluation of options and feasibility, accounting for the associated costs, for eliminating or minimizing discharges of bottom ash transport water, including:

(A) Segregation of bottom ash transport water from other process water.

(B) Minimization of the introduction of stormwater by diverting (*e.g.,* curbing, using covers) storm water to a segregated collection system.

(C) Recycling bottom ash transport water back to the bottom ash transport water system.

(D) Recycling bottom ash transport water for use in the FGD scrubber.

(E) Optimization of existing equipment (*e.g.,* pumps, pipes, tanks) and installing new equipment where practicable to achieve the maximum amount of recycle.

(F) Utilization of ''in-line'' treatment of transport water (*e.g.,* pH control, fines removal) where needed to facilitate recycle.

(vi) Description of the bottom ash recycle system, including all technologies, measures, and practices that will be used to minimize discharge.

(vii) A schedule showing the sequence of implementing any changes necessary to achieve the minimized discharge of bottom ash transport water, including the following:

(A) The anticipated initiation and completion dates of construction and installation associated with the technology components or process modifications specified in the plan.

(B) The anticipated dates that the discharger expects the technologies and process modifications to be fully implemented on a full-scale basis, which in no case shall be later than December 31, 2023.

(C) The anticipated change in discharge volume and effluent quality associated with implementation of the plan.

(viii) Description establishing a method for documenting and demonstrating to the permitting/control authority that the recycle system is well operated and maintained.

(ix) Performance of weekly flow monitoring for the following:

(A) Make up water to the bottom ash transport water system.

(B) Bottom ash transport water sluice flow rate (*e.g.,* to the surface impoundment(s), dewatering bins(s), tank(s), remote mechanical drag system).

(C) Bottom ash transport water discharge to surface water or publicly owned treatment works (POTW).

(D) Bottom ash transport water recycle back to the bottom ash system or FGD scrubber.

(4) *2024 BAT.* (i) Except for those discharges to which paragraphs (k)(4)(ii) through (iv) of this section applies, or when the bottom ash transport water is used in the FGD scrubber, there shall be no discharge of pollutants in bottom ash transport water. Dischargers must meet the discharge limitation in this paragraph (k)(4)(i) by a date determined by the permitting authority that is as soon as possible beginning July 8, 2024, but no later than December 31, 2029. The limitation in this paragraph (k)(4)(i) applies to the discharge of bottom ash transport water generated on and after the date determined by the permitting authority for meeting the discharge limitation, as specified in this paragraph (k)(4)(i).

(ii) For any electric generating unit with a total nameplate generating capacity of less than or equal to 50 megawatts or that is an oil-fired unit, the quantity of pollutants discharged in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of the applicable wastewater times the concentration for TSS listed in § 423.12(b)(4).

(iii) For any electric generating unit for which the owner has submitted a certification pursuant to § 423.19(h), the quantity of pollutants discharged in bottom ash transport water shall continue to be subject to limitations specified in paragraph (k)(1) or (k)(2)(i) or (iii) of this section as incorporated into the existing permit.

(A) Where such unit has permanently ceased coal combustion by December 31, 2034, there shall be no discharge of pollutants in bottom ash transport water after April 30, 2035.

(B) Where such unit has failed to permanently cease coal combustion by December 31, 2034, there shall be no discharge of pollutants in bottom ash transport water after December 31, 2034.

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(iv) For bottom ash transport water discharged from any coal combustion residual surface impoundment which commences closure pursuant to 40 CFR 257.102(e) after July 8, 2024, the quantity of pollutants in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of bottom ash transport water times the concentration listed in table 10 to this paragraph (k)(4)(iv).

TABLE 10 TO PARAGRAPH (k)(4)(iv)

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

(l) *Combustion residual leachate*—(1) *2024 BAT.* (i) Except for those discharges to which paragraph (l)(1)(i)(B) or (C) or (1)(2) of this section applies, there shall be no discharge of pollutants in combustion residual leachate.

(A) Dischargers must meet the effluent limitations for combustion residual leachate in this paragraph (l)(1)(i) by a date determined by the permitting authority that is as soon as possible beginning July 8, 2024, but no later than December 31, 2029. The effluent limitations in this paragraph (l)(1)(i) apply to the discharge of combustion residual leachate generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph (l)(1)(i).

(B) A facility which submits a request under § 423.19(n) may discharge permeate or distillate from a combustion residual leachate treatment system designed to achieve the limitations in this paragraph (l)(1)(i) for an additional period of up to one year from the date determined in paragraph (l)(1)(i)(A) of this section.

(C) After the retirement of all units at a facility, the quantity of pollutants in combustion residual leachate (CRL) shall not exceed the quantity determined by multiplying the flow of CRL permeate times the concentrations listed in the table 7 to paragraph (g)(3)(i) of this section or the flow of CRL distillate times the concentrations listed in the table following § 423.15(b)(13).

(ii) For combustion residual leachate generated before the date determined by the permitting authority, as specified in paragraph (l)(1)(i) of this section, the EPA is declining to establish BAT limitations and is reserving such limitations to be established by the permitting authority on a case-by-case basis using the permitting authority's best professional judgment.

(2) *2024 BAT subcategories.* (i) Discharges of combustion residual leachate for which the owner has submitted a certification pursuant to § 423.19(h).

(A) Where such unit has permanently ceased coal combustion by December 31, 2034, the quantity of pollutants in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration listed in table 11 to this paragraph (l)(2)(i)(A) by a date determined by the permitting authority that is as soon as possible beginning 120 days after the facility permanently ceases coal combustion, but no later than April 30, 2035.

TABLE 11 TO PARAGRAPH (l)(2)(i)(A)

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

(B) Where such unit has failed to permanently cease coal combustion by December 31, 2034, there shall be no discharge of pollutants in combustion residual leachate after December 31, 2034.

(ii) For discharges of unmanaged combustion residual leachate, the quantity of pollutants in unmanaged combustion residual leachate shall not exceed the quantity determined by multiplying the flow of unmanaged combustion residual leachate times the concentration listed in the table 11 to paragraph (l)(2)(i)(A) of this section.

(A) Dischargers must meet the effluent limitations for unmanaged combustion residual leachate in this paragraph (l)(2)(ii) by a date determined by the permitting authority that is as soon as possible beginning July 8, 2024, but no later than December 31, 2029. The effluent limitations in this paragraph (l)(2)(ii) apply to the discharge of unmanaged combustion residual leachate generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph (l)(2)(ii).

(B) Discharges of unmanaged combustion residual leachate before the date determined in paragraph (l)(2)(ii)(A) of this section.

(iii) For combustion residual leachate discharged from any coal combustion residual surface impoundment which commences closure pursuant to 40 CFR



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257.102(e) after July 8, 2024, the quantity of pollutants in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration listed in table 12 to this paragraph (l)(2)(iii).

TABLE 12 TO PARAGRAPH (l)(2)(iii)

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

* * * * *

(o) *Transfers.* (1) Transfer between applicable limitations in a permit. Where, in the permit, the permitting authority has included alternative limits subject to eligibility requirements, upon timely notification to the permitting authority under § 423.19(l), a facility can become subject to the alternative limits under the following circumstances:

(i) On or before December 31, 2023, a facility may convert:

(A) From limitations for electric generating units permanently ceasing coal combustion under paragraph (g)(2)(i) or (k)(2)(ii) of this section to limitations for low utilization electric generating units under paragraph (g)(2)(iii) or (k)(2)(iii) of this section; or

(B) From voluntary incentives program limitations under paragraph (g)(3)(i) of this section or generally applicable limitations under paragraph (k)(1)(i) of this section to limitations for low utilization electric generating units under paragraph (g)(2)(iii) or (k)(2)(iii) of this section.

(ii) On or before December 31, 2025, a facility may convert:

(A) From voluntary incentives program limitations under paragraph (g)(3)(i) of this section to limitations for electric generating units permanently ceasing coal combustion under paragraph (g)(2)(i) of this section; or

(B) From limitations for electric generating units permanently ceasing coal combustion under paragraph (g)(2)(i) or (k)(2)(ii) of this section to voluntary incentives program limitations under paragraph (g)(3)(i) of this section or generally applicable limitations under (k)(1)(i) of this section; or

(C) From limitations for low utilization electric generating units under paragraph (g)(2)(iii) or (k)(2)(iii) of this section to generally applicable limitations under paragraph (g)(1)(i) or (k)(1)(i) of this section; or

(D) From limitations for low utilization electric generating units under paragraph (g)(2)(iii) or (k)(2)(iii) of this section to voluntary incentives program limitations under paragraph (g)(3)(i) of this section or generally applicable limitations under paragraph (k)(1)(i) of this section; or

(E) From limitations for low utilization electric generating units under paragraph (g)(2)(iii) or (k)(2)(iii) of this section to limitations for electric generating units permanently ceasing coal combustion under paragraph (g)(2)(i) and (k)(2)(ii) of this section.

(2) A facility must be in compliance with all of its currently applicable requirements to be eligible to file a notice under § 423.19(l) and to become subject to a different set of applicable requirements under paragraph (o)(1) of this section.

(3) Where a facility seeking a transfer under paragraph (o)(1)(ii) of this section is currently subject to more stringent limitations than the limitations being sought, the facility must continue to meet those more stringent limitations.

* * * * *

■ 5. Amend § 423.15 by adding paragraph (c) to read as follows:

**§ 423.15 New source performance standards (NSPS).**

* * * * *

(c) *2024 NSPS for combustion residual leachate.* (1) Except as provided in paragraph (c)(2) of this section, there shall be no discharge of pollutants in combustion residual leachate (CRL). Whenever CRL is used in any other plant process or is sent to a treatment system at the plant, the resulting effluent must comply with the discharge standard in this paragraph (c).

(2) After the retirement of all units at a facility, the quantity of pollutants in CRL shall not exceed the quantity determined by multiplying the flow of CRL permeate times the concentrations listed in table 7 to § 423.13(g)(3)(i) or the flow of CRL distillate times the concentrations listed in the table in paragraph (b)(13) of this section.

* * * * *

■ 6. Amend § 423.16 by revising paragraphs (e) and (g) and adding paragraph (j) to read as follows:

**§ 423.16 Pretreatment standards for existing sources (PSES).**

* * * * *

(e) *FGD wastewater*—(1) *2020 PSES.* Except as provided for in paragraph (e)(2) of this section, for any electric generating unit with a total nameplate generating capacity of more than 50 megawatts, that is not an oil-fired unit, and that the owner has not certified that it will cease coal combustion pursuant to § 423.19(g), the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in table 3 to this paragraph (e)(1). Dischargers must meet the standards in this paragraph (e)(1) by October 13, 2023, except as provided for in paragraph (e)(2) of this section. The standards in this paragraph (e)(1) apply to the discharge of FGD wastewater generated on and after October 13, 2023.



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TABLE 3 TO PARAGRAPH (e)(1)

| Pollutant or pollutant property | PSES | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 18 | 8 |
| Mercury, total (ng/L) | 103 | 34 |
| Selenium, total (µg/L) | 70 | 29 |
| Nitrate/nitrite as N (mg/L) | 4 | 3 |

(2) *2020 PSES subcategories.* (i) For FGD wastewater discharges from a low utilization electric generating unit, the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in the table 4 to paragraph (e)(2)(ii) of this section. Dischargers must meet the standards in this paragraph (e)(2)(i) by October 13, 2023.

(ii) If any low utilization electric generating unit fails to timely recertify that the two year average capacity utilization rating of such an electric generating unit is below 10 percent per year as specified in § 423.19(f), regardless of the reason, within two years from the date such a recertification was required, the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in the table 3 to paragraph (e)(1) of this section.

TABLE 4 TO PARAGRAPH (e)(2)(ii)

| Pollutant or pollutant property | PSES | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

(3) *2024 PSES.* Except as provided for in paragraph (e)(4) of this section, for any electric generating unit with a total nameplate generating capacity of more than 50 megawatts and that is not an oil-fired unit, there shall be no discharge of pollutants in FGD wastewater. Dischargers must meet the standards in this paragraph (e)(3) by May 9, 2027, except as provided for in paragraph (e)(4) of this section. The standards in this paragraph (e)(3) apply to the discharge of FGD wastewater generated on and after May 9, 2027.

(4) *2024 PSES subcategories.* (i) For any electric generating unit for which the owner has submitted a certification pursuant to § 423.19(h), the quantity of pollutants discharged in FGD wastewater shall continue to be subject to standards specified in paragraph (e)(1) or (2) of this section as incorporated into the existing control mechanism.

(A) Where such unit has permanently ceased coal combustion by December 31, 2034, there shall be no discharge of pollutants in FGD wastewater after April 30, 2035.

(B) Where such unit has failed to permanently cease coal combustion by December 31, 2034, there shall be no discharge of pollutants in FGD wastewater after December 31, 2034.

(ii) For FGD wastewater discharged from any coal combustion residual surface impoundment which commences closure pursuant to 40 CFR 257.102(e) after July 8, 2024, the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in the table 5 to this paragraph (e)(4)(ii).

TABLE 5 TO PARAGRAPH (e)(4)(ii)

| Pollutant or pollutant property | PSES | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |



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* * * * *

(g) *Bottom ash transport water*—(1) *2020 PSES.* Except for those discharges to which paragraph (g)(2) of this section applies, or when the bottom ash transport water is used in the FGD scrubber, for any electric generating unit with a total nameplate generating capacity of more than 50 megawatts, that is not an oil-fired unit, that is not a low utilization electric generating unit, and that the owner has not certified that the electric generating unit will cease coal combustion pursuant to § 423.19(g), there shall be no discharge of pollutants in bottom ash transport water. The standard in this paragraph (g)(1) applies to the discharge of bottom ash transport water generated on and after October 13, 2023. Except for those discharges to which paragraph (g)(2) of this section applies, whenever bottom ash transport water is used in any other plant process or is sent to a treatment system at the plant (except when it is used in the FGD scrubber), the resulting effluent must comply with the discharge standard in this paragraph (g)(1). When the bottom ash transport water is used in the FGD scrubber, the quantity of pollutants in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of bottom ash transport water times the concentration listed in table 3 to paragraph (e)(1) of this section.

(2) *2020 PSES subcategories.* (i) The discharge of pollutants in bottom ash transport water from a properly installed, operated, and maintained bottom ash system is authorized under the following conditions:

(A) To maintain system water balance when precipitation-related inflows are generated from a 10-year storm event of 24-hour or longer duration (*e.g.,* 30-day storm event) and cannot be managed by installed spares, redundancies, maintenance tanks, and other secondary bottom ash system equipment; or

(B) To maintain system water balance when regular inflows from wastestreams other than bottom ash transport water exceed the ability of the bottom ash system to accept recycled water and segregating these other wastestreams is feasible; or

(C) To maintain system water chemistry where current operations at the facility are unable to currently manage pH, corrosive substances, substances or conditions causing scaling, or fine particulates to below levels which impact system operation or maintenance; or

(D) To conduct maintenance not otherwise included in paragraphs (g)(2)(i)(A), (B), or (C) of this section and not exempted from the definition of transport water in § 423.11(p), and when water volumes cannot be managed by installed spares, redundancies, maintenance tanks, and other secondary bottom ash system equipment.

(ii) The total volume that may be discharged to a POTW for the activities in paragraphs (g)(2)(i)(A) through (D) of this section shall be reduced or eliminated to the extent achievable as determined by the control authority. The control authority may also include control measures (including best management practices) that are technologically available and economically achievable in light of best industry practice. In no event shall the total volume of the discharge exceed a 30-day rolling average of ten percent of the primary active wetted bottom ash system volume. The volume of daily discharges used to calculate the 30-day rolling average shall be calculated using measurements from flow monitors.

(iii) For bottom ash transport water generated by a low utilization electric generating unit, the quantity of pollutants discharged in bottom ash transport water shall incorporate the elements of a best management practices plan as described in § 423.13(k)(3).

(3) *2024 PSES.* Except for those discharges to which paragraph (g)(4) of this section applies, for any electric generating unit with a total nameplate generating capacity of more than 50 megawatts, that is not an oil-fired unit, there shall be no discharge of pollutants in bottom ash transport water. The standard in this paragraph (g)(3) applies to the discharge of bottom ash transport water generated on and after May 9, 2027. Except for those discharges to which paragraph (g)(4) of this section applies, whenever bottom ash transport water is used in any other plant process or is sent to a treatment system at the plant, the resulting effluent must comply with the discharge standard in this paragraph (g)(3).

(4) *2024 PSES subcategories.* (i) For any electric generating unit for which the owner has submitted a certification pursuant to § 423.19(h), the quantity of pollutants discharged in bottom ash transport water shall continue to be subject to standards specified in paragraph (g)(1) or (2) as incorporated into the existing control mechanism.

(A) Where such unit has permanently ceased coal combustion by December 31, 2034, there shall be no discharge of pollutants in bottom ash transport water after April 30, 2035.

(B) Where such unit has failed to permanently cease coal combustion by December 31, 2034, there shall be no discharge of pollutants in bottom ash transport water after December 31, 2034.

(ii) For bottom ash transport water discharged from any coal combustion residual surface impoundment which commences closure pursuant to 40 CFR 257.102(e) after July 8, 2024, the quantity of pollutants in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of bottom ash transport water times the concentration listed in table 6 to this paragraph (g)(4)(ii).

TABLE 6 TO PARAGRAPH (g)(4)(ii)

| Pollutant or pollutant property | PSES | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

* * * * *

(j) *Combustion residual leachate*—(1) *2024 PSES.* (i) Except for those discharges to which paragraph (j)(2) or (j)(1)(ii) of this section applies, there shall be no discharge of pollutants in combustion residual leachate. The standard in this paragraph (j)(1)(i) applies to the discharge of combustion residual leachate generated on and after May 9, 2027. Except for those discharges to which paragraph (j)(2) of this section

applies, whenever combustion residual leachate is used in any other plant process or is sent to a treatment system at the plant, the resulting effluent must comply with the discharge standard in this paragraph (j)(1)(i).

(ii) After the retirement of all units at a facility, the quantity of pollutants in CRL shall not exceed the quantity determined by multiplying the flow of CRL permeate times the concentrations listed in the table 7 to § 423.13(g)(3)(i) or the flow of CRL distillate times the concentrations listed in the table in § 423.15(b)(13).

(2) *2024 PSES subcategories.* (i) Except as described in paragraph (j)(2)(i)(A) of this section, the EPA is declining to establish PSES for electric generating units for which the owner has submitted a certification pursuant to § 423.19(h) and is reserving such standards to be established by the control authority on a case-by-case.

(A) Where such unit has permanently ceased coal combustion by December 31, 2034, the quantity of pollutants in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration listed in the table 7 to this paragraph (j)(2)(i)(A) no later than April 30, 2035.

TABLE 7 TO PARAGRAPH (j)(2)(i)(A)

| Pollutant or pollutant property | PSES | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (μg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

(B) Where such unit has failed to permanently cease coal combustion by December 31, 2034, there shall be no discharge of pollutants in FGD wastewater after December 31, 2034.

(ii) For combustion residual leachate discharged from any coal combustion residual surface impoundment which commences closure pursuant to 40 CFR 257.102(e) after July 8, 2024, the quantity of pollutants in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration listed in table 8 to this paragraph (j)(2)(ii).

TABLE 8 TO PARAGRAPH (j)(2)(ii)

| Pollutant or pollutant property | PSES | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (μg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

■ 7. Amend § 423.17 by adding paragraph (c) to read as follows:

**§ 423.17 Pretreatment standards for new sources (PSNS).**

* * * * *

(c) *2024 PSNS for combustion residual leachate.* (1) Except as provided in paragraph (c)(2) of this section, there shall be no discharge of pollutants in combustion residual leachate (CRL). Whenever CRL is used in any other plant process or is sent to a treatment system at the plant, the resulting effluent must comply with the discharge standard in this paragraph (c)(1).

(2) After the retirement of all units at a facility, the quantity of pollutants in CRL shall not exceed the quantity determined by multiplying the flow of CRL permeate times the concentrations listed in table 7 to § 423.13(g)(3)(i) or the flow of CRL distillate times the concentrations listed in the table in § 423.15(b)(13).

■ 8. Revise § 423.18 to read as follows:

**§ 423.18 Permit conditions.**

All permits subject to this part shall include the following permit conditions:

(a) An electric generating unit shall qualify as a low utilization electric generating unit, permanently ceasing the combustion of coal by December 31, 2028, or permanently ceasing the combustion of coal by December 31, 2034, if such qualification would have been demonstrated absent the following qualifying event:

(1) An emergency order issued by the Department of Energy under section 202(c) of the Federal Power Act;

(2) A reliability must run agreement issued by a Public Utility Commission; or

(3) Any other reliability-related order, energy emergency alert, or agreement issued by a competent electricity regulator (*e.g.,* an independent system operator) which results in that electric generating unit operating in a way not contemplated when the certification was made; or

(4) The operation of the electric generating unit was necessary for load balancing in an area subject to a declaration under 42 U.S.C. 5121 *et seq.,* that there exists:

(i) An ''Emergency''; or

(ii) A ''Major Disaster''; and

(iii) That load balancing was due to the event that caused the ''Emergency'' or ''Major Disaster'' in paragraphs



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(a)(4)(i) and (ii) of this section to be declared.

(b) Any facility providing the required documentation pursuant to § 423.19(i) may avail itself of the protections of the permit condition in paragraph (a) of this section.

(c) A facility discharging permeate or distillate from an FGD wastewater or combustion residual leachate treatment system and satisfying § 423.19(n) shall be deemed to meet the following requirements:

(1) The FGD wastewater requirements of § 423.13(g)(4) for up to one year after the date determined pursuant to § 423.11(t); and

(2) The combustion residual leachate requirements of § 423.13(l)(1) for up to one year after the date determined pursuant to § 423.11(t).

■ 9. Revise and republish § 423.19 to read as follows:

**§ 423.19 Reporting and recordkeeping requirements.**

(a) *In general.* Discharges subject to this part must comply with the reporting requirements in this section.

(b) *Signature and certification.* Unless otherwise provided in this section, all certifications and recertifications required in this part must be signed and certified pursuant to 40 CFR 122.22 for direct dischargers or 40 CFR 403.12(l) for indirect dischargers.

(c) *Publicly accessible internet site requirements.* (1) Except as provided in paragraph (c)(2) of this section, each facility subject to one or more of the reporting requirements in paragraphs (d) through (o) of this section must maintain a publicly accessible internet site (ELG website) containing the information specified in paragraphs (d) through (o), if applicable. This website shall be titled ''ELG Rule Compliance Data and Information.'' The facility must ensure that all information required to be posted is immediately available to anyone visiting the site, without requiring any prerequisite, such as registration or a requirement to submit a document request. All required information must be clearly identifiable and must be able to be immediately downloaded by anyone accessing the site in a format that enables additional analysis (*e.g.,* comma-separated values text file format). When the facility initially creates, or later changes, the web address (*i.e.,* Uniform Resource Locator (URL)) at any point, they must notify EPA via the ''contact us'' form on EPA's Effluent Guidelines website and the permitting authority or control authority within 14 days of creating the website or making the change. The facility's ELG website must also have a ''contact us'' form or a specific email address posted on the website for the public to use to submit questions and issues relating to the availability of information on the website.

(2)(i) When an owner or operator subject to this section already maintains a ''CCR Rule Compliance Data and Information'' website pursuant to 40 CFR 257.107, the postings required under this section may be made to the existing ''CCR Rule Compliance Data and Information'' website and shall be delineated under a separate heading that shall state ''ELG Rule Compliance Data and Information.'' When electing to use an existing website pursuant to this paragraph (c)(2), the facility shall notify EPA via the ''contact us'' form on EPA's Effluent Guidelines website and the permitting authority or control authority no later than July 8, 2024, or upon first becoming subject to paragraphs (d) through (o) of this section, whichever is later.

(ii) When the same owner or operator is subject to the provisions of this part for multiple facilities, the owner or operator may comply with the requirements of this section by using the same internet site for multiple facilities provided the ELG website clearly delineates information by the name of each facility.

(3) Unless otherwise required in this section, the information required to be posted to the ELG website must be made available to the public for at least 10 years following the date on which the information was first posted to the ELG website, or the length of the permit plus five years, whichever is longer. All required information must be clearly identifiable and must be able to be immediately downloaded by anyone accessing the site in a format that enables additional analysis (*e.g.,* comma-separated values text file format).

(4) Unless otherwise required in this section, the information must be posted to the ELG website:

(i) Within 30 days of submitting the information to the permitting authority or control authority; or

(ii) Where information was submitted to the permitting authority or control authority prior to July 8, 2024, by July 8, 2024.

(d) *Requirements for facilities discharging bottom ash transport water under this part*—(1) *Certification statement.* For sources seeking to discharge bottom ash transport water pursuant to § 423.13(k)(2)(i) or (g)(2)(i), an initial certification shall be submitted to the permitting authority by the as soon as possible date determined under § 423.11(t), or the control authority by October 13, 2023, in the case of an indirect discharger.

(2) *Signature and certification.* The certification statement must be signed and certified by a professional engineer.

(3) *Contents.* An initial certification shall include the following:

(i) A statement that the professional engineer is a licensed professional engineer.

(ii) A statement that the professional engineer is familiar with the requirements in this part.

(iii) A statement that the professional engineer is familiar with the facility.

(iv) The primary active wetted bottom ash system volume in § 423.11(aa).

(v) Material assumptions, information, and calculations used by the certifying professional engineer to determine the primary active wetted bottom ash system volume.

(vi) A list of all potential discharges under § 423.13(k)(2)(i)(A)(*1*) through (*4*) or § 423.16(g)(2)(i)(A) through (D), the expected volume of each discharge, and the expected frequency of each discharge.

(vii) Material assumptions, information, and calculations used by the certifying professional engineer to determine the expected volume and frequency of each discharge including a narrative discussion of why such water cannot be managed within the system and must be discharged.

(viii) A list of all wastewater treatment systems at the facility currently, or otherwise required by a date certain under this section.

(ix) A narrative discussion of each treatment system including the system type, design capacity, and current or expected operation.

(e) *Requirements for a bottom ash best management practices plan*—(1) *Initial and annual certification statement.* For sources required to develop and implement a best management practices plan pursuant to § 423.13(k)(3), an initial certification shall be made to the permitting authority with a permit application or within two years of October 13, 2021, whichever is later, or to the control authority no later than October 13, 2023, in the case of an indirect discharger, and an annual recertification shall be made to the permitting authority, or control authority in the case of an indirect discharger, within 60 days of the anniversary of the original plan.

(2) *Signature and certification.* The certification statement must be signed and certified by a professional engineer.

(3) *Contents for initial certification.* An initial certification shall include the following:



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(i) A statement that the professional engineer is a licensed professional engineer.

(ii) A statement that the professional engineer is familiar with the requirements in this part.

(iii) A statement that the professional engineer is familiar with the facility.

(iv) The best management practices plan.

(v) A statement that the best management practices plan is being implemented.

(4) *Additional contents for annual certification.* In addition to the required contents of the initial certification in paragraph (e)(3) of this section an annual certification shall include the following:

(i) Any updates to the best management practices plan.

(ii) An attachment of weekly flow measurements from the previous year.

(iii) The average amount of recycled bottom ash transport water in gallons per day.

(iv) Copies of inspection reports and a summary of preventative maintenance performed on the system.

(v) A statement that the plan and corresponding flow records are being maintained at the office of the plant.

(f) *Requirements for low utilization electric generating units*—(1) *Notice of Planned Participation.* For sources seeking to qualify as a low utilization electric generating units, a Notice of Planned Participation shall be submitted to the permitting authority or control authority no later than October 13, 2021.

(2) *Contents.* A Notice of Planned Participation shall identify the potential low utilization electric generating unit. The notice shall also include a statement of at least two years' capacity utilization rating data for the most recent two years of operation of each low utilization electric generating unit and a statement that the facility has a good faith belief that each low utilization electric generating unit will continue to operate at the required capacity utilization rating. Where the most recent capacity utilization rating does not meet the low utilization electric generating unit requirement, a discussion of the projected future utilization shall be provided, including material data and assumptions used to make that projection.

(3) *Initial and annual certification statement.* For sources seeking to qualify as a low utilization electric generating unit under this part, an initial certification shall be made to the permitting authority, or to the control authority in the case of an indirect discharger, no later than December 31, 2023, and an annual recertification shall be made to the permitting authority, or control authority in the case of an indirect discharger, within 60 days of submitting annual electricity production data to the Energy Information Administration.

(4) *Contents.* A certification or annual recertification shall be based on the information submitted to the Energy Information Administration and shall include copies of the underlying forms submitted to the Energy Information Administration, as well as any supplemental information and calculations used to determine the two year average annual capacity utilization rating.

(g) *Requirements for units that will achieve permanent cessation of coal combustion by December 31, 2028*—(1) *Notice of Planned Participation.* For sources seeking to qualify as an electric generating unit that will achieve permanent cessation of coal combustion by December 31, 2028, under this part, a Notice of Planned Participation shall be made to the permitting authority, or to the control authority in the case of an indirect discharger, no later than June 27, 2023.

(2) *Contents.* A Notice of Planned Participation shall identify the electric generating units intended to achieve the permanent cessation of coal combustion. A Notice of Planned Participation shall include the expected date that each electric generating unit is projected to achieve permanent cessation of coal combustion, whether each date represents a retirement or a fuel conversion, whether each retirement or fuel conversion has been approved by a regulatory body, and what the relevant regulatory body is. The Notice of Planned Participation shall also include a copy of the most recent integrated resource plan for which the applicable state agency approved the retirement or repowering of the unit subject to the ELGs, certification of electric generating unit cessation under 40 CFR 257.103(b), or other documentation supporting that the electric generating unit will permanently cease the combustion of coal by December 31, 2028. The Notice of Planned Participation shall also include, for each such electric generating unit, a timeline to achieve the permanent cessation of coal combustion. Each timeline shall include interim milestones and the projected dates of completion.

(3) *Annual progress report.* Annually after submission of the Notice of Planned Participation in paragraph (g)(1) of this section, a progress report shall be filed with the permitting authority, or control authority in the case of an indirect discharger.

(4) *Contents.* An annual progress report shall detail the completion of any interim milestones listed in the Notice of Planned Participation since the previous progress report, provide a narrative discussion of any completed, missed, or delayed milestones, and provide updated milestones. An annual progress report shall also include one of the following:

(i) A copy of the official suspension filing (or equivalent filing) made to the facility's reliability authority detailing the conversion to a fuel source other than coal;

(ii) A copy of the official retirement filing (or equivalent filing) made to the facility's reliability authority which must include a waiver of recission rights; or

(iii) An initial certification, or recertification for subsequent annual progress reports, containing either a statement that the facility will make the filing required in paragraph (g)(4)(i) of this section or a statement that the facility will make the filing required in paragraph (g)(4)(ii) of this section. The certification or recertification must include the estimated date that such a filing will be made.

(iv) A facility shall not include a certification or recertification under paragraph (g)(4)(iii) of this section in the final annual progress report submitted prior to permanent cessation of coal combustion. Rather, this final annual progress report must include the filing under paragraph (g)(4)(i) or (ii) of this section.

(h) *Requirements for units that will achieve permanent cessation of coal combustion by December 31, 2034*—(1) *Notice of Planned Participation.* For sources seeking to qualify as an electric generating unit that will achieve permanent cessation of coal combustion by December 31, 2034, under this part, a Notice of Planned Participation shall be made to the permitting authority, or to the control authority in the case of an indirect discharger, no later than December 31, 2025.

(2) *Contents.* A Notice of Planned Participation shall identify the electric generating units intended to achieve the permanent cessation of coal combustion. A Notice of Planned Participation shall include the expected date that each electric generating unit is projected to achieve permanent cessation of coal combustion, whether each date represents a retirement or a fuel conversion, whether each retirement or fuel conversion has been approved by a regulatory body, and what the relevant regulatory body is.

The Notice of Planned Participation shall also include a copy of the most recent integrated resource plan for which the applicable state agency approved the retirement or repowering of the unit subject to the ELGs, or other documentation supporting that the electric generating unit will permanently cease the combustion of coal by December 31, 2034. The Notice of Planned Participation shall also include, for each such electric generating unit, a timeline to achieve the permanent cessation of coal combustion. Each timeline shall include interim milestones and the projected dates of completion. Finally, the Notice of Planned Participation shall also include, for each such electric generating unit, a certification statement that the facility is in compliance with the following limitations or standards:

(i) The applicable limitations or standards for FGD wastewater in § 423.13(g)(1) or (g)(2)(ii) or (iii) or § 423.16(e)(1) or (2); and

(ii) The applicable limitations or standards for bottom ash transport water in § 423.13(k)(1) or (k)(2)(i) or (iii) or § 423.16(g)(1) or (2).

(3) *Annual progress report.* Annually after submission of the Notice of Planned Participation in paragraph (h)(1) of this section, a progress report shall be filed with the permitting authority, or control authority in the case of an indirect discharger.

(4) *Contents.* An annual progress report shall detail the completion of any interim milestones listed in the Notice of Planned Participation since the previous progress report, provide a narrative discussion of any completed, missed, or delayed milestones, and provide updated milestones. An annual progress report shall also include one of the following:

(i) A copy of the official suspension filing (or equivalent filing) made to the facility's reliability authority detailing the conversion to a fuel source other than coal;

(ii) A copy of the official retirement filing (or equivalent filing) made to the facility's reliability authority which must include a waiver of recission rights; or

(iii) An initial certification, or recertification for subsequent annual progress reports, containing either a statement that the facility will make the filing required in paragraph (h)(4)(i) of this section or a statement that the facility will make the filing required in paragraph (h)(4)(ii) of this section. The certification or recertification must include the estimated date that such a filing will be made.

(iv) A facility shall not include a certification or recertification under paragraph (h)(4)(iii) of this section in the final annual progress report submitted prior to permanent cessation of coal combustion. Rather, this final annual progress report must include the filing under paragraph (h)(4)(i) or (ii) of this section.

(i) *Requirements for facilities seeking protections under this part*—(1) *Certification statement.* For sources seeking to apply the protections of the permit conditions in § 423.18(a), and for each instance that § 423.18(a) is applied, a one-time certification shall be submitted to the permitting authority, or control authority in the case of an indirect discharger, no later than:

(i) In the case of an order or agreement under § 423.18(a)(1), 30 days from receipt of the order or agreement attached pursuant to paragraph (i)(2)(ii) of this section; or

(ii) In the case of an ''Emergency'' or ''Major Disaster'' under § 423.18(a)(2), 30 days from the date that a load balancing need arose.

(2) *Contents.* A certification statement must include the following:

(i) The qualifying event from the list in § 423.18(a), the individual or entity that issued or triggered the event, and the date that such an event was issued or triggered.

(ii) A copy of any documentation of the qualifying event from the individual or entity listed under paragraph (i)(2)(i) of this section, or, where such documentation does not exist, other documentation with indicia of reliability for the permitting authority to confirm the qualifying event.

(iii) An analysis and accompanying narrative discussion which demonstrates that an electric generating unit would have qualified for the subcategory at issue absent the event detailed in paragraph (i)(2)(i) of this section, including the material data, assumptions, and methods used.

(3) *Termination of need statement.* For sources filing a certification statement under paragraph (i)(1) of this section, and for each such certification statement, a one-time termination of need statement shall be submitted to the permitting authority, or control authority in the case of an indirect discharger, no later than 30 days from when the source is no longer subject to increased production from the qualifying event.

(4) *Contents.* A termination of need statement must include a narrative discussion including the date the qualifying event terminated, or if it has not terminated, why the source believes the capacity utilization will no longer be elevated to a level requiring the protection of § 423.18.

(j) *Requirements for facilities voluntarily meeting limits in this part*—(1) *Notice of Planned Participation.* For sources opting to comply with the Voluntary Incentives Program requirements of § 423.13(g)(3)(i) by December 31, 2028, a Notice of Planned Participation shall be made to the permitting authority no later than October 13, 2021.

(2) *Contents.* A Notice of Planned Participation shall identify the facility opting to comply with the Voluntary Incentives Program requirements of § 423.13(g)(3)(i), specify what technology or technologies are projected to be used to comply with those requirements, and provide a detailed engineering dependency chart and accompanying narrative demonstrating when and how the system(s) and any accompanying disposal requirements will be achieved by December 31, 2028.

(3) *Annual progress report.* After submission of the Notice of Planned Participation in paragraph (j)(1) of this section, a progress report shall be filed with the permitting authority, or control authority in the case of an indirect discharger.

(4) *Contents.* An annual progress report shall detail the completion of interim milestones presented in the engineering dependency chart from the Notice of Planned Participation since the previous progress report, provide a narrative discussion of completed, missed, or delayed milestones, and provide updated milestones.

(5) *Rollover certification.* Where, prior to October 13, 2020, a discharger has already provided a notice to the permitting authority of opting to comply with the Voluntary Incentives Program requirements of § 423.13(g)(3)(i), such notice will satisfy paragraph (j)(1) of this section. However, where details required by paragraph (j)(2) of this section were missing from the previously provided notice, those details must be provided in the first annual progress report, no later than October 13, 2021.

(k) *Requirements for facilities with discharges of unmanaged combustion residual leachate*—(1) *Annual combustion residual leachate monitoring report.* In addition to reporting pursuant to 40 CFR part 127, each facility with discharges of unmanaged combustion residual leachate meeting the definition in § 423.11(ff)(1) shall file an annual combustion residual leachate monitoring report each calendar year to the permitting authority.

(2) *Contents.* The annual combustion residual leachate monitoring report shall provide the following monitoring data for each pollutant listed in table 1 to paragraph (k)(2)(v) of this section. For paragraphs (k)(2)(ii) and (iii) of this section the report shall also describe the location of monitoring wells, screening depth, and frequency of sampling. The report shall include summary statistics including monthly minimum, maximum, and average concentrations for each pollutant. The report shall be supported by an appendix of all samples.

(i) A list of coal combustion residual landfills and surface impoundments which the permitting authority has determined are point sources with functional equivalent direct discharges.

(ii) Groundwater monitoring data as the combustion residual leachate leaves each of the landfills or surface impoundment listed in paragraph (k)(2)(i) of this section.

(iii) Groundwater monitoring at the point the combustion residual leachate enters a surface waterbody.

(iv) Effluent monitoring data reported pursuant to 40 CFR part 127.

(v) Summary statistics for the data described in paragraphs (k)(2)(ii) through (iv) of this section including the monthly average and daily maximum of each pollutant in the table 1 to this paragraph (k)(2)(v) and a comparison to any limitation in § 423.13(l)(2)(ii).

TABLE 1 TO PARAGRAPH (k)(2)(v)

| BAT Treated Pollutants in Combustion Residual Leachate | |
|---|---|
| Antimony | Magnesium |
| Arsenic | Manganese |
| Barium | Mercury |
| Beryllium | Molybdenum |
| Cadmium | Nickel |
| Chromium | Thallium |
| Cobalt | Titanium |
| Copper | Vanadium |
| Lead | Zinc |

(l) *Requirements for facilities seeking to transfer between applicable limitations in a permit under this part*—(1) *Notice of Planned Participation.* For sources which have filed a Notice of Planned Participation under paragraph (f)(1), (g)(1), or (j)(1) of this section and intend to make changes that would qualify them for a different set of requirements under § 423.13(o), a Notice of Planned Participation shall be made to the permitting authority, or to the control authority in the case of an indirect discharger, no later than the dates stated in § 423.13(o)(1).

(2) *Contents.* A Notice of Planned Participation shall include a list of the electric generating units for which the source intends to change compliance alternatives. For each such electric generating unit, the notice shall list the specific provision under which this transfer will occur, the reason such a transfer is warranted, and a narrative discussion demonstrating that each electric generating unit will be able to maintain compliance with the relevant provisions.

(m) *Notice of material delay*—(1) *Notice.* Within 30 days of experiencing a material delay in the milestones set forth in paragraph (g)(2), (h)(2), or (j)(2) of this section and where such a delay may preclude permanent cessation of coal combustion or compliance with the voluntary incentives program limitations by December 31, 2028, a facility shall file a notice of material delay with the permitting authority, or control authority in the case of an indirect discharger.

(2) *Contents.* The contents of such a notice shall include the reason for the delay, the projected length of the delay, and a proposed resolution to maintain compliance.

(n) *Requirements for facilities seeking a one-year flexibility to discharge permeate or distillate from an FGD wastewater or combustion residual leachate treatment system designed to achieve limitations in this part*—(1) *Initial request letter.* When filing a permit application or permit modification request, a facility seeking to discharge permeate or distillate during the first year of operations after the date determined in § 423.13(g)(4)(i)(A) or (l)(1)(i)(A) shall include a letter requesting this flexibility from the permitting authority. The initial request letter shall detail the expected type, frequency, duration, and necessity of discharge. The initial request letter shall also state that this period of discharge was not included for consideration in establishing the applicability timing under § 423.11(t)(3).

(2) *Discharge monitoring and reporting.* Upon inclusion in the permit of the flexibility to discharge the permeate or distillate as requested in paragraph (n)(1) of this section, the permitting authority shall also extend any existing monitoring and reporting requirements (*e.g.,* arsenic monitoring).

(o) *Certification for wastewater generated by a 10-year, 24-hour or longer duration storm event*—(1) *Storm Event Discharge Certification Statement.* For sources seeking to discharge low volume wastewater which would otherwise be considered FGD wastewater, bottom ash transport water, or combustion residual leachate but for a storm event exceeding a 10-year, 24-hour or longer duration storm event, a Storm Event Discharge Certification Statement shall be submitted to the permitting authority, or control authority in the case of an indirect discharger, no later than five business days from the last discharge.

(2) *Signature and certification.* The certification statement must be signed and certified by a professional engineer.

(3) *Contents.* A Storm Event Discharge Certification shall include the following:

(i) A statement that the professional engineer is a licensed professional engineer.

(ii) A statement that the professional engineer is familiar with the requirements in this part.

(iii) A statement that the professional engineer is familiar with the facility.

(iv) A statement that the facility experienced a storm event exceeding a 10-year, 24-hour or longer duration, including specifics of the actual storm event that are sufficient for a third party to verify the accuracy of the statement.

(v) A statement that a discharge of low volume wastewater that would otherwise meet the definition of FGD wastewater, bottom ash transport water, or combustion residual leachate was necessary, including a list of the best management practices at the site and a narrative discussion of the ability of on-site equipment and practices to manage the wastewater.

(vi) The duration and volume of any such discharge.

(vii) A statement that the discharge does not otherwise violate any other limitation or permit condition.

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**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Part 423**

**[EPA–HQ–OW–2009–0819; FRL–8794–01–OW]**

**RIN 2040–AG23**

## Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Proposed rule; notification of public hearing.

**SUMMARY:** The Environmental Protection Agency (EPA or the Agency) is proposing a regulation to revise the technology-based effluent limitations guidelines and standards (ELGs) for the steam electric power generating point source category applicable to flue gas desulfurization (FGD) wastewater, bottom ash (BA) transport water, and combustion residual leachate (CRL) at existing sources. EPA is also soliciting comment on ELGs for legacy wastewater. This proposal is estimated to cost $200 million dollars annually in social costs and reduce pollutant discharges by approximately 584 million pounds per year.

**DATES:**

*Comments:* Comments on this proposal must be received on or before May 30, 2023. Comments intended for the associated direct final rule published elsewhere in this issue of the **Federal Register**, *Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category—Initial Notification Date Extension,* must be received on or before April 28, 2023.

*Public hearing:* EPA will conduct two online public hearings about this proposed rule on April 20, 2023, and April 25, 2023. After a brief presentation by EPA personnel, the Agency will accept oral comments that will be limited to three (3) minutes per commenter. The hearing will be recorded and transcribed, and EPA will consider all the oral comments provided, along with the written public comments submitted via the docket for this rulemaking. To register for the hearing, please visit EPA's website at *www.epa.gov/eg/steam-electric-power-generating-effluent-guidelines-2023-proposed-rule.*

**ADDRESSES:** Submit your comments, identified by Docket ID No. EPA–HQ–OW–2009–0819 at *www.regulations.gov.* Follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from *www.regulations.gov.* EPA may publish any comment received to its public docket. Do not electronically submit any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (*e.g.,* audio, video) must be accompanied by a written comment. The written comment is considered the official comment and should include all points you wish to make. EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.,* on the web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI and multimedia submissions, and general guidance on making effective comments, please visit *www.epa.gov/dockets/commenting-epa-dockets.* All documents in the docket are listed on the *www.regulations.gov* website. Although listed in the index, some information is not publicly available, such as CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy form. Electronically available docket materials are available through *www.regulations.gov.*

**FOR FURTHER INFORMATION CONTACT:** For technical information, contact Richard Benware, Engineering and Analysis Division, telephone: 202–566–1369; email: *benware.richard@epa.gov.* For economic information, contact James Covington, Water Economics Center, telephone: 202–566–1034; email: *covington.james@epa.gov.*

**SUPPLEMENTARY INFORMATION:**

*Preamble Acronyms and Abbreviations.* EPA uses multiple acronyms and terms in this preamble. While this list may not be exhaustive, to ease the reading of this preamble and for reference purposes, EPA defines terms and acronyms used in Appendix A of this preamble.

*Supporting Documentation.* The proposed rule is supported by a number of documents, including:

- Technical Development Document for Proposed Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (TDD), Document No. 821R23005. This report summarizes the technical and engineering analyses supporting the proposed rule. The TDD presents EPA's updated analyses supporting the proposed revisions to FGD wastewater, BA transport water, CRL, and legacy wastewater. The TDD includes additional data that has been collected since the publication of the 2015 and 2020 rules, updates to the industry (*e.g.,* retirements, updates to wastewater handling), cost methodologies, pollutant removal estimates, corresponding non-water quality environmental impacts associated with updated FGD and BA methodologies, and calculation of the proposed effluent limitations. In addition to the TDD, the Technical Development Document for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (2015 TDD, Document No. EPA–821–R–15–007) and the Supplemental Technical Development Document for Revisions to the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (2020 Supplemental TDD, Document No. EPA–821–R–20–001) provide a more complete summary of EPA's data collection, description of the industry, and underlying analyses supporting the 2015 and 2020 rules.
- Supplemental Environmental Assessment for Proposed Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (EA), Document No. 821R23004. This report summarizes the potential environmental and human health impacts estimated to result from implementation of the proposed revisions to the 2015 and 2020 rules.
- Benefit and Cost Analysis for Proposed Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (BCA Report), Document No. 821R23003. This report summarizes the societal benefits and costs estimated to result from implementation of the proposed revisions to the 2015 and 2020 rules.
- Regulatory Impact Analysis for Proposed Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (RIA), Document No. 821R23002. This report presents a profile of the steam electric power generating industry, a summary of estimated costs and impacts associated with the proposed revisions to the 2015 and 2020 rules, and an assessment of the potential impacts on employment and small businesses.
- Environmental Justice Analysis for Proposed Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating

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Point Source Category (EJA), Document No. 821R23001. This report presents a profile of the communities and populations potentially impacted by this proposal, analysis of the distribution of impacts in the baseline and proposed changes, and a summary of inputs from potentially impacted communities that EPA met with prior to the proposal.

- Docket Index for the Proposed Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category. This document provides a list of the additional memoranda, references, and other information EPA relied on for the proposed revisions to the ELGs.

*Organization of this Document.* The information in this preamble is organized as follows:


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## I. Executive Summary

### *A. Purpose of Rule*

EPA is proposing new regulations that apply to wastewater discharges from steam electric power plants, particularly coal-fired power plants. These plants are increasingly aging and uncompetitive sources of electric power in many portions of the United States and are subject to several environmental regulations designed to control (and in some cases eliminate) air, water, and land pollution over time. One of these regulations, the Steam Electric Power Generating Effluent Limitations Guidelines—or steam electric ELGs—was promulgated in 2015 (80 FR 67838; November 3, 2015) and revised in 2020 (85 FR 64650; October 13, 2020). The 2015 and 2020 rules apply to the subset of the electric power industry where ''generation of electricity is the predominant source of revenue or principal reason for operation, and whose generation of electricity results primarily from a process utilizing fossil-type fuel (coal, oil, gas), fuel derived from fossil fuel (*e.g.,* petroleum coke, synthesis gas), or nuclear fuel in conjunction with a thermal cycle employing the steam-water system as the thermodynamic medium'' (40 CFR 423.10). The 2015 rule addressed discharges from FGD wastewater, fly ash (FA) transport water, BA transport water, flue gas mercury control (FGMC) wastewater, gasification wastewater, CRL, legacy wastewater, and nonchemical metal cleaning wastes. The 2020 rule modified the 2015 requirements for FGD wastewater and BA transport water for existing sources only. The 2015 limitations for CRL from existing sources and legacy wastewater were vacated by the United States (U.S.) Court of Appeals for the Fifth Circuit in *Southwestern Electric Power Co., et al.* v. *EPA,* 920 F.3d 999 (5th Cir. 2019).

In the years since EPA revised the steam electric ELGs in 2015 and 2020, pilot testing and full-scale use of various, more stringent compliance technologies have continued to expand. This proposal, if finalized, would revise requirements for discharges associated with the two wastestreams addressed in the 2020 rule: BA transport water and FGD wastewater at existing sources. The proposal would also address the 2015 rule CRL requirements that were vacated. Finally, while EPA is proposing technology-based limitations determined by permitting authorities on a site-specific basis using their best professional judgment (BPJ), an option discussed by the Court in *Southwestern Electric Power Co.* v. *EPA.*

### *B. Summary of Proposed Rule*

For existing sources that discharge directly to surface water, with the exception of the subcategories discussed below, the proposed rule would establish the following effluent limitations based on Best Available Technology Economically Achievable (BAT):

- A zero-discharge limitation for all pollutants in FGD wastewater and BA transport water.
- Numeric (non-zero) discharge limitations for mercury and arsenic in CRL.

The proposed rule would eliminate the separate, less stringent BAT requirements for two subcategories: high flow facilities and low utilization electric generating units (LUEGUs). The proposed rule does not seek to change the existing subcategories for oil-fired EGUs and small generating units (50 MW or less) established in the 2015 rule. The proposed rule also does not seek to change the existing subcategory for electric generating units (EGUs) permanently ceasing the combustion of coal by 2028, which was established in the 2020 rule (although the Agency does solicit comment on possible changes to this subcategory). Finally, the proposed rule would create separate requirements for a new subcategory of facilities that have already complied with either the 2015 or 2020 rule's requirements (hereafter referred to as ''early adopters'') where such facilities would retire by 2032. For both the existing and new subcategory referenced immediately above, EPA proposes additional requirements for affected facilities to demonstrate permanent cessation of coal combustion or that permanent retirement will occur.

For the one known high flow facility (TVA Cumberland Fossil Plant) and the two known facilities with LUEGUs (GSP Merrimack LLC and Indiana Municipal Power Agency (IMPA) Whitewater Valley Station), the proposed rule would eliminate these two subcategories for FGD wastewater and BA transport water, subjecting those wastestreams to the otherwise applicable requirements for the rest of the industry. For early adopters retiring by 2032, the rule would retain the 2020 rule requirements for FGD wastewater and BA transport water rather than require the new, more stringent zero-discharge requirements for these wastestreams.

Where BAT limitations in this proposed rule are more stringent than previously established BPT and BAT limitations, EPA is proposing that any new limitations would not apply until a date determined by the permitting authority that is as soon as possible on or after [Final Rule Publication Date + 60 days], but no later than December 31, 2029.

For indirect discharges (*i.e.,* discharges to publicly owned treatment works (POTWs)), the proposed rule would establish pretreatment standards for existing sources that are the same as the BAT limitations.

### *C. Summary of Costs and Benefits*

EPA estimates that the proposed rule will cost $200 million per year in social costs and result in $1,557 million per year in monetized benefits using a three percent discount rate and will cost $216 million per year in social costs and result in $1,290 million per year in monetized benefits using a seven percent discount rate.[1] Not all costs and benefits can be fully quantified and monetized, and in particular EPA anticipates the proposed rule would also generate important unquantified benefits (*e.g.,* improved habitat conditions for plants, invertebrates, fish, amphibians, and the wildlife that prey on aquatic organisms). Furthermore, while some health benefits and willingness to pay for water quality

[1] As discussed in Section XII of this preamble, not all benefits could be fully quantified and monetized at this time.



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improvements have been quantified and monetized, those estimates may not fully capture all important water quality-related benefits.

Table I–1 of this preamble summarizes the monetized benefits and social costs for the four regulatory options EPA analyzed at a three percent discount rate. EPA's analysis reflects the Agency's understanding of the actions steam electric power plants are expected to take to meet the limitations and standards in the proposed rule. EPA based its analysis on a modeled baseline that reflects the full implementation of the 2020 rule, the expected effects of announced retirements and fuel conversions, and the impacts of relevant final rules affecting the power sector. Although the baseline does not reflect anticipated impacts on the industry because of the recently passed Inflation Reduction Act (IRA), EPA solicits comment on means by which the Agency could model the impacts of the IRA for the final rule. Because the primary effect of the IRA in the context of this rule would be to increase the number of facilities that permanently cease coal combustion in the baseline, EPA expects that it would proportionally reduce the benefits and costs estimated in this proposal.[2] EPA understands that these modeled results are uncertain and that the actual costs for individual plants could be higher or lower than estimated. The current estimate reflects the best data and analysis currently available. For additional information on costs and benefits, see Sections VIII and XII of this preamble, respectively.

TABLE I–1—TOTAL MONETIZED ANNUALIZED BENEFITS AND COSTS OF FOUR REGULATORY OPTIONS

[Millions of 2021$, three percent discount rate]

| Regulatory option | Total social costs | Total monetized benefits [a b] | Total monetized net benefits [a b] |
|---|---|---|---|
| Option 1 | $88.4 | $696 | $608 |
| Option 2 | 167.0 | 1,336 | 1,169 |
| Option 3 (Preferred) | 200.3 | 1,557 | 1,357 |
| Option 4 | 207.2 | 1,670 | 1,463 |

[a] EPA estimated the air-related benefits for Option 3 using the Integrated Planning Model (IPM). EPA did not analyze Options 1, 2, and 4 using IPM. Instead, EPA extrapolated estimates for Options 1, 2, and 4 air-related benefits from the estimate for Option 3 in proportion to total social costs.

[b] Includes benefits of changes in $CO_2$ air emissions monetized using the Interagency Working Group on the Social Cost of Greenhouse Gases (IWG) SC–$CO_2$ at 3% (average). See Section XII.B.3 of this preamble for benefits monetized using other SC–$CO_2$ values.

## II. Public Participation

Submit your comments, identified by Docket ID No. EPA–HQ–OW–2009–0819, at *www.regulations.gov* (our preferred method), or the other methods identified in the **ADDRESSES** section. Once submitted, comments cannot be edited or removed from the docket. EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be CBI or other information whose disclosure is restricted by statute. Multimedia submissions (*e.g.,* audio, video) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.,* on the web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *www.epa.gov/dockets/commenting-epa-dockets.*

## III. General Information

### *A. Does this action apply to me?*

Entities potentially regulated by any final rule following this action include:

| Category | Example of regulated entity | North American Industry Classification System (NAICS) Code |
|---|---|---|
| Industry | Electric Power Generation Facilities—Electric Power Generation | 22111 |
| | Electric Power Generation Facilities—Fossil Fuel Electric Power Generation | 221112 |

This section is not intended to be exhaustive, but rather provides a guide regarding entities likely to be regulated by any final rule following this action. Other types of entities that do not meet the above criteria could also be regulated. To determine whether your facility is regulated by any final rule following this action, carefully examine the applicability criteria listed in 40 CFR 423.10 and the definitions in 40 CFR 423.11. If you still have questions regarding the applicability of any final rule following this action to a particular entity, consult the person listed for technical information in the preceding **FOR FURTHER INFORMATION CONTACT** section.

### *B. What action is EPA taking?*

The Agency is proposing to revise, and is soliciting comment on possible revision to certain BAT effluent limitations guidelines and pretreatment standards for existing sources in the steam electric power generating point source category that apply to FGD wastewater, BA transport water, CRL, and legacy wastewater.

[2] Furthermore, because the cessation of coal combustion would occur in the baseline, EPA expects that the rule would continue to be economically achievable even after accounting for the IRA.



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*C. What is EPA's authority for taking this action?*

EPA is proposing to promulgate this rule under the authority of sections 301, 304, 306, 307, 308, 402, and 501 of the Clean Water Act (CWA), 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342, and 1361.

*D. What are the monetized incremental costs and benefits of this action?*

This proposed action is estimated to cost $200 million per year in social costs and result in $1,557 million in benefits using a three percent discount rate. Using a seven percent discount rate, the estimated costs are $216 million per year and the benefits are $1,290 million.

**IV. Background**

*A. Clean Water Act*

Congress passed the Federal Water Pollution Control Act Amendments of 1972, also known as the Clean Water Act (CWA), to ''restore and maintain the chemical, physical, and biological integrity of the Nation's waters.'' 33 U.S.C. 1251(a). The CWA establishes a comprehensive program for protecting our nation's waters. Among its core provisions, the CWA prohibits the discharge of pollutants from a point source to waters of the United States (WOTUS), except as authorized under the CWA. Under section 402 of the CWA, discharges may be authorized through a National Pollutant Discharge Elimination System (NPDES) permit. The CWA also authorizes EPA to establish nationally applicable, technology-based ELGs for discharges from different categories of point sources, such as industrial, commercial, and public sources.

The CWA authorizes EPA to promulgate nationally applicable pretreatment standards that restrict pollutant discharges from facilities that discharge wastewater to WOTUS indirectly through sewers flowing to Publicly Owned Treatment Works (POTWs), as outlined in CWA sections 307(b) and (c), 33 U.S.C. 1317(b) and (c). EPA establishes national pretreatment standards for those pollutants in wastewater from indirect dischargers that may pass through, interfere with, or are otherwise incompatible with POTW operations. Pretreatment standards are designed to ensure that wastewaters from direct and indirect industrial dischargers are subject to similar levels of treatment. *See* CWA section 301(b), 33 U.S.C. 1311(b). In addition, POTWs are required to implement local treatment limits applicable to their industrial indirect dischargers to satisfy any local requirements. *See* 40 CFR 403.5.

Direct dischargers (*i.e.,* those discharging directly to surface waters rather than through POTWs) must comply with effluent limitations in NPDES permits. Discharges that flow through groundwater before reaching surface waters must also comply with effluent limitations in NPDES permits if those discharges are the ''functional equivalent'' of a direct discharge. *County of Maui* v. *Hawaii Wildlife Fund,* 140 S. Ct. 1462 (2020). Indirect dischargers, who discharge through POTWs, must comply with pretreatment standards. Technology-based effluent limitations in NPDES permits are derived from effluent limitations guidelines (CWA sections 301 and 304, 33 U.S.C. 1311 and 1314) and new source performance standards (CWA section 306, 33 U.S.C. 1316) promulgated by EPA, or based on best professional judgment (BPJ) where EPA has not promulgated an applicable effluent guideline or new source performance standard. CWA section 402(a)(1)(B), 33 U.S.C. 1342(a)(1)(B); 40 CFR 125.3(c). Additional limitations based on water quality standards are also required to be included in the permit in certain circumstances. CWA section 301(b)(1)(C), 33 U.S.C. 1311(b)(1)(C); 40 CFR 122.44(d). EPA establishes ELGs by regulation for categories of industrial dischargers and are based on the degree of control that can be achieved using various levels of pollution control technology.

EPA promulgates national ELGs for major industrial categories for three classes of pollutants: (1) conventional pollutants (*i.e.,* total suspended solids (TSS), oil and grease, biochemical oxygen demand ($BOD_5$), fecal coliform, and pH), as outlined in CWA section 304(a)(4) and 40 CFR 401.16; (2) toxic pollutants (*e.g.,* toxic metals such as arsenic, mercury, selenium, and chromium; toxic organic pollutants such as benzene, benzo-a-pyrene, phenol, and naphthalene), as outlined in section 307(a) of the Act, 40 CFR 401.15 and 40 CFR part 423 appendix A; and (3) nonconventional pollutants, which are those pollutants that are not categorized as conventional or toxic (*e.g.,* ammonia-N, phosphorus, and total dissolved solids (TDS)).

*B. Relevant Effluent Guidelines*

EPA develops effluent guidelines that are technology-based regulations for a category of dischargers. EPA bases these regulations on the performance of control and treatment technologies. The legislative history of CWA section 304(b), which is the heart of the effluent guidelines program, describes the need to press toward higher levels of control through research and development of new processes, modifications, replacement of obsolete plants and processes, and other improvements in technology, taking into account the cost of controls. Congress has also stated that EPA need not consider water quality impacts on individual water bodies as the guidelines are developed; *see* Statement of Senator Muskie (October 4, 1972), reprinted in Legislative History of the Water Pollution Control Act Amendments of 1972, at 170. (U.S. Senate, Committee on Public Works, Serial No. 93–1, January 1973); *see also Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1005 (''The Administrator must require industry, regardless of a discharge's effect on water quality, to employ defined levels of technology to meet effluent limitations.'') (citations and internal quotations omitted).

There are many technology-based effluent limitations (TBELs) that may apply to a discharger under the CWA: four types of standards applicable to direct dischargers, two types of standards applicable to indirect dischargers, and a default site-specific approach. The TBELs relevant to this rulemaking are described in detail below.

1. Best Practicable Control Technology Currently Available

Traditionally, EPA defines Best Practicable Control Technology (BPT) effluent limitations based on the average of the best performances of facilities within the industry, grouped to reflect various ages, sizes, processes, or other common characteristics. EPA may promulgate BPT effluent limitations for conventional, toxic, and nonconventional pollutants. In specifying BPT, EPA looks at a number of factors. EPA first considers the cost of achieving effluent reductions in relation to the effluent reduction benefits. The agency also considers the age of equipment and facilities, the processes employed, engineering aspects of the control technologies, any required process changes, non-water quality environmental impacts (including energy requirements), and such other factors as the Administrator deems appropriate. *See* CWA section 304(b)(1)(B), 33 U.S.C. 1314(b)(1)(B). If, however, existing performance is uniformly inadequate, EPA may establish limitations based on higher levels of control than what is currently in place in an industrial category, when based on an agency determination that the technology is available in another



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category or subcategory and can be practicably applied.

2. Best Available Technology Economically Achievable

BAT represents the second level of stringency for controlling direct discharge of toxic and nonconventional pollutants. Courts have referred to this as the CWA's ''gold standard'' for controlling discharges from existing sources. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1003. In general, BAT represents the best available, economically achievable performance of facilities in the industrial subcategory or category. As the statutory phrase intends, EPA considers the technological availability and the economic achievability in determining what level of control represents BAT. CWA section 301(b)(2)(A), 33 U.S.C. 1311(b)(2)(A). Other statutory factors that EPA considers in assessing BAT are the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the process employed, potential process changes, and non-water quality environmental impacts, including energy requirements, and such other factors as the Administrator deems appropriate. CWA section 304(b)(2)(B), 33 U.S.C. 1314(b)(2)(B). The agency retains considerable discretion in assigning the weight to be accorded these factors. *Weyerhaeuser Co.* v. *Costle,* 590 F.2d 1011, 1045 (D.C. Cir. 1978). EPA usually determines economic achievability on the basis of the effect of the cost of compliance with BAT limitations on overall industry and subcategory financial conditions. BAT reflects the highest performance in the industry and may reflect a higher level of performance than is currently being achieved based on technology transferred from a different subcategory or category, bench scale or pilot plant studies, or foreign plants. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1006; *American Paper Inst.* v. *Train,* 543 F.2d 328, 353 (D.C. Cir. 1976); *American Frozen Food Inst.* v. *Train,* 539 F.2d 107, 132 (D.C. Cir. 1976). BAT may be based upon process changes or internal controls, even when these technologies are not common industry practice. *See American Frozen Foods,* 539 F.2d at 132, 140; *Reynolds Metals Co.* v. *EPA,* 760 F.2d 549, 562 (4th Cir. 1985); *California & Hawaiian Sugar Co.* v. *EPA,* 553 F.2d 280, 285–88 (2nd Cir. 1977).

3. New Source Performance Standards

New Source Performance Standards (NSPS) reflect effluent reductions that are achievable based on the Best Available Demonstrated Control Technology (BADCT). Owners of new facilities have the opportunity to install the best and most efficient production processes and wastewater treatment technologies. As a result, NSPS should represent the most stringent controls attainable through the application of the BADCT for all pollutants (that is, conventional, nonconventional, and toxic pollutants). In establishing NSPS, EPA is directed to take into consideration the cost of achieving the effluent reduction and any non-water quality environmental impacts and energy requirements. CWA section 306(b)(1)(B), 33 U.S.C. 1316(b)(1)(B).

4. Pretreatment Standards for Existing Sources

Section 307(b), 33 U.S.C. 1317(b), of the Act calls for EPA to issue pretreatment standards for discharges of pollutants to POTWs. Pretreatment standards for existing sources (PSES) are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs. Categorical pretreatment standards are technology-based and are analogous to BPT and BAT effluent limitations guidelines, and thus the agency typically considers the same factors in promulgating PSES as it considers in promulgating BAT. The General Pretreatment Regulations, which set forth the framework for the implementation of categorical pretreatment standards, are found at 40 CFR part 403. These regulations establish pretreatment standards that apply to all non-domestic dischargers. *See* 52 FR 1586 (January 14, 1987).

5. Pretreatment Standards for New Sources

Section 307(c), 33 U.S.C. 1317(c), of the Act calls for EPA to promulgate Pretreatment Standards for New Sources (PSNS). Such pretreatment standards must prevent the discharge of any pollutant into a POTW that may interfere with, pass through, or may otherwise be incompatible with the POTW. EPA promulgates PSNS based on best available demonstrated control technology (BADCT) for new sources. New indirect dischargers have the opportunity to incorporate into their facilities the best available demonstrated technologies. The agency typically considers the same factors in promulgating PSNS as it considers in promulgating NSPS.

6. Best Professional Judgment

The CWA section 301 and its implementing regulation at 40 CFR 125.3(a) indicate that technology-based treatment requirements under section 301(b) of the CWA represent the minimum level of control that must be imposed in an NPDES permit. Where EPA-promulgated effluent guidelines are not applicable to a non-POTW discharge, or where such EPA-promulgated guidelines have been vacated by a court, such treatment requirements are established on a case-by-case basis using the permitting writer's best professional judgment (BPJ). Case-by-case TBELs are developed pursuant to CWA section 402(a)(1), which authorizes EPA Administrator to issue a permit that will meet either: all applicable requirements developed under the authority of other sections of the CWA (*e.g.,* technology-based treatment standards, water quality standards, ocean discharge criteria) or, before taking the necessary implementing actions related to those requirements, ''such conditions as the Administrator determines are necessary to carry out the provisions of this Act.'' The regulation at 40 CFR 125.3(c)(2) cites this section of the CWA, stating that technology-based treatment requirements may be imposed in a permit ''on a case-by-case basis under section 402(a)(1) of the Act, to the extent that EPA-promulgated effluent limitations are inapplicable.'' Further, section 125.3(c)(3) indicates, ''[w]here promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to certain pollutants, other aspects or activities are subject to regulation on a case-by-case basis in order to carry out the provisions of the Act.'' The factors considered by the permit writer are the same. *See* 40 CFR 125.3(d)(1)–(3).

*C. 2015 Steam Electric Power Generation Point Source Category Rule*

1. Final Rule Requirements

On September 30, 2015, EPA promulgated a rule revising the regulations for the Steam Electric Power Generating point source category (40 CFR part 423) (hereinafter the ''2015 rule''). The rule set the first Federal limitations on the levels of toxic metals that can be discharged in the steam electric industry's largest sources of wastewater, based on technology improvements in the steam electric power industry over the preceding three decades. Before the 2015 rule, regulations for the industry were last updated in 1982.

Over the last 30 years, new technologies for generating electric power and the widespread implementation of air pollution controls



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have altered existing wastewater streams or created new wastewater streams at many steam electric facilities, particularly coal-fired facilities. Discharges of these wastestreams include arsenic, lead, mercury, selenium, chromium, and cadmium. Once in the environment, many of these toxic pollutants can remain there for years and continue to cause impacts.

The 2015 rule addressed effluent limitations and standards for multiple wastestreams generated by new and existing steam electric facilities: BA transport water, CRL, FGD wastewater, FGMC wastewater, FA transport water, gasification wastewater, and legacy wastewater. The rule required most steam electric facilities to comply with the effluent limitations ''as soon as possible'' after November 1, 2018, and no later than December 31, 2023. NPDES permitting authorities established particular compliance date(s) within that range for each facility (except for indirect dischargers) at the time they reissued the facility's NPDES permit.

The 2015 rule was projected to reduce the amount of metals defined in the CWA as toxic pollutants, nutrients, and other pollutants that steam electric facilities are allowed to discharge by 1.4 billion pounds per year and reduce water withdrawal by 57 billion gallons. At the time, EPA estimated annual compliance costs for the final rule to be $480 million (in 2013 dollars) and estimated benefits associated with the rule to be $451 to $566 million (in 2013 dollars).

2. Vacatur of Limitations Applicable to CRL and Legacy Wastewater

Seven petitions for review of the 2015 rule were filed in various circuit courts by the electric utility industry, environmental groups, and drinking water utilities. These petitions were consolidated in the U.S. Court of Appeals for the Fifth Circuit, *Southwestern Electric Power Co.* v. *EPA,* Case No. 15–60821 (5th Cir.). On March 24, 2017, the Utility Water Act Group submitted to EPA an administrative petition for reconsideration of the 2015 rule. On April 5, 2017, the Small Business Administration (SBA) submitted an administrative petition for reconsideration of the 2015 rule.

On August 11, 2017, the Administrator announced his decision to conduct a rulemaking to potentially revise the new, more stringent BAT effluent limitations and pretreatment standards for existing sources in the 2015 rule that apply to FGD wastewater and BA transport water. The Fifth Circuit subsequently granted EPA's request to sever and hold in abeyance petitioners' claims related to those limitations and standards, and those claims are still in abeyance. With respect to the remaining claims related to limitations applicable to legacy wastewater and CRL, the Fifth Circuit issued a decision on April 12, 2019, vacating those limitations as arbitrary and capricious under the Administrative Procedure Act and unlawful under the CWA, respectively. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d 999. In particular, the Court rejected EPA's attempts to set BAT limitations for each wastestream equal to previously promulgated BPT limitations based on surface impoundments. In the case of legacy wastewater, the Court held that EPA's record on surface impoundments did not support BAT limitations based on surface impoundments. *Id.* At 1015. In the case of CRL, the Court held that EPA's setting of BAT limitations equal to BPT limitations was an impermissible conflation of the two standards, which are supposed to be progressively more stringent, and that EPA's rationale was not authorized by the statutory factors for determining BAT. *Id.* At 1026. After the Court's decision, EPA announced its plans to address the vacated limitations in a later action after the 2020 rule.

In September 2017, using notice-and-comment procedures, EPA finalized a rule (''postponement rule'') postponing the earliest compliance dates for the more stringent BAT effluent limitations and PSES for FGD wastewater and BA transport water in the 2015 rule, from November 1, 2018, to November 1, 2020. EPA also withdrew a prior action it had taken to stay parts of the 2015 rule pursuant to Section 705 of the Administrative Procedure Act, 5 U.S.C. 705. The postponement rule received multiple legal challenges, but EPA prevailed, and the courts did not sustain any of them.[3]

*D. 2020 Steam Electric Reconsideration Rule and Recent Developments*

1. Final Rule Requirements

On August 31, 2020, EPA promulgated the *Steam Electric Reconsideration Rule* (hereinafter the ''2020 rule''). The 2020 rule revised requirements for FGD wastewater and BA transport water applicable to existing sources. Specifically, the 2020 rule made four changes to the 2015 rule. First, the rule changed the technology basis for control of FGD wastewater and BA transport water. For FGD wastewater, the technology basis was changed from chemical precipitation plus high hydraulic residence time biological reduction to chemical precipitation plus low hydraulic residence time biological reduction. This change in the technology basis resulted in less stringent selenium limitations but more stringent mercury and nitrogen limitations. For BA transport water, the technology basis was changed from dry handling or closed-loop systems to high recycle rate systems, allowing for a site-specific purge not to exceed 10 percent of the system volume. This change in technology resulted in less stringent limitations for all pollutants in BA transport water. Second, the 2020 rule revised the technology basis for the voluntary incentives program (VIP) for FGD wastewater from vapor compression evaporation to chemical precipitation plus membrane filtration. This change in the technology basis resulted in less stringent limitations for most pollutants but added new limitations for bromide and nitrogen. Third, the 2020 rule created three new subcategories for high-flow facilities, LUEGUs, and EGUs permanently ceasing coal combustion by 2028. These subcategories were subject to less stringent limitations. Finally, the 2020 rule required most steam electric facilities to comply with the revised effluent limitations ''as soon as possible'' after October 13, 2021, and no later than December 31, 2025.[4] NPDES permitting authorities established the particular compliance date(s) within that range for each facility (except for indirect dischargers) at the time they reissued the facility's NPDES permit.

2. Fourth Circuit Court of Appeals Litigation

Two petitions for review of the 2020 rule were timely filed by environmental group petitioners and consolidated in the U.S. Court of Appeals for the Fourth Circuit on November 19, 2020. *Appalachian Voices, et al.* v. *EPA,* No. 20–2187 (4th Cir.). An industry trade group and certain energy companies moved to intervene in the litigation, which the Court granted on December 3, 2020.

3. Executive Order 13990

On January 20, 2021, President Biden issued Executive Order (E.O.) 13990:

[3] *See Center for Biological Diversity* v. *EPA,* No. 18–cv–00050 (D. Ariz. filed January 20, 2018); *see also Clean Water Action.* v. *EPA,* No. 18–60079 (5th Cir.). On October 29, 2018, the District of Arizona case was dismissed upon EPA's motion to dismiss for lack of jurisdiction, and on August 28, 2019, the Fifth Circuit denied the petition for review of the postponement rule.

[4] The 2015 rule's VIP compliance date was revised to December 31, 2028, in the 2020 rule.



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*Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis* (86 FR 7037). E.O. 13990 directed Federal agencies to immediately review and, if necessary, take action to address the promulgation of Federal regulations and other actions during the previous four years that conflict with the national objectives of protecting public health and the environment. A list of regulations to be reviewed, including the 2020 rule, was released in conjunction with this E.O.

4. Announcement of Supplemental Rule and Preliminary Effluent Guidelines Plan 15

On July 26, 2021, EPA announced the new rulemaking to strengthen certain wastewater pollution discharge limitations for coal-fired power plants that use steam to generate electricity. EPA later clarified that, as part of its new rulemaking, it would be reconsidering all aspects of the 2020 rule.[5] EPA undertook an evidence-based, science-based review of the 2020 Steam Electric Reconsideration Rule under E.O. 13990, finding that there are opportunities to strengthen certain wastewater pollution discharge limitations. For example, EPA discussed how treatment systems using membranes have advanced since the 2020 rule's promulgation and continue to rapidly advance as an effective option for treating a wide variety of industrial pollution, including pollution from steam electric power plants. In the announcement, EPA also confirmed that until a new rule is promulgated, the 2015 and 2020 regulations will continue to be implemented and enforced to achieve needed pollutant reductions.

In September 2021, EPA issued *Preliminary Effluent Guidelines Program Plan 15*.[6] This document discussed the annual review of effluent limitations guidelines and pretreatment standards, rulemakings for new and existing industrial point source categories, and any new or existing sources receiving further analyses. Here, EPA not only discussed the wastestreams affected by the 2020 rule (FGD wastewater and BA transport water), but also the wastestreams from the 2015 rule which had limitations vacated and remanded to the Agency (*i.e.,* CRL and legacy wastewater). This was the first time EPA had publicly presented information that the supplemental rulemaking could cover these wastestreams as well. For further discussion of the vacatur and remand of the 2015 limitations applicable to CRL and legacy wastewater, see Section IV.D of this preamble.

*E. Other Ongoing Rules Impacting the Steam Electric Sector*

1. Coal Combustion Residuals Disposal Rule

On April 17, 2015, EPA promulgated the Disposal of Coal Combustion Residuals from Electric Utilities final rule (2015 CCR rule). This rule finalized national regulations to provide a comprehensive set of requirements for the safe disposal of coal combustion residuals (CCR), commonly referred to as coal ash, from steam electric power plants. The final 2015 CCR rule was the culmination of extensive study on the effects of coal ash on the environment and public health. The rule established technical requirements for CCR landfills and surface impoundments under subtitle D of the Resource Conservation and Recovery Act (RCRA), the nation's primary law for regulating solid waste.

These regulations established requirements for the management and disposal of coal ash, including requirements designed to prevent leaking of contaminants into groundwater, blowing of contaminants into the air as dust, and the catastrophic failure of coal ash surface impoundments. The 2015 CCR rule also set recordkeeping and reporting requirements, as well as requirements for each plant to establish and post specific information to a publicly accessible website. The rule also established requirements to distinguish between the beneficial use of CCR from disposal.

As a result of the D.C. Circuit Court decisions in *Utility Solid Waste Activities Group* v. *EPA,* 901 F.3d 414 (D.C. Cir. 2018), and *Waterkeeper Alliance Inc. et al.* v. *EPA,* No. 18–1289 (D.C. Cir. filed March 13, 2019), the Administrator signed two rules: *A Holistic Approach to Closure Part A: Deadline to Initiate Closure and Enhancing Public Access to Information* (CCR Part A rule) on July 29, 2020, and *A Holistic Approach to Closure Part B: Alternate Liner Demonstration* (CCR Part B rule) on October 15, 2020. EPA finalized five amendments to the 2015 CCR rule which continue to impact the wastewaters covered by this ELG. First, the CCR Part A rule established a new deadline of April 11, 2021, for all unlined surface impoundments, as well as those surface impoundments that failed the location restriction for placement above the uppermost aquifer, to stop receiving waste and begin closure or retrofitting. EPA established this date after evaluating the steps that owners and operators need to take for surface impoundments to stop receiving waste and begin closure, and the timeframes needed for implementation. (This would not affect the ability of plants to install new, composite-lined surface impoundments.) Second, the Part A rule established procedures for plants to obtain approval from EPA for additional time to develop alternative disposal capacity to manage their wastestreams (both coal ash and noncoal ash) before they must stop receiving waste and begin closing their coal ash surface impoundments. Third, the Part A rule changed the classification of compacted-soil-lined and clay-lined surface impoundments from lined to unlined. Fourth, the Part B rule finalized procedures potentially allowing a limited number of facilities to demonstrate to EPA that, based on groundwater data and the design of a particular surface impoundment, the unit ensures there is no reasonable probability of adverse effects to human health and the environment. Should such a submission be approved, these CCR surface impoundments would be allowed to continue to operate.

As explained in the 2015 and 2020 ELG rules, the ELGs and CCR rules may affect the same EGU or activity at a plant. Therefore, when EPA finalized the ELG and CCR rules in 2015, and revisions to both rules in 2020, the Agency coordinated the ELG and CCR rules to minimize the complexity of implementing engineering, financial, and permitting activities. EPA considered the interaction of these two rules during the development of this proposal. EPA's analysis builds in the final requirements of these rules in the baseline accounting for the most recent data provided under the CCR rule reporting and recordkeeping requirements. This is further described in Supplemental TDD, Section 3. For more information on the CCR Part A and Part B rules, including information about their ongoing implementation, visit *www.epa.gov/coalash/coal-ash-rule*.

2. Air Pollution Rules and Implementation

EPA is taking several actions to regulate a variety of conventional, hazardous, and greenhouse gas (GHG) air pollutants, including actions to regulate the same steam electric plants subject to Part 423. Other actions impact steam electric plants indirectly when implemented by states. In light of these

[5] On April 8, 2022, the U.S. Court of Appeals for the Fourth Circuit granted EPA's motion for a long-term abeyance of the litigation challenging the 2020 rule, pending this rulemaking.

[6] Available online at: *www.epa.gov/system/files/documents/2021–09/ow-prelim-elg-plan-15_508.pdf*.



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ongoing actions, EPA has worked to consider appropriate flexibilities in this proposed ELG rule to provide certainty to the regulated community while ensuring the statutory objectives of each program are achieved. Furthermore, to the extent that these actions are finalized and already impacting steam electric plant operations, EPA has accounted for these changed operations in its IPM modeling discussed in Section VIII of this preamble.

a. The Revised Cross State Air Pollution Rule (CSAPR) Update and the Proposed Good Neighbor Plan for the 2015 Ozone National Ambient Air Quality Standards (NAAQS)

EPA recently completed a rulemaking to address ''good neighbor'' obligations for the 2008 ozone national ambient air quality standards (NAAQS) and proposed a rulemaking in 2022 with respect to the same statutory obligations for the 2015 ozone NAAQS. These actions implement the Clean Air Act's (CAA's) prohibition on emissions that significantly contribute to nonattainment or interfere with maintenance of the NAAQS in other states.

On April 30, 2021, EPA published the final Revised Cross-State Air Pollution Rule (CSAPR) Update, 86 FR 23054, which resolved 21 states' good neighbor obligations for the 2008 ozone NAAQS, following the remand of the 2016 CSAPR Update (81 FR 74504, October 26, 2016) in *Wisconsin* v. *EPA,* 938 F.3d 308 (D.C. Cir. 2019). Between them, these two rules establish the Group 2 and Group 3 market-based emissions trading programs for 22 states in the eastern United States for emissions of oxides of nitrogen ($NO_X$) from fossil fuel-fired EGUs during the summer ozone season.

On February 28, 2022, the Administrator signed a proposed rule, Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standards, 87 FR 20036 (April 6, 2022) (also called the Good Neighbor Plan). This proposed rule includes further ozone-season $NO_X$ pollution reduction requirements for fossil fuel-fired EGUs to address 25 states' good neighbor obligations for the 2015 ozone NAAQS. The proposed rule would establish an enhanced Group 3 market-based emissions trading program with $NO_X$ budgets for EGUs in those 25 states, beginning in 2023. Further information about this proposal is available on EPA's website.[7]

[7] *See www.epa.gov/csapr/good-neighbor-plan-2015-ozone-naaqs.*

b. Clean Air Act Section 111 Rule

On October 23, 2015, EPA finalized NSPSs for emissions from new, modified, and reconstructed fossil fuel-fired EGUs under CAA section 111(b). Specifically, the 2015 NSPS established separate standards for emissions of $CO_2$ from newly constructed, modified, and reconstructed fossil fuel-fired electric utility steam generating units (*i.e.,* utility EGUs and integrated gasification combined cycle units) and from newly constructed and reconstructed fossil fuel-fired stationary combustion turbines. The standards set in the 2015 NSPS reflected the degree of emission limitation achievable through application of the best system of emission reduction that EPA determined to have been adequately demonstrated for each type of unit and was codified in 40 CFR part 60, subpart TTTT. EPA is currently reviewing the 2015 NSPS—including new technologies to mitigate GHG emissions from new, modified, and reconstructed stationary combustion turbines—and will, if warranted, propose to revise the NSPSs in an upcoming rulemaking.

On August 3, 2015, under CAA section 111(d), EPA promulgated its first emission guidelines regulating emissions from existing fossil fuel-fired EGUs in the Clean Power Plan (CPP) (40 CFR part 60, subpart UUUU). The CPP was subsequently stayed by the U.S. Supreme Court. On June 19, 2019, EPA promulgated new emission guidelines, known as the Affordable Clean Energy (ACE) Rule (40 CFR part 60, subpart UUUUa), and issued a repeal of the CPP. On January 19, 2021, the U.S. Court of Appeals for the D.C. Circuit vacated the ACE Rule and remanded the rule to EPA for further consideration consistent with its decision. The Supreme Court then overturned portions of the D.C. Circuit Court's decision in *West Virginia* v. *EPA,* No. 20–1530, in June 2022. EPA is now considering the implications of the Supreme Court's decision and is undertaking a new rulemaking to establish new emission guidelines under CAA section 111(d) to limit emissions from existing fossil fuel-fired EGUs.

c. Mercury and Air Toxics Standards Rule

After considering costs, EPA recently proposed to reaffirm the determination that it is appropriate and necessary to regulate hazardous air pollutants (HAPs), including mercury, from coal- and oil-fired steam generating power plants. These regulations are known as the Mercury and Air Toxics Standards (MATS) for power plants. The proposed MATS action would revoke a 2020 finding that it is not appropriate and necessary to regulate coal- and oil-fired power plants under CAA section 112, but which did not disturb the underlying MATS regulations. The MATS proposal would ensure that coal- and oil-fired power plants continue to control emissions of toxic air pollution, including mercury.

d. National Ambient Air Quality Standards Rules for Particulate Matter

EPA is currently reconsidering a December 7, 2020, decision to retain the primary (health-based) and secondary (welfare-based) NAAQS for particulate matter (PM).[8] EPA is reconsidering the December 2020 decision because available scientific evidence and technical information indicate that the current standards may not be adequate to protect public health and welfare, as required by the CAA.

## V. Steam Electric Power Generating Industry Description

### *A. General Description of Industry*

EPA provided a general description of the steam electric power generating industry in the 2013 proposed rule, the 2015 final rule, the 2019 proposed rule, and the 2020 final rule, and has continued to collect information and update that industry profile. The previous descriptions reflected the known information about the universe of steam electric power plants and incorporated final environmental regulations applicable at that time. For this proposal, as described in the Supplemental TDD, Section 3, EPA has revised its description of the steam electric power generating industry (and its supporting analyses) to incorporate major changes such as additional retirements, fuel conversions, ash handling conversions, wastewater treatment updates, and updated information on capacity utilization.[9] The analyses supporting the proposed rule use an updated baseline that incorporates these changes in the industry. The analyses then compare the effect of the proposed rule's requirements for FGD wastewater, BA transport water, CRL, and legacy wastewater to the effect on the industry (as it exists today) of the 2015 and 2020 rules' limitations for FGD wastewater,

[8] *See www.epa.gov/newsreleases/epa-reexamine-health-standards-harmful-soot-previous-administration-left-unchanged.*

[9] The data presented in the general description continue to reflect some conditions existing in 2009, as the 2010 steam electric industry survey remains EPA's best available source of information for characterizing operations across the industry.



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BA transport water, CRL, and legacy wastewater.

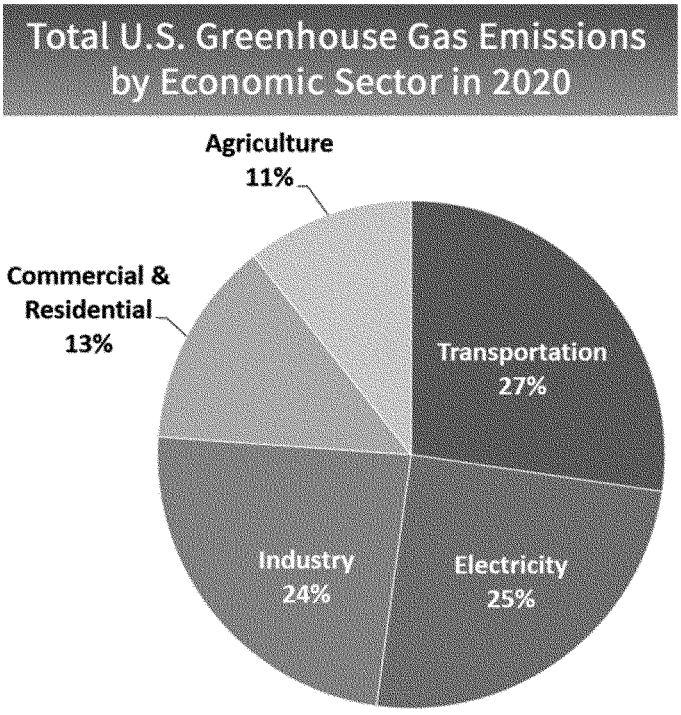
As described in the Regulatory Impact Analysis, of the 871 steam electric power plants in the country identified by EPA, only those coal-fired power plants that discharge FGD wastewater, BA transport water, CRL, and/or legacy wastewater may incur compliance costs under this proposal. EPA estimates that 69 to 93 such plants may incur compliance costs under the regulatory options in this proposal. For further information about plant retirements, fuel conversions, ash handling conversions, wastewater treatment updates, and updated information on capacity utilization, see *Changes to Industry Profile for Coal-Fired Generating Units for the Steam Electric Effluent Guidelines Proposed Rule* (DCN SE10241).

*B. Greenhouse Gas Reduction Targets, the Inflation Reduction Act, and Potential Impacts on Current Market Conditions*

While this proposal was motivated by the CWA and by the need to address water pollution, EPA acknowledges that there are also large changes happening in the industry, in part due to a series of actions targeted toward GHG reductions. First, in April 22, 2021, President Biden announced new 2030 GHG reduction targets for the United States.[10] As part of reaching net zero emissions by 2050, the nationally determined contribution submitted to the United Nations Framework Convention on Climate Change includes a 50–52 percent reduction from 2005 levels by 2030. These reduction targets were developed by the National Climate Task Force and support the United States' commitments under the Paris Agreement.

The steam electric sector is one of the largest contributors of U.S. GHG emissions. Figure IV–1 of this preamble below is reproduced from EPA's website.[11] As shown in the figure, EPA estimates that 25 percent of 2020 GHG emissions in the United States came from electricity generation (largely comprised of emissions from steam electric power plants). Although this fraction continues to decline, several models looking at plausible pathways to meet the announced 2030 goal have estimated that substantial additional GHG reductions from coal combustion will be necessary.[12]

**Figure IV-1. 2020 Greenhouse Gas Emissions[13,14]**




The GHG reduction targets did not directly impose incentives on steam electric plants; however, on August 16, 2022, President Biden signed the IRA into law. The IRA includes many provisions that will affect the steam electric power generating industry. The IRA provides tax credits, financing programs, and other incentives that will accelerate the transition to forms of energy that produce little or no GHG emissions. An analysis conducted by the Department of Energy (DOE) shows that tax incentives included in the IRA will increase the growth of wind and

[10] *See www.whitehouse.gov/ceq/news-updates/2021/12/13/icymi-president-biden-signs-executive-order-catalyzing-americas-clean-energy-economy-through-federal-sustainability/.*

[11] *See www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions.*

[12] Bistline, J., Abhyankar, N., Blanford, G., Clarke, L., Fakhry, R., Mcjeon, H., Reilly, J., Roney, C., Wilson, T., Yuan, M., and Zhao, A. 2022. *Actions for reducing US emissions at least 50% by 2030. Policies must help decarbonize power and transport sectors. Science.* Vol 376, Issue 6596. Pg 922–924. May 26. Available online at: *www.science.org/doi/10.1126/science.abn0661.*

[13] Total emissions in 2020 = 5,981 million metric tons of $CO_2$ equivalent. Percentages may not add up to 100 percent due to independent rounding.

[14] Land use, land-use change, and forestry in the United States is a net sink and removes approximately 13 percent of these GHG emissions. This net sink is not shown in the above diagram. All emission estimates are from the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2020.* Available online at: *www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.*



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solar electricity generation while supporting the maintenance of the country's existing nuclear power fleet.[15] Thus, the DOE analysis suggests the IRA may reduce the number of coal burning power plants in operation.

Based on these DOE analytic results EPA would expect reduced baseline emissions of air and water pollution, lower total incremental costs, and lower total incremental benefits of this rule. Lower costs and benefits would alter the regulatory impact analysis under E.O. 12866 and E.O. 13563. While the impacts of the IRA are not reflected in the detailed analyses included with this proposal (because the analyses were completed prior to the passage of the IRA), EPA is evaluating how the IRA can be incorporated into the baseline of the final rule (including IPM) and will update the analyses to reflect the IRA for any final rule. EPA solicits comment on the incorporation of the IRA into its analyses, including any specific recommendations or data supporting a particular approach.

EPA does not expect the IRA to affect the current findings of economic achievability of the rule. To evaluate economic achievability, EPA considers the costs of the technologies that form the basis for BAT and uses IPM to assess changes in the power sector, including closures. As discussed in Section VIII of this preamble, EPA expects the costs of the technologies discussed here to result in a single coal-fired power plant closure; thus, the rule would be economically achievable.

### *C. Control and Treatment Technologies*

In general, control and treatment technologies for some wastestreams have continued to advance since the 2015 and 2020 rules. Often, these advancements provide plants with additional approaches for complying with any effluent limitations. In some cases, these advancements have also decreased the associated costs of compliance. For this proposal, EPA incorporated updated information and evaluated several technologies available to control and treat FGD wastewater, BA transport water, CRL, and legacy wastewater generated by the steam electric industry. See Section VIII of this preamble for details on updated cost information.

#### 1. FGD Wastewater

FGD scrubber systems are used to remove sulfur dioxide from flue gas so it is not emitted into the air. Dry FGD systems use water in their operation but generally do not discharge wastewater as it is evaporated during operation, while wet FGD systems produce a wastewater stream.

Steam electric power plants discharging FGD wastewater currently employ a variety of wastewater treatment technologies and operating/management practices to reduce the pollutants associated with FGD wastewater discharges. EPA identified the following types of treatment and handling practices for FGD wastewater as part of the 2015 and 2020 rules:

- *Chemical precipitation.* Chemicals are added as part of the treatment system to help remove suspended solids and dissolved solids, particularly metals. The precipitated solids are then removed from solution by coagulation/flocculation followed by clarification and/or filtration. The 2015 and 2020 rules focused on a specific design that employs hydroxide precipitation, sulfide precipitation (organosulfide), and iron coprecipitation to remove suspended solids and to convert soluble metal ions to insoluble metal hydroxides or sulfides. Chemical precipitation was part of the BAT technology basis for the effluent limitations in the 2015 and 2020 rule.
- *High hydraulic residence time biological reduction (HRTR).* EPA identified three types of biological treatment systems used to treat FGD wastewater: anoxic/anaerobic fixed-film bioreactors (which target removals of nitrogen compounds and selenium), anoxic/anaerobic suspended growth systems (which target removals of selenium and other metals), and aerobic/anaerobic sequencing batch reactors (which target removals of organics and nutrients). An anoxic/anaerobic fixed-film bioreactor designed to remove selenium and nitrogen compounds using high hydraulic residence times of approximately 10 to 16 hours was the BAT technology basis for the effluent limitations in the 2015 rule.
- *Low hydraulic residence time biological reduction (LRTR).* A biological treatment system that targets removal of selenium and nitrate/nitrite using fixed-film bioreactors in smaller, more compact reaction vessels. This system differs from the HRTR biological treatment system evaluated in the 2015 rule, in that the LRTR system is designed to operate with a shorter residence time (approximately one to four hours, compared to a residence time of 10 to 16 hours for HRTR), while still achieving significant removal of selenium and nitrate/nitrite. LRTR was the BAT technology basis for the effluent limitations in the 2020 rule.
- *Membrane filtration.* A membrane filtration system (*e.g.,* microfiltration, ultrafiltration, nanofiltration, forward osmosis (FO), electrodialysis reversal (EDR), or reverse osmosis (RO)) designed specifically for high TDS and TSS wastestreams. These systems are designed to minimize fouling and scaling associated with industrial wastewater. These systems typically use pretreatment for potential scaling agents (*e.g.,* calcium, magnesium, sulfates) combined with one or more type of membrane technology to remove a broad array of particulate and dissolved pollutants from FGD wastewater. The membrane filtration units may also employ advanced techniques, such as vibration or creation of vortexes to mitigate fouling or scaling of the membrane surfaces. Membrane filtration can achieve zero discharge by recirculating permeate from the RO system back into plant operations.
- *Spray evaporation.* Spray evaporation technologies, which include spray dry evaporators (SDEs) and other similar proprietary variations, evaporate water by spraying fine misted wastewater into hot gasses. The hot gasses allow the water to evaporate before contacting the walls of an evaporation vessel, treating wastewater across a range of water quality characteristics such as TDS, TSS, or scale forming potential. Spray evaporation technologies use a less complex treatment configuration than brine concentrator and crystallizer systems (*see* the description of thermal evaporation systems) to evaporate water by a heat source, such as a slipstream of hot flue gas or an external natural gas burner. Spray evaporation technologies can be used in combination with other volume reduction technologies, such as membranes, to maximize the efficiency of each process. Concentrate from the RO system can then be processed through the spray evaporation technology to achieve zero discharge by recirculating permeate from the RO system back into plant operations.
- *Thermal evaporation.* Thermal evaporation systems that use a falling-film evaporator (or brine concentrator), following a softening pretreatment step, to produce a concentrated wastewater stream and a distillate stream to reduce wastewater volume by 80 to 90 percent and reduce the discharge of pollutants. The concentrated wastewater is usually further processed in a crystallizer that produces a solid residue for landfill disposal and additional distillate that can be reused within the plant or discharged. These systems are designed

[15] *See www.energy.gov/sites/default/files/2022-08/8.18%20InflationReductionAct_Factsheet_Final.pdf.*



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to remove the broad spectrum of pollutants present in FGD wastewater to very low effluent concentrations.

- Some plants operate their wet FGD systems using approaches that eliminate the discharge of FGD wastewater. These plants use a variety of operating and management practices to achieve this, including the following:

—*Complete recycle.* The FGD Wastestream is allowed to recirculate. Particulates (*e.g.,* precipitates and other solids) are removed and landfilled. Water is supplemented when needed to replace that evaporated or removed with landfilled solids. This process does not produce a saleable product (*e.g.,* wallboard grade gypsum) but it does not need a wastewater purge stream to maintain low levels of chloride.

—*Evaporation impoundments.* Some plants located in warm, dry climates have been able to use surface impoundments as holding basins where the FGD wastewater is retained until it evaporates. The evaporation rate from the impoundments at these plants is greater than the flow rate of the FGD wastewater and amount of precipitation entering the impoundments; therefore, there is no discharge to surface water.[16] These impoundments must be large enough to accommodate extreme precipitation events to prevent overtopping and runoff.

—*FA conditioning*. Many plants that operate dry FA handling systems will utilize the water from their FGD system in the FA handling system to suppress dust or improve handling and/or compaction characteristics in an on-site landfill.

—*Combination of wet and dry FGD systems*. The dry FGD process involves atomizing and injecting wet lime slurry, which ranges from approximately 18 to 25 percent solids, into a spray dryer. The water contained in the slurry evaporates from the heat of the flue gas within the system, leaving a dry residue that is removed from the flue gas by a fabric filter (*i.e.,* baghouse) or electrostatic precipitator.

—*Underground injection*. These systems dispose of wastes by injecting them into a permitted underground injection well as an alternative to discharging wastewater to surface waters.

EPA also collected new information on other FGD wastewater treatment technologies, including direct contact thermal evaporators and ion exchange. These treatment technologies have been evaluated, in full- or pilot-scale, or are being developed to treat FGD wastewater. See Section 4.1 of the Supplemental TDD for more information on these technologies.

2. BA Transport Water

BA consists of heavier ash particles that are not entrained in the flue gas and fall to the bottom of the furnace. In most furnaces, the hot BA is quenched in a water-filled hopper.[17] Some plants use water to transport (sluice) the BA from the hopper to an impoundment or dewatering bins. The water used to transport the BA to the impoundment or dewatering bins is usually discharged to surface water as overflow from the systems after the BA has settled to the bottom. The industry also uses the following BA handling systems that generate BA transport water:

- *Remote mechanical drag system (MDS).* These systems transport BA to a remote MDS using the same processes as wet-sluicing systems. A drag chain conveyor pulls the BA out of the water bath on an incline to dewater the BA. The system can either be operated as a closed-loop system (technology basis for the 2015 rule) or a high recycle rate system (technology basis for the 2020 rule).[18]
- *Mobile MDS.* This technology is a smaller, mobile version of a remote MDS with an additional clarification system. It is not intended to be a permanent installation, allowing for the reduction of capital costs as facility needs allow. Once in place, the system works like a remote MDS—the incoming water is clarified and primary separation occurs. The clarified water is taken from the mechanical drag system to a mobile clarifier and polished to a level suitable for recirculation. The mobile clarifier thickens the collected solids, which are then sent back to the mechanical drag system portion and mixed with coarse BA. This mixture is sent up an incline, dewatered, and disposed of.
- *Dense slurry system.* These systems use a dry vacuum or pressure system to convey the BA to a silo (as described below for the ''Dry Vacuum or Pressure System''), but instead of using trucks to transport the BA to a landfill, the plant mixes the BA with a lower percentage of water compared to a wet-sluicing system and pumps the mixture to the landfill.

As part of the 2020 rule and this proposed rule, EPA identified the following BA handling systems that do not, by definition or practice, generate BA transport water.

- *MDS.* These systems are located directly underneath the boiler. The BA is collected in a water quench bath. A drag chain conveyor pulls the BA out of the water bath along an incline to dewater the BA.
- *Dry mechanical conveyor.* These systems are located directly underneath the boiler. The system uses ambient air to cool the BA in the boiler and then transports the ash out from under the boiler using a conveyor. There is no water used in this process.
- *Dry vacuum or pressure system.* These systems transport BA from the boiler to a dry hopper without using any water. Air is percolated through the ash to cool it and combust unburned carbon. Cooled ash then drops to a crusher and is conveyed via vacuum or pressure to an intermediate storage destination.
- *Vibratory belt system.* These systems deposit BA on a vibratory conveyor trough, where the ash is air-cooled and ultimately moved through the conveyor deck to an intermediate storage destination without using any water.
- *Submerged grind conveyor.* These systems are located directly underneath the boiler and are designed to reuse slag tanks, ash gates, clinker grinders, and transfer enclosures from the existing wet sluicing systems. The system collects BA from the discharge of each clinker grinder. A series of submerged drag chain conveyors transport and dewater the BA.

See Section 4.2 of the Supplemental TDD for more information on these technologies.

3. CRL

In promulgating the 2015 rule, EPA determined that combustion residual leachate from landfills and impoundments includes similar types of constituents as FGD wastewater, albeit at potentially lower concentrations and smaller volumes. Based on this characterization of the wastewater and knowledge of treatment technologies, EPA determined that certain treatment technologies identified for FGD wastewater could also be used to treat leachate from landfills and impoundments containing combustion residuals. These technologies, described in Section V.C.1, of this preamble include chemical precipitation,

[16] Such impoundments must be lined based on the requirements in the CCR rule. This would significantly reduce the potential of a discharge to groundwater.

[17] Consistent with the 2015 and 2020 rule, boiler slag is considered BA.

[18] In some cases, additional treatment may be necessary to maintain a closed-loop system. This additional treatment could include polymer addition to enhance removal of suspended solids or membrane filtration of a slip stream to remove dissolved solids.



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biological treatment (including LRTR), membrane filtration, spray evaporation, or other thermal treatment options. EPA also identified other management and reuse strategies from responses to the 2010 *Questionnaire for the Steam Electric Power Generating Effluent Guidelines,* or steam electric survey, that included using CRL from either an impoundment or landfill for moisture conditioning FA, dust control, or truck wash. EPA also identified plants that collect CRL from impoundments and recycle it directly back to the impoundment.

4. Legacy Wastewater

Legacy wastewater can be comprised of FGD wastewater, BA transport water, FA transport water, CRL, gasification wastewater and/or FGMC wastewater generated before the ''as soon as possible'' date that more stringent effluent limitations from the 2015 or 2020 rules would apply. Discharges of legacy wastewater may occur through an intermediary source (*e.g.,* a tank or surface impoundment) or directly into a surface waterbody (*see* Section VII.B.4 of this preamble). The record indicates that the following technologies can be applied to treat this type of legacy wastewater: chemical precipitation, biological treatment (including LRTR), membrane filtration, spray evaporation, or other thermal treatment options. These technologies are described in Section V.C.1 of this preamble. Another option, which may be used in combination with other systems such as chemical and physical treatment, is zero valent iron (ZVI).

- ZVI. This technology can be used to target specific inorganics, including selenium, arsenic, nitrate, and mercury in this type of legacy wastewater. The technology entails mixing influent wastewater with ZVI (iron in its elemental form), which reacts with oxyanions, metal cations, and some organic molecules in wastewater. ZVI causes a reduction reaction of these pollutants, after which the pollutants are immobilized through surface adsorption onto iron oxide coated on the ZVI or generated from oxidation of elemental iron. The coated, or spent, ZVI is separated from the wastewater with a clarifier. The quantity of ZVI required and number of reaction vessels can vary based on the composition and amount of wastewater being treated.

EPA recognizes that the characterization of legacy wastewater differs within the layers of a CCR impoundment as it is dewatered and prepared for closure. Therefore, treatment requirements may change as closure continues. Wastewater characteristics also differ across CCR impoundments due to different types of fuels burned at the plant, duration of pond operation, and ash type. The list of treatment technologies identified for legacy wastewater above are all applicable to all legacy wastewaters; however, treatment may require a combination of those technologies (*e.g.,* chemical precipitation and membrane filtration).

In addition, solids dewatering is necessary to dredge CCR materials from the impoundment. Mobile dewatering systems are typically self-contained units on a trailer, allowing for the entire system to be easily moved on-site and off-site. Legacy wastewater from a holding area (*e.g.,* pit, pond, collection tank) is pumped through a filter press to generate a filter cake and water stream. A shaker screen can be added to the treatment train to remove larger particles prior to the filter press. Furthermore, the filter press can be equipped with automated plate shifters to allow solids to drop from the end of the trailer directly into a loader or truck. The resulting wastestream may be further treated to meet any discharge requirements.

## VI. Data Collection Since the 2020 Rule

### *A. Information From the Electric Utility Industry*

1. Data Requests and Responses

In January 2022, EPA requested the following pollution treatment system performance and cost information for coal-fired power plants from three steam electric power companies:

- FGD wastewater installations of the following technologies: thermal technology; membrane filtration technology; paste, solidification, or encapsulation of FGD wastewater brine; electrodialysis; and electrocoagulation.
- Overflow from an MDS, a compact submerged conveyor (CSC), or remote MDS installations, including purge rate and management from remote MDS systems, as well as any pollutant concentration data to characterize the overflow or purge.
- CRL treatment from on-site or off-site testing (full-, pilot-, or laboratory-scale).
- On-site or off-site testing (full-, pilot-, or laboratory-scale) and/or implementation of treatment technologies associated with surface impoundment decanting or dewatering treatment.
- Costs associated with these technologies.

In addition, EPA sent four additional power companies a voluntary request inviting them to provide the same data described above after EPA had met with these companies.

2. Meetings With Individual Utilities

To gather information to support this supplemental proposed rule, EPA met with representatives from four utilities. Two of these utilities reached out to EPA after the announcement of the supplemental rule. EPA contacted the remaining utilities due to their known or potential consideration of membrane filtration. At these meetings, EPA discussed the operation of the utility's coal-fired generating units and the treatment and management of BA transport water, FGD wastewater, legacy wastewater, and CRL since the 2020 rule. EPA learned about updates associated with plant operations and studies that were originally discussed during the 2015 and 2020 rules.

The specific objectives of these meetings were to gather general information about coal-fired power plant operations; pollution prevention and wastewater treatment system operations; ongoing pilot or laboratory scale study information for FGD wastewater treatment; BA system performance, characterization, and quantification of the overflow and purge from remote MDS installations; and treatment technologies and pilot testing associated with CRL and legacy wastewater. EPA used this information to supplement the data collected in support of the 2015 and 2020 rules.

3. Voluntary CRL Sampling

In December 2021, EPA invited eight steam electric power companies to participate in a voluntary program designed to obtain data to supplement the wastewater characterization data set for CRL. EPA requested these data from facilities believed to have constructed new landfills pursuant to the 2015 CCR rule. Six power companies chose to participate in this program.

4. Electric Power Research Institute Voluntary Submission

The Electric Power Research Institute (EPRI) conducts industry-funded studies to evaluate and demonstrate technologies that can potentially remove pollutants from wastestreams or eliminate wastestreams using zero discharge technologies. Following the 2015 rule, EPA reviewed 35 reports published between 2011 and 2018 that EPRI voluntarily provided regarding characteristics of FGD wastewater, FGD wastewater treatment pilot studies, BA transport water characterization, BA handling practices, halogen addition rates, and the effect of halogen additives on FGD wastewater. For this



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supplemental proposed rule, EPRI provided an additional 25 reports generated in the intervening years. EPA used information presented in these reports to inform the development of numeric effluent limitations for FGD wastewater and to update methodologies for estimating costs and pollutant removals associated with candidate treatment technologies.

5. Meetings With Trade Associations

In 2021 and 2022, EPA met with the Edison Electric Institute and the American Public Power Association. These trade associations represent investor-owned utilities and community-owned utilities, respectively. They provided information and perspectives on the current status of many utilities transitioning away from coal.

*B. Notices of Planned Participation*

The 2020 rule required facilities to file a notice of planned participation (NOPP) with their permitting authority no later than October 13, 2021, if the facility wished to participate in the LUEGU subcategory, the permanent cessation of coal combustion subcategory, or in the VIP (*see* 40 CFR 423.19(e), (f), and (h), respectively). While EPA did not require that a copy be provided to the Agency, EPA nevertheless obtained a number of these filings. Some facilities provided EPA a courtesy copy when filing with the relevant permitting authority. The Agency received notice of other filings as part of its standard permit review process when a state permitting authority sent new draft permits or modifications to EPA for review. EPA also asked some states for NOPPs after those states asked EPA questions about the process or initiated discussions about specific plants. Environmental groups who had been tracking NOPPs at specific plants and states also shared with EPA the information they had collected.

EPA is currently aware of NOPPs covering 90 EGUs at 38 plants. Of these, four EGUs (at two plants) have requested participation in the LUEGU subcategory, an additional 12 EGUs (at four plants) have requested participation in the 2020 rule VIP, and the remaining 74 EGUs (at 33 plants) have requested participation in the permanent cessation of coal combustion subcategory.[19] EPA cautions that these counts are not a comprehensive picture of what facilities' plans are for two reasons. First, EPA was unable to obtain information for all plants and states, and thus solicits comment on whether the public is aware of additional NOPPs that are not yet known to the Agency. Second, even where a facility has filed a NOPP, it still retains the flexibility under the transfer provisions of 40 CFR 423.13(o) to transfer between subcategories, or between a subcategory and the 2020 VIP provisions until 2023 or 2025 (depending on the transfer desired). EPA therefore solicits comment on additional information that would inform the Agency's understanding of facilities' plans under the 2020 rule. For further detail, the NOPPs EPA is aware of have been placed in the docket along with a memo summarizing the information and providing record index numbers for locating each facility, entitled *Changes to Industry Profile for Coal-Fired Generating Units for the Steam Electric Effluent Guidelines Proposed Rule* (SE10241).

*C. Information From Technology Vendors and Engineering, Procurement, and Construction Firms*

EPA gathered data on the availability and effectiveness of FGD wastewater, BA handling, CRL, and pond dewatering operations and wastewater treatment technologies in the industry from technology vendors and Engineering, Procurement, and Construction firms through presentations, conferences, meetings, and email and phone contacts. These collected data informed the development of the technology costs and pollutant removal estimates for FGD wastewater, BA transport water, CRL, and legacy wastewater.

*D. Other Data Sources*

EPA gathered information on steam electric generating facilities from the Department of Energy's (DOE's) Energy Information Administration (EIA) Forms EIA–860 (Annual Electric Generator Report) and EIA–923 (Power Plant Operations Report). EPA used the 2019 and 2020 data to update the industry profile, including commissioning dates, energy sources, capacity, net generation, operating statuses, planned retirement dates, ownership, and pollution controls at the EGUs.

EPA conducted literature and internet searches to gather information on FGD wastewater treatment technologies, including information on pilot studies, applications in the steam electric power generating industry, and implementation costs and timelines. EPA also used internet searches to identify or confirm reports of planned facility plant and EGU retirements and reports of planned unit conversions to dry or closed-loop recycle ash handling systems. EPA used this information to inform the industry profile and identify process modifications occurring in the industry.

## VII. Proposed Regulation

*A. Description of the Options*

This proposal evaluates four regulatory options and identifies one preferred option (Option 3), as shown in Table VII–1 of this preamble. All options include the same technology basis for CRL (chemical precipitation) and legacy wastewater (best professional judgment) while incrementally increasing controls on FGD wastewater, BA transport water, or both. Each successive option from Option 1 to 4 would achieve a greater reduction in wastewater pollutant discharges. Each subcategorization is described further in Section VII.C of this preamble. In addition to some specific requests for comment included throughout this proposal, EPA solicits comment on all aspects of this proposal, including the information, data, and assumptions EPA relied upon to develop the four regulatory options, as well as the proposed BAT, effluent limitations, and alternate approaches included in this proposal.

1. FGD Wastewater

Under Option 1, EPA proposes to eliminate the BAT and PSES subcategorizations for high FGD flow facilities and LUEGUs. Option 1 would establish the same mercury, arsenic, selenium, and nitrogen limitations applicable to the industrial category based on chemical precipitation, followed by low hydraulic residence time biological treatment and ultrafiltration. Under Options 2 and 3, EPA proposes to eliminate the BAT and PSES subcategorizations for high FGD flow facilities and LUEGUs and further proposes to require zero discharge of FGD wastewater based on chemical precipitation followed by membrane filtration with 100 percent recycle of the permeate. These proposed options would also create a subcategory for early adopters that have already installed compliant biological treatment systems and would retire no later than December 31, 2032. Under Option 4, EPA proposes to establish an industrywide zero-discharge requirement without establishing an early adopter subcategory. Note that for all four options EPA proposes to retain the subcategory for EGUs permanently ceasing coal combustion by 2028.

[19] Plant Scherer filed a permanent cessation of coal combustion NOPP for two EGUs and a 2020 rule VIP NOPP for the remaining two EGUs; thus, the plant count for the three groupings does not equal 38.



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2. BA Transport Water

Under Options 1 and 2, EPA proposes to eliminate the BAT and PSES subcategorization for LUEGUs. Options 1 and 2 would establish the same volumetric purge limitation applicable to the industrial category based on high recycle rate systems. Under Option 3, EPA proposes zero discharge based on dry handling or closed-loop systems. This proposed option would also create a subcategory for early adopters that have already installed a compliant high recycle rate system and would retire no later than December 31, 2032. Under Option 4, EPA proposes to establish an industrywide zero-discharge requirement without establishing an early adopter subcategory. For all four options, EPA proposes to retain the subcategory for EGUs permanently ceasing coal combustion by 2028.

3. CRL

Under all four options, EPA proposes to establish BAT limitations and PSES for mercury and arsenic based on chemical precipitation treatment.

4. Legacy Wastewater

Under all four options, EPA proposes not to specify a nationwide technology basis for BAT/PSES applicable to legacy wastewater at this time, but rather proposes that such limitations are to be derived on a site-specific basis by the permitting authorities, using their BPJ. EPA does solicit comment on other options, as discussed below.

TABLE VII–1—MAIN REGULATORY PROPOSED OPTIONS

| Wastestream | Subcategory | Technology Basis for the BAT/PSES Regulatory Options | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 (Preferred) | 4 |
| FGD wastewater | N/A | Chemical precipitation + biological treatment + ultrafiltration. | Chemical precipitation + membrane filtration. | Chemical precipitation + membrane filtration. | Chemical precipitation + membrane filtration. |
| | High FGD flow facilities/LUEGUs. | NS | NS | NS | NS. |
| | EGUs permanently ceasing coal combustion by 2028. | Surface impoundments. | Surface impoundments. | Surface impoundments. | Surface impoundments. |
| | Early adopters permanently ceasing coal combustion by 2032. | NS | Chemical precipitation + biological treatment + ultrafiltration. | Chemical precipitation + biological treatment + ultrafiltration. | NS. |
| BA transport water | N/A | High recycle rate systems. | High recycle rate systems. | Dry handling or closed-loop systems. | Dry handling or closed-loop systems. |
| | LUEGUs | NS | NS | NS | NS. |
| | EGUs permanently ceasing coal combustion by 2028. | Surface impoundments. | Surface impoundments. | Surface impoundments. | Surface impoundments. |
| | Early adopters permanently ceasing coal combustion by 2032. | NS | NS | High recycle rate systems. | NS. |
| CRL | N/A | Chemical precipitation | Chemical precipitation | Chemical precipitation | Chemical precipitation. |
| Legacy wastewater | N/A | Best professional judgment. | Best professional judgment. | Best professional judgment. | Best professional judgment. |

N/A = Not applicable.
NS = Not subcategorized.
Note: The table above does not present existing subcategories included in the 2015 rule or the 2020 VIP for FGD wastewater. EPA is not proposing any changes to the existing 2015 rule subcategorization of oil-fired units, units with a nameplate capacity of 50 MW or less, or the 2020 VIP.

*B. Rationale for the Proposed Rule*

In light of the criteria and factors specified in CWA sections 301(b)(2)(A) and 304(b)(2)(B) (*see* Section IV of this preamble, above), EPA proposes to establish BAT effluent limitations based on the technologies described in Option 3.[20]

1. FGD Wastewater

EPA is proposing chemical precipitation, followed by membrane filtration, as the technology basis for establishing BAT limitations to control pollutants discharged in FGD wastewater. After considering the factors specified in CWA section 304(b)(2)(B), EPA proposes to find that this technology is technologically available, economically achievable, and has acceptable non-water quality environmental impacts. More specifically, the technology basis for BAT would include chemical precipitation to remove suspended solids and scaling compounds prior to treatment with one or more stages of nanofiltration, electrodialysis reversal (EDR), RO, and/or forward osmosis. The permeate from the final stage of treatment would then be recycled back into the plant either as FGD makeup water or boiler makeup water.[21]

In the subsection immediately below, EPA discusses its rationale for proposing membrane filtration as BAT for the control of FGD wastewater. In the following subsection, EPA discusses why it is not proposing as its main option other zero discharge technologies as BAT but is taking comment on such technologies. In the final subsection, EPA discusses why it is not proposing a less stringent technology as BAT.

[20] EPA proposes to include language in the final rule that makes clear that if any provisions of the final rule are reviewed and vacated by a court, it is EPA's intent that as many portions of the rule remain in effect as possible.

[21] The 2020 rule finalized an exemption from the definition of FGD wastewater applicable to ''treated FGD wastewater permeate or distillate used as boiler makeup water.''



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a. Membrane Filtration

*Availability of membrane filtration.* EPA is proposing to determine that membrane filtration is available for use by the steam electric industry to control discharges of FGD wastewater. Such a finding is consistent with the technology forcing nature of BAT as described in the legislative history and legal precedents discussing this provision. ''In setting BAT, EPA uses not the average plant, but the optimally operating plant, the pilot plant which acts as a beacon to show what is possible.'' (*Kennecott* v. *EPA,* 780 F.2d 445, 448 (4th Cir. 1985) (citing *A Legislative History of the Water Pollution Control Act Amendments of 1972,* 93d Cong., 1st Sess. (Comm. Print 1973), at 798). BAT is supposed to reflect the highest performance in the industry and may reflect a higher level of performance than is currently being achieved based on technology transferred from a different subcategory or category, bench scale or pilot plant studies, or foreign plants. *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1006; *Am. Paper Inst.* v. *Train,* 543 F.2d 328, 353 (D.C. Cir. 1976); *Am. Frozen Food Inst.* v. *Train,* 539 F.2d 107, 132 (D.C. Cir. 1976). BAT may be based upon process changes or internal controls, even when these technologies are not common industry practice. *See Am. Frozen Foods,* 539 F.2d at 132, 140; *Reynolds Metals Co.* v. *EPA,* 760 F.2d 549, 562 (4th Cir. 1985); *California & Hawaiian Sugar Co.* v. *EPA,* 553 F.2d 280, 285–88 (2nd Cir. 1977). As recently reiterated by the U.S. Court of Appeals for the Fifth Circuit, ''Under our precedent, a technological process can be deemed available for BAT purposes even if it is not in use at all, or if it is used in unrelated industries. Such an outcome is consistent with Congress'[s] intent to push pollution control technology.'' *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1031 (citation and internal quotations omitted).

As further discussed below, EPA is proposing to base its determination that membrane filtration is available for control of pollutants found in FGD wastewater on the numerous full-scale foreign installations of membrane filtration to treat FGD wastewater, the large number of successful domestic and international pilot tests of membrane filtration on FGD wastewater, successful use of membrane filtration on other steam electric wastestreams, and the use of membrane filtration on wastestreams in a many different industries besides the steam electric industry.

In the 2020 rule, EPA determined that membrane filtration was not available to control FGD wastewater industrywide, primarily due to the lack of a full-scale membrane filtration system in use to control FGD wastewater discharges at a U.S. facility. There was also discussion of possible uncertainties or data gaps in the record regarding foreign plants, pilot tests, or use of membrane filtration on other wastestreams. When EPA promulgated the 2020 rule, however, the Agency was aware of membrane filtration being successfully used on FGD wastewater at 12 foreign plants, on FGD wastewater in 20 domestic pilots, and on several wastestreams with characteristics similar to those of FGD wastewater both within the steam electric sector and in other industries. The language and intent of the CWA, repeatedly confirmed by Federal appellate courts, demonstrates that Congress intended that BAT reflect the best performing plant (*see, e.g., Kennecott* v. *EPA,* 780 F.2d. at 447; *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1018). Accordingly, some might argue that the amount of information in the 2020 record was sufficient to support a finding of membrane filtration as BAT for control of FGD wastewater discharges. Based on EPA's current record, which contains additional information regarding the application of membrane filtration to FGD wastewater and other wastestreams inside and outside the steam electric industry,[22] the weight of the evidence supports the Agency's proposed conclusion that membrane filtration is available in the industry to control FGD wastewater discharges, notwithstanding the uncertainties raised in the 2020 rule. Agencies have inherent authority to reconsider past decisions and to revise, replace, or repeal a decision to the extent permitted by law and supported by a reasoned explanation. *FCC* v. *Fox Television Stations, Inc.,* 556 U.S. 502, 515 (2009); *Motor Vehicle Mfrs. Ass'n* v. *State Farm Mutual Auto. Ins. Co.,* 463 U.S. 29, 42 (1983). Thus, for the following reasons, EPA proposes coming to a different conclusion regarding the availability of membrane filtration than in it did in the 2020 rule.[23]

*International installations.* At the time of the 2020 rule, the Agency cited 12 foreign installations of membrane filtration on FGD wastewater.[24] These systems began operating as early as 2015, and all of the systems were designed to operate as zero discharge systems.[25] Since the 2020 rule, EPA has become aware of additional information about these international installations that supports its proposed determination that membrane filtration is available for control of FGD wastewater discharges. In particular, the Agency has learned that certain Chinese facilities with membrane installations have successfully achieved zero discharge of FGD wastewater, in part by adjusting the ratios and dosages of the specific chemicals used in their chemical precipitation pretreatment systems.[26] EPA also has learned that certain Chinese plants with later installations did not need to pilot membrane filtration systems before successfully installing and operating them at full scale. The operating information from the previous installations was sufficient to successfully install a full-scale membrane system without the need for an intermediate pilot.[27]

In the 2020 rule, EPA stated that there were too many unknowns about the foreign installations to support a finding of availability, including not knowing enough about their configurations, operations, performance, or long-term maintenance. These American-made systems have continued to operate since the 2020 rule, with the oldest now

[22] Caselaw supports that EPA may base BAT on technologies used in other industries. *See, e.g., Kennecott* v. *EPA,* 780 F.2d at 453 (''Congress envisioned the scanning of broader horizons and asked EPA to survey related industries and current research to find technologies which might be used to decrease the discharge of pollutants.'').

[23] EPA also recognizes that, while it may change policies based upon a reasoned explanation, where a prior policy has engendered serious reliance interests, those interests must be taken into account. *FCC* v. *Fox Television Stations, Inc.,* 556 U.S. at 515 (citation omitted). EPA has taken reliance interests into account in this rulemaking, as is clear from EPA's proposal in Section VII.C.4 of this preamble, below, to create a new subcategory for early adopters who relied on certain of EPA's past determinations. EPA also notes that no NPDES permittee has certainty of its limitations beyond its 5-year NPDES permit term, as reissued permits must incorporate any newly promulgated technology-based limitations as well as potentially more stringent limitations necessary to achieve water quality standards. *See* 40 CFR 122.44(a) & (d).

[24] ERG, 2020. Technologies for the Treatment of Flue Gas Desulfurization Wastewater. DCN SE09218.; ERG, 2020. Notes from Call with DuPont. DCN SE08618.; Beijing Jingneng Power. 20177. Beijing Jingneng Power Company, Ltd. Announcement on Unit No. 1 of the Hbei Shuoshou Jingyuan Thermal Power Co., Ltd. Passing Through the 168-hours Trial Operation. (13 November). DCN SE08624.; Broglio, Robert. 2019. Doosan. Vendor FGD Wastewater Treatment Details—Doosan. (15 July). DCN SE07107.; Lenntech. 2020. Lenntech Water Treatment Solutions. Flue Gas Desulfurization Treatment. DCN SE08622.; Nanostone. 2019. China Huadian Jiangsu Power Jurong Power Plant FGD Wastewater Zero Liquid Discharge Project was Awarded the Engineering Star Award. (27 June). DCN SE08628.

[25] *Technologies for the Treatment of Flue Gas Desulfurization Wastewater, Coal Combustion Residual Leachate, and Pond Dewatering* (SE10281).

[26] SE06915.

[27] SE08618.



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operating for seven years. This continued operation suggests that EPA's concerns in 2020 may have been overstated. Additional data on foreign system configurations and operations have also enhanced the Agency's understanding of these systems.[28] Particularly, EPA was able to learn more about the issues with pretreatment identified at the pilot stage for one of the first Chinese installations. These issues were a result of the FGD wastewater's high suspended solids and high hardness. While these issues were identified at the outset of pilot testing, they were sufficiently resolved through adjustment of the chemical precipitation pretreatment process, leading the facility to install the system at full scale. For later installations at different sites, this Chinese utility ceased conducting pilot tests since appropriate pretreatment steps had already been identified.

In the 2020 rule, EPA also stated that there was not enough information to know if the foreign installations could continually operate as zero discharge systems or whether there would be some periods during which discharges occur. EPA notes that two additional years of zero discharge operation for these foreign plants have occurred since the 2020 rule, which supports a finding that continuous zero discharge operations are achievable. As discussed in Section XIV of this preamble, while EPA proposes zero discharge of pollutants in FGD wastewater, the Agency solicits comment on alternative membrane filtration-based BAT limitations if comments demonstrate that a regular or intermittent discharge is necessary for some plants. For the reasons discussed above, the installation and operation of membrane filtration to treat FGD wastewater abroad supports the proposed BAT basis of membrane filtration for FGD wastewater discharges.

*Pilot applications.* Although EPA has sufficient information to propose that membrane filtration is available based on foreign installations alone, pilot applications also support the availability of membrane filtration for control of FGD wastewater discharges. In the 2020 rule record, the Agency cited 20 pilot applications of membrane filtration on FGD wastewater (19 domestic and one international).[29] While EPA stated that there were data gaps associated with the pilot studies that prevented a finding that membrane filtration is available, these gaps primarily related to the development of numeric limitations, and EPA nevertheless established limitations based on membrane filtration technology in the VIP. Furthermore, the record showed that membrane filtration pilots in the United States have demonstrated success removing pollutants from FGD wastewater under a number of pretreatment settings, whether performed without chemical precipitation pretreatment, with chemical precipitation pretreatment, or following biological treatment.[30] While specifics of these reports are claimed as CBI, EPA notes that the authors of several pilot test reports gave glowing reviews of the technology and detailed a number of advantages that membrane filtration offered versus biological treatment.

One of these reports, *Performance Evaluation of a Vibratory Shear Enhanced Processing Membrane System for FGD Wastewater Treatment,* which was published in 2014 but recently made publicly available, found that the piloted membrane filtration technology reliably removed the vast majority of pollutants in FGD wastewater. This pilot of the Vibratory Shear Enhanced Processing/Spiral Reverse Osmosis (VSEP/RO) system from New Logic Research, Inc. was performed at the Water Research Center at Georgia Power's Plant Bowen. The pilot included operations in both single pass mode (*i.e.,* continuous operations) and batch mode (focused on maximizing water recovery) on moderate TDS FGD wastewater and high TDS VSEP/RO concentrate. As explained in the report, ''The first stage, VSEP pilot unit, removed approximately 94% TDS, while the second stage, Spiral RO pilot unit, removed an additional 5.8% TDS, yielding an overall TDS removal efficiency of 99.8%.'' Furthermore, the system successfully removed pollutants even when the pollutant concentrations were increased from an average of approximately 15,000 mg/L TDS to an average of approximately 54,000 mg/L TDS, demonstrating the versatility of the system across a range of concentrations. Finally, the system continued operation without decreased performance due to scaling/fouling. ''In both modes of operation (single-pass and batch concentration), no irreversible membrane fouling, no irregular transmembrane pressure (TMP) increase was observed throughout the project.'' This appeared to result from a combination of the acid/base cleanings and the VSEP membrane vibration design/mechanism. This pilot supports that membrane filtration systems can successfully remove pollutants under a variety of TDS concentrations and scaling potentials found in FGD wastewater.

Since the 2020 rule, EPA has also become aware of new information on three additional domestic pilot applications of membrane filtration on FGD wastewater. Each of these pilots was performed with a different technology and demonstrated successful removal of pollutants in FGD wastewater and recovery of usable permeate. In particular, the first-of-its-kind domestic pilot of an EDR pilot plant for FGD wastewater indicates that treatment with membrane filtration has continued to advance and become more available. This pilot is detailed in EPRI (2020), which found that ''The Flex EDR Selective pilot plant reliably operated for 61 days, 24/7, including weekends and unattended overnights.'' Other key findings included an average 93 percent water recovery, 98 percent uptime of continuous operations (more than 1440 hours), selective removal of chloride, the elimination of the need for soda ash softening, ''demonstrated versatility to treat wastewater of different concentrations and water chemistries with the same treatment plant,'' and the potential for cost savings when compared to comparable treatment systems. Thus, the weight of evidence available from a growing number of pilot studies supports the Agency's proposed conclusion that membrane filtration is BAT for FGD wastewater discharges.

*Application to other wastestreams.* As EPA explained in the 2020 rule, membrane filtration is used in full-scale applications to other wastestreams in the steam electric power sector and other industrial sectors. The domestic steam electric power sector regularly uses membrane filtration for boiler makeup water,[31] cooling tower

[28] SE10245.

[29] One of the systems EPA was aware of for the 2020 rule was a long-term pilot project at one facility, which is a commercial-scale system that may have sufficient capacity to treat the full FGD wastestream moving forward. Nevertheless, because the company is still making changes to the operation of the plant's FGD system, has also pilot tested a biological treatment system, and has continued to leave the possibility of biological treatment for compliance open, EPA defers to the company's characterization of this system as a pilot. Thus, it is not considered a domestic, full-scale installation.

[30] In one case, a utility conducted a successful membrane pilot even when there were significant failures in the performance of upstream pretreatment systems leading to excessive TSS passthrough to the membrane system.

[31] EPRI (Electric Power Research Institute). 2015. *State of Knowledge: Power Plant Wastewater Treatment—Membrane Technologies.* August. 3002002143.



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blowdown,[32] and ash transport water.[33] Other industrial sectors with full-scale membrane filtration applications include the textiles,[34] chemical manufacturing,[35] mining,[36] agriculture, oil and gas extraction,[37] food and beverage,[38] microelectronics/semiconductors,[39] landfills,[40] and automotive industries.[41]

In the 2020 rule, EPA stated that some of these other applications did not show that membrane filtration was available for use on FGD wastewater by focusing on the differences between specific characteristics of these individual wastewaters and FGD wastewater. Information in the 2020 record and the current record, however, indicates that there are many similarities between FGD and the non-FGD wastestreams where membranes have been utilized. In the 2020 rule record, EPA discussed that cooling tower blowdown at steam electric plants and desalination in oil and gas extraction were examples where membrane filtration was used in full-scale applications for treating high TDS wastewaters, a characteristic of FGD wastewater (85 FR at 64664–64665, October 13, 2020). The 2020 rule record also established that mining wastewaters, which are high in gypsum scaling potential (another characteristic of FGD wastewater), have been successfully treated with membrane filtration applications. Finally, the 2020 rule record established that despite the high variability in ash transport water (a third characteristic of FGD wastewater), it was successfully treated with membrane filtration. This information indicates that membrane filtration can operate effectively on wastestreams that contain several characteristics of FGD wastewater, including high TDS, high gypsum scaling potential, and high variability.[42] Thus, based on the information gathered in both EPA's prior and current records, the utilization of membrane technology on other wastestreams supports the Agency's proposed conclusion that membrane filtration technology is BAT for FGD wastewater discharges.

For all the foregoing reasons, EPA proposes to find that membrane filtration is technologically available for the control of discharges in FGD wastewater. Moreover, membrane filtration would make reasonable further progress toward the Act's goal of eliminating the discharge of all pollutants because it would result in zero discharge of FGD wastewater from steam electric power plants.

*Economic achievability of membrane filtration.* EPA proposes to find that the costs of membrane filtration for control of FGD wastewater discharges are economically achievable. Under the CWA, BAT limitations must be economically achievable. Courts have interpreted that requirement as a test of whether the regulations can be ''reasonably borne'' by the industry as a whole. *Chem. Mfrs. Ass'n* v. *EPA,* 870 F.2d 177, 262 (5th Cir. 1989); *BP Exploration & Oil* v. *EPA,* 66 F.3d 784, 799–800 (6th Cir. 1996); *see also Nat'l Wildlife Fed'n* v. *EPA,* 286 F.3d 554, 570 (D.C. Cir. 2002); *CPC Int'l Inc.* v. *Train,* 540 F.2d 1329, 1341–42 (8th Cir. 1976), *cert. denied,* 430 U.S. 966 (1977). ''Congress clearly understood that achieving the CWA's goal of eliminating all discharges would cause 'some disruption in our economy,' including plant closures and job losses.'' *Chem. Mfrs. Ass'n* v. *EPA,* 870 F.2d at 252 (citations omitted); *see also id.* at 252 n.337 (reviewing cases in which courts have upheld EPA's regulations that projected up to 50 percent closure rates). Although the 2020 rule cited the increased cost of membrane filtration as compared to the selected technology basis as a reason for rejecting membrane filtration,[43] the Agency did not go so far as to find that the costs of membrane filtration were not economically achievable at that time. EPA proposes to find that the costs of membrane filtration for FGD wastewater are economically achievable for the industry as a whole, as discussed further below and in Sections VII.F and VIII of this preamble.

*Non-water quality environmental impacts of membrane filtration.* EPA proposes to find that the non-water quality environmental impacts of membrane filtration are acceptable. For further discussion of these impacts, see Sections VII.G and X of this preamble. There was one non-water quality environmental impact that the 2020 rule found was unacceptable. In that rule, EPA expressed concern that use of membrane filtration would unacceptably limit the beneficial use of FA. The 2020 rule record and the current record demonstrate that the beneficial use of FA as an admixture or to replace Portland cement in concrete provides a substantial environmental benefit. As such, the potential that using FA to help dispose of brine from membrane filtration would limit this beneficial use continues to be potentially the most substantial non-water quality environmental impact when considering whether membrane filtration is BAT. Nevertheless, in light of the facts and analyses described in the following paragraphs, EPA proposes to find that these non-water quality environmental impacts are acceptable, most importantly because EPA's record indicates that there is sufficient FA to accommodate both FGD brine encapsulation needs following membrane filtration of FGD wastewater and the beneficial use market.

At the outset, EPA notes that the 2020 rule record discusses two uses of FA: FA fixation and brine encapsulation. FA fixation occurs when a facility conditions its dry FA with FGD wastewater rather than fresh makeup water.[44] The use of FA fixation prior to the 2020 rule is partly due to the very low costs of FA conditioning compared to other wastewater treatment technologies for FGD wastewater, as well as the potential to eliminate the discharge of FGD wastewater. The 2020 rule record also included discussion of brine encapsulation. Brine encapsulation is the process of mixing raw FGD wastewater or concentrated

[32] *See, e.g.,* 5 Daniels, D.G. 2015. *Winning the Cooling Tower Trifecta: Controlling Corrosion, Scale, and Microbiological Fouling.* Power Magazine. August 21. Available online at: *www.powermag.com/winning-the-cooling-towertrifecta-controlling-corrosion-scale-andaqmicrobiological-fouling/* (DCN SE09088).

[33] *See, e.g., www.ge.com/in/sites/www.ge.com.in/files/GE_solves_ash%20pond_capacity_issue.pdf* (DCN SE09090).

[34] ERG. 2020 Final Notes from Call with DuPont. DCN SE08618.

[35] ERG. 2020. Final Notes from Call with DuPont. DCN SE08618.

[36] ERG. 2019. Final Notes from Meeting with Pall Water. (5 March). EPA–HQ–OW–2009–0819–7613; Wolkersdorfer, Christian et al. 2015. Intelligent mine water treatment—recent international developments. (21 July). DCN SE08581; U.S. EPA. 2014. Office of Superfund and Remediation and Technology Innovation. Reference Guide to Treatment Technologies for Mining-Influenced Water. EPA 542–R–14–001. (March). DCN SE08582.

[37] CH2M Hill. 2010. Review of Available Technologies for the Removal of Selenium from Water. (June). DCN SE08583.

[38] U.S. EPA. 2022. Notes from Meeting with BKT—April 9, 2021. DCN SE010253.

[39] U.S. EPA. 2022. Notes from Meeting with BKT—April 9, 2021. DCN SE010253.

[40] ERG. 2019. Sanitized_Saltworks Vendor Meeting Notes—Final. DCN SE07089.

[41] U.S. EPA. 2022. Notes from Meeting with ProChem—April 9, 2021. DCN SE10254.

[42] Use of membrane filtration has since expanded into additional applications, treating wastewaters and industries beyond those where it was used at the time of the 2020 rule (*e.g.,* the food and beverage, microelectronics/semiconductors, landfills, and automotive industries).

[43] While the relative costs of technologies differ from plant to plant, new information obtained during the 2022 information collection confirms what was shown in the 2020 record: that, in some cases, technologies such as membrane filtration may be less costly than biological treatment at individual plants even where, on average, they would be more expensive to the industry as a whole.

[44] Conditioning is required to avoid air dispersion of the fine FA particulates.



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FGD wastewater brine with FA and lime, which results in pozzolanic reactions that bind additional pollutants into the final solid matrix. Since the 2020 rule, additional facilities have evaluated FA fixation with FGD wastewater and/or encapsulation of FGD wastewater using FA and lime. In at least one instance, fixation/encapsulation was less costly than biological treatment. Thus, even without a new regulation establishing BAT limitations based on membrane filtration, the record demonstrates that implementation of the baseline 2020 rule has resulted in the use of some FA for fixation or encapsulation.

While FA fixation still may be an option for brine management, EPA evaluated the option most discussed in the record: brine encapsulation. Since the question in evaluating the impact of brine encapsulation is not whether the FA needed for these processes will be disposed of, but to what extent additional disposal curtails the FA available for beneficial use, EPA conducted an analysis of FA availability entitled *2021 Steam Electric Supplemental Proposed Rule: Fly Ash Availability* (SE10242). This analysis shows that the amount of FA needed to dispose of membrane filtration's byproduct would not have an unacceptable impact on the amount of FA that is used for beneficial purposes. In this analysis, consistent with EPA's costing methodology, the Agency conservatively assumed that all facilities generate brine from a single pass of a membrane filtration system, which is then encapsulated with FA and lime.[45] In other words, EPA conservatively assumed no further brine concentration (*e.g.,* additional membrane filtration, or thermal evaporation) would be performed that would further decrease the amount of FA needed for encapsulation.

The results of EPA's conservative FA availability analysis support the finding that there is sufficient FA for the majority of the 22 plants that would be expected to make treatment upgrades to meet the proposed limitations. Based on EPA's analysis of 2019 and 2020 EIA data, 20 of these 22 power plants that would be expected to install membrane filtration under proposed Option 3 have enough FA for encapsulation before accounting for reported FA sales. For the two remaining plants, EPA estimates there would be a combined annual FA deficiency of approximately 240,000 tons. After accounting for reported FA sales, and assuming these sales continue, EPA estimates that an additional four power plants may not have enough FA available for encapsulation—a total of six plants with a combined annual FA deficiency of approximately 750,000 tons (or approximately one percent of all fly ash generated). In light of the relatively small on-site FA deficiency estimated using conservative assumptions and, as discussed more fully below, the potential for plants to use off-site FA or additional lime for their brine encapsulation needs or available brine management alternatives that do not rely on FA or use less FA, EPA proposes that its estimate of on-site FA that may no longer be available for beneficial use after implementation of this rule does not rise to the level of an unacceptable non-water quality environmental impact.

The 750,000 ton per year shortfall of FA described above is likely an overestimate for several reasons. First, based on the 2020 EIA data, coal-fired power plants reported more than 30 million tons of FA generated annually. While there are increasing FA sales reported each year, EPA identified more than 100 coal-fired power plants generating over 9.6 million tons of unsold FA that could be redirected from disposal towards either encapsulation or other beneficial uses.[46] Thus, EPA estimates that there is enough FA to accommodate both FGD brine encapsulation needs and the beneficial use market with millions of tons still requiring disposal. In the 2020 rule record, GenOn's plans to install membrane filtration at certain facilities did not include use of FA from those facilities. Instead, GenOn had plans to send the brine offsite to be mixed with other FA and lime for disposal and continued to seek options for beneficial use of the brine.[47] The concepts of use of off-site FA or beneficial use of brine are not unique to GenOn. With respect to alternate FA, the 2022 World of Coal Ash conference included 10 sessions with abstracts discussing the harvesting and beneficiation of previously disposed ash.[48] This further supports that, after accounting for FA availability across the entire industry, the non-water quality environmental impacts of potential FA disposal associated with membrane filtration are acceptable.

Second, the Agency notes that multiple alternatives exist for handling the resulting brine that do not involve FA and thus would have no impact on the beneficial use of FA in other settings. EPA evaluated alternative scenarios including disposal of brine in a deep injection well and crystallization to a salt for disposal. With respect to disposal in a deep injection well, EPA has been encouraging efforts for water reuse rather than deep well injection, particularly in arid western climates. Most of the facilities in question here, however, are located in the Midwest and Southern U.S., places where water reuse may still be important when feasible, but not to the level that EPA would find injection to be unacceptable. With respect to crystallization and disposal of the resultant salt, none of the facilities that currently generates brine as part of a zero discharge system elects to encapsulate and dispose of that brine.[49] Rather, these facilities send the concentrated brine to a crystallizer, and these resulting salt crystals can then be disposed of without the use of FA. The costs and non-water quality environmental impacts of these alternatives are presented in *Alternative Brine Management Methodology* (SE10243). The 2015 rule record found crystallization to have acceptable non-water quality environmental impacts. Based on this most current analysis along with the 2015 record, EPA proposes to find that these alternative brine management strategies have acceptable non-water quality environmental impacts and that, while these costs are higher, they would be economically achievable.

Third, EPA also notes that the six plants with potentially insufficient FA may still be able to sell their FA if the brine encapsulation were performed with additional lime use. EPA notes that extraction, processing, and transportation associated with additional lime use would result in some additional air emissions, but that these emissions would be less than those associated with Portland cement, the material that FA replaces in its most environmentally beneficial use.

Fourth, EPA's estimates regarding non-water quality environmental impacts associated with membrane filtration's byproduct are likely conservative (an overestimate) because, even where encapsulation will be the

[45] While EPA's costs assume a polishing stage RO, the brine from that system in returned to the first stage system.

[46] EPA also notes that the 2020 rule record failed to acknowledge that both the American Coal Ash Association and EPA have historically considered waste stabilization and solidification as a category of beneficial use. *See, e.g., www.acaa-usa.org/wp-content/uploads/coal-combustion-products-use/ACAA-Brochure-Web.pdf.*

[47] Notes from Call with GenOn (SE08614).

[48] Session abstracts are available online at: *www.woca2022.conferencespot.org/event-data/activity.*

[49] While these systems are thermal systems rather than membrane systems, the brine generated would not differ substantially in its ultimate characteristics.



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ultimate brine management scenario, further concentration of the brine is not only possible, but probable for at least some facilities. For example, one utility evaluating 2020 rule VIP-compliant systems for a specific facility discussed how it would send the membrane reject brine to a thermal system to further reduce the volume of FGD brine to be encapsulated. This process would result in less demand for FA due to the decreased volume of brine.

Finally, the 2020 record indicated that the management of FGD brine could actually lead to new beneficial uses. At least one Chinese plant was taking its brine down to salts and then selling its salts for an industrial use.[50] Where companies are ultimately able to beneficially use some of the brine in lieu of disposal, this would be a positive non-water quality environmental impact. Thus, both ongoing evaluation and historical practice indicate EPA's assumptions regarding FA use to encapsulate FGD brine is likely a conservative estimate of the amount of ash that will be diverted from beneficial use to disposal. All of the above information supports EPA's proposed finding that the non-water quality environmental impacts of membrane filtration are acceptable.

b. Other Zero Discharge Technologies

For this proposal, EPA evaluated other zero discharge technologies that could also eliminate the discharge of FGD wastewater. However, EPA is not relying upon them as a basis for proposed BAT limitations because they achieve the same pollutant reductions as the proposed BAT technology basis (membrane filtration) but at a higher cost. Nevertheless, EPA solicits comment on whether the Agency should determine in a final rule that any one or more of these technologies constitutes an additional BAT technology basis for controlling pollutants discharged in FGD wastewater in addition to membrane technology, or alternatively, in place of membrane technology.

Currently, 36 coal-fired power plants in the United States operate wet FGD systems and manage their wastewater to achieve zero discharge.[51] These plants achieve zero discharge using evaporation ponds, recycling of FGD wastewater, ash fixation, thermal systems (*e.g.,* falling film evaporators), or SDEs. Since 2009, approximately 15 additional plants that also operated wet FGD systems and achieved zero discharge of FGD wastewater have retired or refueled such that the FGD wastewater has been eliminated. While some of these systems (evaporation ponds, fixation, and recycling) may not be available at every single site,[52] the number of thermal and SDE systems both domestically and internationally in use on FGD wastewater demonstrates that they are commercially available, and thus potentially technologically available, as technologies for treating FGD wastewater to meet zero-discharge limitations.[53] Specifically, at least some steam electric power plants have used the traditional thermal systems [54] and SDEs [55] to achieve zero discharge of FGD wastewater domestically and internationally for years, and several recent electric utility reports acknowledge this fact.[56] [57] [58] [59] EPA has separately evaluated the costs of thermal and SDE systems. Costs per facility have decreased over time, and due to retirements and fuel conversions, total costs have decreased substantially. Although EPA has not estimated potential closures associated with these technologies using the same model it has for supporting the economic achievability of Option 3, as discussed more in Section VIII of this preamble below, EPA does not expect the costs associated with these technologies to have a significant impact on industry closures. In that case, the costs of these technologies, although higher than the costs estimated for industrywide membrane filtration,[60] would be reasonable for the category as whole, and thus economically achievable.[61] [62] Furthermore, consistent with the findings of the 2015 rule, EPA proposes to find no unacceptable non-water quality environmental impacts from operation of thermal systems and proposes that SDEs have similarly acceptable non-water quality environmental impacts.[63]

EPA solicits comment on whether the Agency should identify, in any final rule, one or more of the technologies of evaporation ponds, recycling of FGD wastewater, ash fixation, thermal systems (*e.g.,* falling film evaporators), or SDEs as a BAT technology basis for control of FGD wastewater discharges, in addition to membrane filtration technology. EPA solicits comment on whether such additional BAT basis or bases would be technologically available and economically achievable, and whether they would have acceptable non-water quality environmental impacts. EPA also solicits comment on whether any one or more of these alternative zero discharge technologies should be the BAT technology basis for control of FGD wastewater discharges in lieu of chemical precipitation plus membrane filtration.

c. EPA Proposes To Reject as BAT Less Stringent Technologies Than Membrane Filtration

Except for the early adopter subcategory discussed in Section VII.C.4 of this preamble, EPA is not proposing to base BAT on chemical precipitation followed by a low hydraulic residence time biological treatment including ultrafiltration, the technology which EPA determined to be BAT in the 2020 rule. Under CWA section 301(b)(2)(A), BAT is supposed to result in ''reasonable further progress toward the national goal of eliminating the discharge of all pollutants'' and ''shall require the elimination of discharges of all pollutants if the Administrator finds . . . that such elimination is technologically and economically achievable'' as determined in accordance with CWA section 304(b)(2)(B). The record shows that the 2020 rule industrywide BAT technology

[50] Final DuPont Meeting Notes (SE08618), Notes from Vendor Call with DuPont October 29 and December 8, 2021 (SE10245).

[51] A 37th project that will result in zero discharge may have also been completed: *www.woodplc.com/insights/articles/engineering-solutions-for-wastewater-treatment.*

[52] EPA acknowledged as much in both the 2015 and 2020 rules.

[53] *See, e.g.,* APEC (Asia-Pacific Economic Cooperation) Energy Working Group. 2015. *Water Energy Nexus: Coal-Based Power Generation and Conversion—Saving Water.* EWG 08/2014 A. December. Available online at: *www.apec.org/docs/default-source/Publications/2017/2/Water-Energy-Nexus-Coal-Based-Power-Generation-and-Conversion-----Saving-Water/217_EWG_APEC-Energy-Water-Nexus-Report-20161230-_CPAU_010217.pdf.*

[54] The Italian thermal systems discussed first in the 2013 proposed rule have been in operation for over a decade.

[55] Spray dry absorbers, effectively the same technology as the SDE, have been in use for decades to capture the same pollutants present in FGD wastewater.

[56] ''Proven technology (considered BAT for new sources by EPA). 3+ U.S. installations and 6+ European installations by Aquatech'' (SE07206).

[57] SE10234.

[58] SE09998.

[59] EPRI (Electric Power Research Institute). 2017. *Thermal Evaporation Technologies for Treating Power Plant Wastewater: A Review of Six Technologies.* 000000003002011665. (SE06971).

[60] The record indicates that individual utilities have found thermal and/or SDE systems to be less expensive than membrane (and even biological) systems in some cases.

[61] Thermal Evaporation Cost Methodology (SE10246).

[62] Spray Dryer Evaporator Cost Methodology (SE10247).

[63] EPA evaluated the non-water quality environmental impacts of these technologies in *Alternative Brine Management Methodology* (SE10243). EPA performed this evaluation in the context of brine management technologies for membrane filtration, and the types of impacts and findings would remain the same even if used as standalone technologies.



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basis for FGD wastewater removes fewer pollutants than the BAT basis of chemical precipitation plus membrane filtration identified in this proposal. Similarly, except for the permanent cessation of coal combustion subcategory discussed in Section VII.C.3 of this preamble, EPA is not identifying the less stringent (and previously rejected) technologies of surface impoundments or chemical precipitation, as these technologies too will remove fewer pollutants than the BAT in this proposal.

2. BA Transport Water

EPA is proposing dry handling or closed-loop systems as the technology basis for establishing BAT limitations to control pollutants discharged in BA transport water. EPA proposes to find that these technologies are technologically available, are economically achievable, and have acceptable non-water quality environmental impacts after evaluating the factors specified in CWA section 304(b)(2)(B). Specifically, dry handling systems include mechanical drag systems (*e.g.,* submerged chain conveyors), submerged grind conveyors (*e.g.,* compact submerged conveyors), air-cooled conveyor systems, and pneumatic systems. Closed-loop systems consist of remote mechanical drag systems paired with any necessary storage tanks, chemical addition systems, and/or RO treatment necessary to fully recycle BA transport water.[64]

In the 2020 rule, EPA rejected dry handling or closed-loop systems as the BAT technology basis in favor of high recycle rate systems due to process changes plants made to comply with the CCR rule (*i.e.,* re-routing non-CCR wastes to their wet BA handling systems to avoid sending them to their unlined surface impoundments, as the CCR rule's cease-receipt-of-waste date approached), as well as the additional costs of dry handling or closed-loop systems. EPA also stated in 2020 that many plants may not, as a technical matter, be able to fully close their BA handling systems to operate without discharge. Upon further careful consideration of the record and the CCR rule, EPA does not think that plants need a purge allowance to comply with the CCR rule. While in some cases plants may incur additional costs to achieve zero discharge by making process changes, the widespread use of dry handling or closed-loop systems supports the view that these technologies are available. As explained below, EPA proposes to find that the technologies are available and economically achievable, and they have acceptable non-water quality environmental impacts. Thus, EPA is proposing dry handling or closed-loop systems as the BAT technology basis for BA transport water.

In the first subsection immediately below, EPA discusses its rationale for proposing dry handling or closed-loop systems as BAT for BA transport water. In the following subsection, EPA discusses why it is not proposing less stringent technologies than dry handling or closed-loop systems. In the final subsection, EPA solicits comment on issues associated with a BA transport water purge allowance and bottom ash contact water.

a. Dry Handling or Closed-Loop Systems

*Availability of dry handling or closed-loop systems.* Based on the record, EPA proposes to find that dry handling or closed-loop systems are technologically available. At the time of the 2020 rule, EPA estimated that more than 75 percent of plants already employed dry handling systems or wet sluicing systems in a closed-loop manner, or had announced plans to switch to such systems in the near future. The high percentage of plants already employing these systems indicates that they are technologically available. Some of these systems have been in use since the 1970s, and today, most facilities have installed one or more such systems.[65]

In the 2015 and 2020 rule preambles, EPA discussed the widespread use of dry handling systems for control of BA transport water servicing approximately 200 EGUs at over 100 plants. In the 2020 rule, EPA also discussed advances in dry BA handling systems. Specifically, the Agency discussed a newer technology called submerged grind conveyors (one example of which is called a compact submerged conveyor). At the time, compact submerged conveyors were known to be installed and in operation at two plants. EPA has since learned that about 12 compact submerged conveyors have been installed.[66] [67] Partly due to the increased use of compact submerged conveyors, more dry handling systems are currently in place than EPA originally forecasted. For example, as indicated in the 2020 rule record, one utility commented that it had space constraints at a facility that would preclude the installation of a compact submerged conveyor, and EPA thus projected that this facility would employ a high recycle rate system under the 2020 rule. Since the 2020 rule, however, that utility ultimately proceeded to install a different dry handling system, which highlights the broad array of dry handling options available for coal-fired power plants, regardless of their configuration. Even where space constraints may prohibit certain dry systems, a plant could use a pneumatic system, albeit at a somewhat greater cost. The 2020 rule record included information on 50 pneumatic installations from as early as 1992. Given that BAT is to reflect the best performing plant in the field *Kennecott* v. *EPA,* 780 F.2d at 447, and the facts in the record support the use of dry handling technology to achieve zero discharge of BA transport water, EPA could propose to identify dry handling as the sole technology basis for control of BA transport water. Nonetheless, as it did in the 2015 rule, EPA is proposing to also identify closed-loop systems as a BAT technology basis for controlling discharges of BA transport water, given that a limited number of plants may find that option to be more attractive due to space constraints and lower costs when compared to a pneumatic system.

After the 2015 rule and throughout the 2020 rulemaking, certain industry representatives argued that there are challenges to operating a closed-loop BA handling system in a truly zero discharge manner. They argued that closed-loop systems, including remote MDS and dewatering bins, cannot maintain fully closed-loop operations due to chemistry issues or water imbalances in the system, such as those that might occur from unexpected maintenance or large precipitation events. However, even accounting for these issues, the 2020 rule did not find that closed-loop systems are not technologically available. Information in EPA's 2020 rule record indicated that plants can operate their closed-loop systems to achieve zero discharge, although this could require some process changes and their resulting costs. The 2020 record found that industry could achieve complete recycle

[64] In addition to remote MDSs, non-BAT technologies include many dewatering bins (also known as hydrobins), and surface impoundments may also have the flexibility to operate as closed-loop systems. Like remote MDSs, the latter systems may need to install chemical addition systems (acid, caustic, and/or flocculants), RO systems, and/or additional storage tanks to operate as fully closed loop.

[65] One vendor estimates that only seven ash conversions remain in the entire industry.

[66] Some utilities have even suggested that the discussion of compact submerged conveyors in the final 2020 rule preamble and additional compliance timeframes have led them to consider these newer dry systems rather than a previously contemplated high recycle rate/closed-loop system.

[67] Final Burns & McDonnell Meeting Notes (SE10248).



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at an additional cost of $63 million per year in after-tax costs (beyond the costs of the systems themselves) over the 2015 rule's estimates. Moreover, EPA's cost estimates at the time were admittedly conservative, as the Agency assumed the need to treat 10 percent of the BA handling system's volume using RO for every facility with a closed-loop system. See Section VIII of this preamble for a further discussion of costs associated with the proposed closed-loop system technology basis.

In the 2020 rule record, EPA discussed four potential challenges with maintaining closed-loop systems: (1) managing non-BA transport water inflows, (2) managing precipitation-related inflows, (3) managing unexpected maintenance events, and (4) maintaining water system chemistry. As further discussed below, based on the current record, none of these previously discussed challenges provide a reasoned basis for finding closed-loop systems not to be technologically available, although these issues may in certain circumstances require a plant to incur additional costs.

First, in 2020, EPA stated that managing non-BA transport water inflows had the potential to result in water imbalances within a closed-loop system. With respect to the inflow of other wastestreams into the BA handling system, EPA's record in the 2015 and 2020 rules indicates that closed-loop systems (*i.e.,* remote MDSs) can be sized to handle these additional wastestreams.[68] To ensure effective operations when designing and procuring closed-loop systems, facilities should seek to size these systems for all wastestreams the system would handle. Moreover, there is no evidence in the record that unanticipated inflows cannot be addressed with reasonable steps.[69] EPA solicits comment on whether the best performing remote MDSs have documented non-BA transport water inflows regularly exceeding the ability of the systems to reuse their wastewater. EPA solicits comment providing data from any remote MDS that would suggest whether a purge allowance is or is not appropriate due to the technological availability of the system.

Second, in 2020, EPA stated that managing precipitation-related inflows had the potential to result in water imbalances in the BA handling system. However, EPA's record shows that precipitation-related inflows can be adequately managed with design improvements, including the use of roofing where appropriate. The 2015 BAT technology basis and 2020 rule remote MDS technology designs included and costed for covers to avoid collecting precipitation.[70] There is no record evidence that this previously discussed precipitation-related challenge cannot be overcome with reasonable steps and, therefore, this concern does not provide a basis for rejecting closed-loop systems as BAT. EPA solicits comment on whether the best performing remote MDSs have documented precipitation inflows that have exceeded the ability of the systems to reuse or store their wastewater, or whether the technology issue can be addressed by undertaking measures at a reasonable additional cost. EPA solicits comment providing data from such systems that would suggest whether a purge allowance is or is not warranted. EPA solicits comment on allowing for unlimited one-time purges due to large precipitation events exceeding a 10-year storm event of 24-hour or longer duration (*e.g.,* a 30-day storm event) where drains or other precipitation-collection components may not be amenable to roofs or other covers, including any necessary reporting or recordkeeping requirements. Due to the increasing storm severity associated with climate change, EPA also solicits comment on whether a different type of storm event would be more appropriate. Should EPA allow such discharges, the Agency solicits comment on whether to require facilities to submit information when they discharge, such as why the discharge was necessary, how much was discharged, or any other specific information (*e.g.,* meteorological information) that would be helpful to the permitting authority or public at large.

A third previously discussed challenge mentioned in the 2020 rule to operating a remote MDS as a closed-loop system is the possibility of infrequent maintenance events that might fall outside the 2015 rule exemption of ''minor maintenance'' and ''leaks'' from the definition of BA transport water. EPRI (2018) listed several such maintenance events; most were expected to occur less than annually. EPRI provided information about the estimated frequency and volume of water associated with each maintenance event; however, EPRI did not provide information about a specific remote MDS unable to manage these maintenance events with existing maintenance tanks. Furthermore, even where maintenance wastewater volumes are too large to be managed in existing maintenance tanks, utilities can, at additional cost, lease storage tanks for short-term maintenance where these infrequent maintenance events are foreseeable.[71] There is no record evidence that infrequent maintenance events cannot be overcome with reasonable steps and, therefore, this concern does not provide a basis for rejecting closed-loop systems as BAT. EPA solicits comment on whether data from such systems would suggest a purge allowance is or is not warranted, as well as on the underlying data. EPA also solicits comment on whether the Agency should expand the existing ''minor maintenance event'' exemption from the definition of BA transport water in § 423.11(p). One example of such a potential expansion could include changing the current language that excludes ''minor maintenance events (*e.g.,* replacement of valves or pipe section)'' to instead state ''minor maintenance (*e.g.,* replacement of valves or pipe sections) or infrequent (*i.e.,* occurring less than annually) maintenance events.'' Another example would be to delete the term ''minor'' and associated parenthetical and merely say ''maintenance events.'' To the extent that EPA expands this exemption in 40 CFR 423.11(p), the Agency also solicits comment on any appropriate reporting or recordkeeping requirements. For example, EPA is interested in commenters' views on whether, when a facility discharges due to a maintenance event, facilities should submit information about why it was necessary to discharge, how much was discharged, or any other specific information that would be helpful to the permitting authority or broader public. Furthermore, EPA solicits comment on whether implementation of such a change to the definition of BA transport water should require, for example, a demonstration that the maintenance water could not be managed within the system.

The final engineering challenge discussed in the 2020 rule record as a reason for selecting high recycle rate systems rather than closed-loop systems was the need to maintain water system chemistry. The 2020 rule discussed

[68] For example, the Belews Creek remote MDS discussed during the 2020 rulemaking also accepts economizer ash and pyrites (SE07137).

[69] Even including dewatering bins, which are not the basis for either the 2015 BAT for BA transport water or this proposed BAT, the 2020 record included only a single facility where the water inflows to its dewatering bin system were too great to be recycled due to the presence of other wastewaters.

[70] 2020 Supplemental TDD (EPA–821–R–20–001).

[71] In contrast, if the maintenance discharge is caused by an unforeseeable upset condition, the plant would have an affirmative defense to an enforcement action if the requirements of 40 CFR 122.41(n) are met.



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potentially problematic system chemistries, such as extreme acidic conditions, high scaling potential, and the buildup of fine particulates that could clog pumps and other equipment. The 2015 closed-loop system BAT design basis included a chemical addition system to manage these system chemistries. In particular, corrosivity could be managed through pH adjustment, scaling could be managed with acid and/or antiscalants, and fines could be further settled out with polymers and other coagulants. EPRI [72] documented that some systems went slightly further, pairing the chemical addition systems with changes in operations such as higher flow rates or longer contact time. Even where all else fails, the same slipstream of purge allowed under the 2020 rule could be treated with RO and recycled back in as clean makeup water. While it is possible that addressing these issues could entail additional costs, there is no record evidence that this chemistry-related challenge cannot be overcome with reasonable steps and, therefore, this concern does not provide a basis for rejecting closed-loop systems as BAT. EPA solicits comment on the extent to which any plant using a remote MDS has tried all the processes described above and still failed to adequately control system chemistry. EPA solicits comment on whether data from such systems would suggest a purge is or is not warranted, as well as on the underlying data.

For all the foregoing reasons, EPA proposes to find that the record indicates that dry handling or closed-loop systems are technologically available for control of discharges in BA transport water. Moreover, dry handling or closed-loop systems would result in reasonable further progress toward the Act's goal of eliminating the discharge of all pollutants, as the limitations based on this technology would require zero discharge of BA transport water from the steam electric industry.

*Economic achievability of dry handling or closed-loop systems.* EPA proposes to find that the costs of dry handling or closed-loop systems are economically achievable for the industry as a whole. In the 2020 rule, EPA cited the additional costs of closed-loop systems as part of its basis for selecting high recycle rate systems. In the 2020 rule record, EPA noted that it had ''conservatively'' estimated costs of $63 million per year based on all facilities using a remote MDS needing a 10 percent purge to be treated with RO in order to achieve complete recycle (*i.e.,* zero discharge operations). However, EPA never found that the additional costs to achieve zero discharge were not economically achievable. Moreover, the 2020 rule record never demonstrated that a full 10 percent purge at all facilities was a realistic costing assumption. The primary basis for the 2020 rule purge allowance was a 2016 report from EPRI that involved continuous purges, the majority of which were well under one percent. Thus, in the 2020 rule record, EPA presented a sensitivity analysis with costs for a two percent purge treatment, which may better reflect actual operations.

Even using the more conservative cost estimates in the baseline IPM analysis for the 2020 rule (*i.e.,* full implementation of the 2015 rule),[73] the record demonstrated minimal changes in coal combustion and in steam electric power plant retirements. After updating these conservative cost estimates to $45 million per year pre-tax in proposed Option 3, the IPM analysis performed for this proposed rule continues to demonstrate that, after including the costs of treating all wastestreams—including achieving zero discharge for BA transport water—the proposed rule would result in minimal economic impacts. (For further information, see Sections VII.F and VIII of this preamble). Because EPA is required to consider whether the cost of BAT can be reasonably borne by the industry and confers on EPA discretion in consideration of the BAT factors, *see, e.g., Chem. Mfrs. Ass'n* v. *EPA,* 870 F.2d at 262; *Weyerhaeuser* v. *Costle,* 590 F.2d at 1045, EPA proposes to find that these additional costs are economically achievable as that term is used in the CWA.

*Non-water quality environmental impacts of dry handling or closed-loop systems.* EPA proposes to find that the non-water quality environmental impacts associated with dry handling or closed-loop systems for controlling BA transport water discharges are acceptable. See Sections VII.G and X of this preamble below for more details.

*Process changes associated with dry handling or closed-loop systems.* EPA also rejected closed-loop systems in the 2020 rule due to process changes happening at steam electric facilities as they move toward compliance with the CCR rule. EPA stated that as plants close their surface impoundments under the CCR rule, they may choose to send certain non-CCR wastewaters to their BA handling system. This could complicate their efforts to fully close their BA handling systems due to increased scaling, corrosivity, or plugging of equipment. Alternatively, EPA mentioned that a closed-loop requirement might incentivize plants to discharge their non-CCR wastes rather than send them to their BA handling systems for control, in which case they would be subject to less stringent requirements governing low-volume wastes. EPA also suggested that requiring limitations based on closed-loop systems could result in plants using their surface impoundments longer, assuming plants cannot build alternative storage capacity and need to continue to send their non-CCR wastes to unlined impoundments.

The rationale in the 2020 rule is not persuasive under the timeframe of any final ELG rule because by the time any BA transport water requirement would be implemented in NPDES permits, the CCR rule ash pond cease receipt of waste dates will have long since passed, or this rule's proposed subcategories could address any remaining CCR coordination issue. The CCR Part A rule required plants to cease receipt of waste in unlined surface impoundments by April 11, 2021.[74] This date has already passed, with most facilities having completed conversions from leaking, unlined surface impoundment BA handling systems to a CCR rule-compliant BA handling system (*i.e.,* systems that do not rely on unlined CCR surface impoundments). Of the remaining unlined surface impoundments, those operating under CCR Part A flexibility found in § 257.103(f)(2) are permanently ceasing coal combustion, and EPA proposes to continue to treat them differently under the subcategory for EGUs permanently ceasing coal combustion by 2028. This leaves only the unlined surface impoundments where alternative capacity is technically infeasible, a CCR Part A flexibility with maximum timeframes of October 15, 2023, and October 15, 2024, to cease receipt of waste.[75] These later dates require EPA approval.[76] Even with extensions, nearly every facility will have completed its conversion to a CCR rule-compliant BA handling method by 2024, the year in which EPA intends to promulgate any final ELG following this proposal. Since EPA expects that all facilities would comply with the CCR

[72] SE08927.

[73] The 2020 rule analysis had a baseline of zero discharge under the 2015 rule.

[74] 40 CFR 257.101(a)(1).

[75] 40 CFR 257.103(f)(1)(vi).

[76] Further information on the implementation of these Part A applications is available on EPA's website at: *www.epa.gov/coalash/coal-combustion-residuals-ccr-part-implementation.*



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rule cease-receipt-of-waste provisions and have alternative BA handling systems or compliant surface impoundments by then, there are no looming deadlines and tight timeframes that would justify continued flexibility. Instead, with the work to meet these CCR deadlines completed, facilities with high recycle rate systems would be free to focus on transitioning those high recycle rate systems to closed-loop operations.[77] Thus, EPA proposes that there are no ''process change'' reasons related to the CCR rule that undermine EPA's proposed BAT basis of dry handling or closed-loop systems for control of BA transport water discharges.

b. EPA Proposes To Reject as BAT Less Stringent Technologies Than Dry Handling or Closed-Loop Systems

Except for the early adopter subcategory, EPA is not proposing to base BAT on high recycle rate systems. In the 2020 rule, EPA reversed its decision from the 2015 rule and determined that closed-loop systems were not BAT. As a result, EPA established a volumetric purge allowance (with a maximum of 10 percent of the system volume) to be determined on a case-by-case basis by the permitting authority, which required a permitting authority's BPJ analysis to determine whether that purge required further control. As discussed above, the technological issues can be resolved, albeit at potentially additional costs, which EPA now proposes are economically achievable. Furthermore, a dewatering bin or remote MDS with a purge removes fewer pollutants than the proposed BAT basis of dry handling or closed-loop systems, which the Agency proposes to find are technologically available, are economically achievable, and have acceptable non-water quality environmental impacts. Under CWA section 301(b)(2)(A), BAT is supposed to result in ''reasonable further progress toward the national goal of eliminating the discharge of all pollutants'' and ''shall require the elimination of discharges of all pollutants if the Administrator finds . . . that such elimination is technologically and economically achievable'' as determined in accordance with CWA section 304(b)(2)(B). Because high rate recycle systems achieve fewer pollutant removals than the dry handling or closed-loop systems EPA has proposed as BAT, such less stringent technologies would not result in reasonable further progress toward the CWA's goal of eliminating the discharge of pollutants.

Except for the permanent cessation of coal combustion subcategory, EPA is also not identifying the less stringent (and previously rejected) technology of surface impoundments as the technology basis for BAT, as this technology would also remove fewer pollutants than the proposed BAT basis of dry handling or closed-loop systems, which EPA proposes are technologically available, are economically achievable, and have acceptable non-water quality environmental impacts.

c. Solicitation of Comment on Additional BPJ-Based Permitting Constraints and Issues Related to BA Contact Water

Despite the preceding discussion, if EPA were to maintain the 2020 rule's purge allowance, the Agency solicits comment on whether it should establish constraints and additional requirements on where and how a purge may be allowed on a case-by-case basis. All the instances EPA is aware of involving requests by plants to purge BA transport water under the 2020 rule have included a request for a full 10 percent purge. The limitation EPA established in the 2020 rule was, however, a site-specific purge allowance with a maximum 10 percent threshold. In practice, this flexibility has resulted in a situation where BA handling systems either achieve zero discharge or purge the maximum 10 percent. EPA notes that all the chemistry-related purges discussed in EPRI (2016) were one percent or less of system volume, and it solicits comment on whether, if a final rule were to include allowance for any purge, the Agency should constrain the purge allowance to reflect the smaller continuous purge volumes in EPRI (2016). EPA also solicits comment on whether, in the event of allowance of any purge, the permittee should provide further analysis and justification to the permitting authority or if EPA should place further constraints on the permitting authority in allowing purges. For example, EPA solicits comment on whether permittees should be required to complete an engineering study, starting with closed-loop operations and slowly increasing purge as necessary after demonstrating that the system cannot be operated with the existing level of purge (*e.g.,* by using chemical addition systems, changing flows, or residence time).

Moreover, if EPA elects to retain a high recycle rate system as BAT for BA transport water, the Agency is interested in whether there should be any additional constraints on the purge allowance to ensure that the pollutant reductions achieved are consistent with the reductions expected from the BAT technology basis. In particular, EPA has become aware of system operations that recycle a high percent of water, but in practice may not achieve pollutant removals as high as those of the remote mechanical drag chain and dewatering bin systems described in the 2020 rule preamble, which were the bases for the following findings:

Based on actual, measured purge rates in EPRI (2016), however, the agency estimates that actual purge rates necessary on a day-to-day basis may be less than one percent of the system's volume, with higher purges necessary at less frequent intervals due to precipitation and maintenance. Furthermore, while surface impoundments can cover dozens of acres and contain volumes in the billions of gallons, typical high recycle rate systems have volumes closer to one-half million gallons (½ million). Thus, even assuming the proposed maximum allowable purge of 10 percent is necessary for a unit, the average gallons per day released by high recycle rate systems will be two percent of the average gallons per day released by surface impoundments, and therefore will also be 1.5 percent of the pollutant releases expected from surface impoundments. Industry-wide, EPA estimates this combination of reduced volume and increased recycling reduces discharges by 366 million lb/year of pollutants, and thus makes reasonable further progress toward the CWA goal to eliminate the discharge of pollutants. *See* 33 U.S.C. 1251(a), 1311(b)(2)(A). Therefore, it is the combination of the reduced system volume and high capacity to recycle BA transport water that supports EPA's basis for high recycle rate systems as BAT. (Emphasis added.)

As an example of such a system, following the 2020 rule, EPA became aware of one plant that intentionally constructed a concrete basin system intended to recycle only 90 percent of BA transport water (Smith et al., 2022).[78] Due to the size of this system, the 10 percent purge generated results in a much greater volume of discharged wastewater than the 2020 rule contemplated. This facility is not unique in its use of large, concrete basins. The APS Four Corners power

[77] Although EPA estimates that fully closing the loop would be less expensive than converting to dry handling, nothing would preclude a facility with a high recycle rate system from installing one of the technologically available and economically achievable dry handling systems.

[78] *See www.woca2022.conferencespot.org/event-data/pdf/catalyst_activity_28074/catalyst_activity_paper_20220329020324138_a6f09dfc_ad86_4183_9ecb_a71e88b48245.*



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plant recently submitted a request for a 10 percent purge of BA transport water[79] where the claimed system volume of over 4.5 million gallons would result in a BA transport water purge of nearly one-half MGD, a volume greater than the entirety of the purges claimed for the Duke Energy coal fleet.[80] While the facility employs dewatering bins as the primary BA handling mechanism, part of this high volume discharge request appears to stem from the large concrete basins, or ''tanks,'' that APS has installed. EPA solicits comment on other facilities that have installed concrete basin systems or tanks and any facts describing the size, flows, and other operational parameters of such systems. Furthermore, should EPA ultimately elect to retain a purge allowance for BA transport water, the Agency solicits comment on whether the total volume (not just the percent) of purge should also be limited to ensure that the system achieves the pollutant removals of a true high recycle rate system (*i.e.,* a remote MDS).

While EPA is concerned that the site-specific purge in the 2020 rule may be unnecessary or not adequately justified, the Agency also notes that ''dry handling'' systems often are not completely dry. EPRI (2014) included information about an MDS with purge of 270 gpm from an under-boiler ''dry handling'' system. EPA has received additional flow diagrams in the most recent information collection that show purges from additional MDS systems.[81] Thus, while many facilities have installed pneumatic and air-cooled drag chain systems, many EGUs with ''dry handling'' due to under-boiler MDS or compact submerged conveyor systems still rely on wet hoppers that catch and cool hot (in some cases molten) BA in quench water. EPA has not considered this BA contact water to be transport water (instead considering it within the catch-all category of low volume wastewater), because, as explained in the 2015 rule, the water is not used to transport the BA, resulting in decreased contact times (and thus decreased pollutant concentrations) from the BA. While overall pollutant concentrations may be lower, leaching data in the 2015 CCR rule record indicate that some constituents wash out due to their high solubility.[82] For these pollutants, there may be little difference in concentration between transport water and contact water. In the absence of data from actual under-boiler purges, EPA solicits comment providing data and purge examples from existing dry handling systems. EPA solicits comment on whether limiting or removing the ability to purge from a high recycle rate system but not from a ''dry'' under-boiler system may result in unwarranted disparate treatment or perverse incentives. EPA solicits comment on whether there is a potential unwarranted disparity and how the Agency might address this disparity to avoid potentially encouraging larger discharges. For example, EPA solicits comment on whether it should continue to allow (or alternatively not allow, through a zero-discharge requirement) a purge for both contact water and transport water. Since contact water is not covered by the definition of transport water in 40 CFR 423.11(p), EPA solicits comment on whether the purge of such water should nevertheless be included as ''bottom ash purge water'' under § 423.11(cc) and thus subject to a BPJ analysis by the permitting authority.

3. Combustion Residual Leachate (CRL)

EPA is proposing chemical precipitation as the technology basis for establishing BAT limitations to control pollutants discharged in CRL. After evaluating the factors specified in CWA section 304(b)(2)(B), EPA proposes that this technology is available, is economically achievable, and has acceptable non-water quality environmental impacts. Specifically, the proposed BAT basis consists of chemical precipitation/coprecipitation employing the combination of hydroxide precipitation, iron coprecipitation, and sulfide precipitation.

In the subsection immediately below, EPA discusses its rationale for proposing chemical precipitation as BAT for control of leachate. In the following subsection, EPA solicits comment on whether it should base BAT for CRL on more stringent technologies, such as chemical precipitation plus biological treatment, chemical precipitation plus membrane filtration, or chemical precipitation plus thermal treatment, and whether these technologies are technologically available, are economically achievable, and have acceptable non-water quality environmental impacts, as discussed below. In the third subsection, EPA discusses why it is not proposing to establish BAT for control of pollutants in CRL based on surface impoundments. In the fourth subsection below, EPA solicits comment on additional options related to co-treatment of FGD and CRL wastewater, a potential grandfathering provision, co-treatment of CRL and stormwater, and potential differences in leachate associated with pre- and post-close of landfills. Finally, in the last subsection below, EPA solicits comment on EPA's estimates of potential costs and loads of pollutant discharges through groundwater, treatment differences, and potential subcategorization related to discharges through groundwater.

a. Chemical Precipitation

*Technological availability of chemical precipitation.* EPA proposes to find that chemical precipitation is technologically available for control of CRL discharges. In the 2015 rule record, EPA found that chemical precipitation systems are technologically available for treating CRL, capable of achieving low effluent concentrations of various metals, and effective at removing many of the pollutants of concern present in CRL discharges to surface waters. The Agency also found that the pollutants of concern in CRL are the same pollutants that are present in, and in many cases are also pollutants of concern for, FGD wastewater, FA transport wastewater, BA transport water, and other CCR solids. This proposed finding is consistent with the findings of this technology as the basis for the 2015 rule's NSPS and PSNS for CRL.[83]

EPA is basing the proposed effluent limitations on the chemical precipitation system for treating FGD wastewater as described in the 2015 rule record because the record indicates that CRL wastewater is similar to FGD wastewater, which the record demonstrates can be effectively treated using chemical precipitation. Specifically, the system serving as the BAT technology basis employs equalization, hydroxide and organosulfide precipitation, iron coprecipitation, and removal of suspended and precipitated solids. As discussed in Section VI of this preamble above, EPA asked eight utilities to

[79] An updated submission made to EPA has since reduced this request to between two and 2.5 percent of system volume and is currently being evaluated by the Agency.

[80] In contrast, the purge requests from Duke Energy estimated a 10 percent purge of between approximately 50,000 and 100,000 gallons per day at each of the company's five plants with such systems.

[81] These flow diagrams did not include flow rates or pollutant concentrations. (SE09754 and SE09724.)

[82] U.S. EPA (Environmental Protection Agency). 2014. *Human Health and Ecological Risk Assessment of Coal Combustion Residuals.* 2050–AE81. December. Available online at *www.regulations.gov.* Document ID#: EPA–HQ–OLEM–2019–0173–0008.

[83] In establishing chemical precipitation as the basis for NSPS, the Agency stated that chemical precipitation is a well-demonstrated technology for removing metals and other pollutants from a variety of industrial wastewaters. 80 FR 67859.

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voluntarily perform CRL sampling at CCR landfills the Agency believed were new CCR rule-compliant landfills and/or expansions. EPA ultimately received supplemental CRL sampling data covering 25 landfills. EPA analyzed these data in the *CRL Analytical Data Evaluation* (SE10249) and found that CRL has a similar wastewater characterization to FGD wastewater. Chemical precipitation would make reasonable further progress toward the Act's goal of eliminating the discharge of all pollutants, as the limitations based on this technology would eliminate substantial amounts of arsenic, mercury, and other toxic pollutants from CRL discharges by the steam electric industry.

*Economic achievability of chemical precipitation.* EPA proposes to find that the costs of chemical precipitation for control of CRL discharges are economically achievable. This proposal includes IPM modeling of the preferred option (Option 3) which includes chemical precipitation costs for CRL. The results of the analysis show small changes in coal utilization and only one incremental retirement of a facility out of 871 steam electric power plants in the steam electric power generation industrial category. Furthermore, that plant already operates at a low capacity utilization rating. This is well within the economic impact estimated for other BAT rules and has been upheld by courts. *Chem. Mfrs. Ass'n* v. *EPA,* 870 F.2d at 252. As a result of this analysis, EPA proposes to find that chemical precipitation is economically achievable.[84] For further discussion of the economic analysis, see Sections VII.F and VIII of this preamble below.

*Non-water quality environmental impacts of chemical precipitation.* EPA proposes to find that the non-water quality environmental impacts associated with chemical precipitation to control CRL discharges are acceptable. See discussion below in Section VII.G and Section X of this preamble.

[84] EPA notes that the 2015 rule record indicated that the costs of treating CRL based on chemical precipitation were only marginally higher than the total costs in the selected option, which was found to result in minimal economic impacts. Furthermore, the cost screening in 2015 found that only a small portion of the plants and parent entities would experience costs greater than one percent or three percent of revenue, even with chemical precipitation treatment of CRL. While these thresholds do not necessarily equate to what is economically achievable, they may serve as a screening analysis to find that the costs do not raise economic achievability concerns.

b. More Stringent Technologies Than Chemical Precipitation

EPA solicits comment on whether the technology basis for BAT limitations to control discharges of pollutants in CRL should be based on more stringent technology, such as biological treatment, spray dry evaporation, thermal systems, or membrane filtration. The record includes plants that have successfully treated a combination of CRL and FGD wastewater with chemical precipitation as pretreatment for biological or thermal systems. This successful treatment history may further support the availability of chemical precipitation either alone or as pretreatment for more advanced systems. EPA solicits comment and additional data about these systems treating CRL beyond chemical precipitation and further solicits comment on whether and to what extent it should instead, or in addition, base BAT limitations applicable to CRL on these technologies.

With respect to biological treatment, EPA solicits comment on whether it should base BAT limitations applicable to CRL on chemical precipitation plus biological treatment. In the 2015 rule record, EPA found that chemical precipitation plus biological treatment was technologically available and in use domestically to treat a mix of FGD wastewater and CRL. Given the data cited above showing the similarity of FGD and CRL wastewater, EPA solicits comment on transferring the FGD wastewater technology basis and BAT limitations from the 2020 rule as the technology basis and BAT limitations for CRL as well.

With respect to thermal treatment, the 2020 rule record included a facility that co-treated its FGD wastewater and CRL with a thermal system to achieve zero discharge. At least four vendors have conducted thermal system pilots on CRL, and there has been one full-scale thermal system installation for the treatment of CRL. EPA has identified four vendors that have conducted successful thermal system pilots, and each of these vendors has installed multiple full-scale thermal systems at non-power plant landfills. Thus, EPA solicits comment on finalizing a zero-discharge requirement for CRL based on chemical precipitation plus thermal treatment systems and/or SDE treatment systems, or alternatively on transferring the chemical precipitation plus thermal treatment-based BAT limitations established for the FGD wastewater NSPS in the 2015 rule.

With respect to membrane treatment, as discussed above under FGD wastewater, the record is also replete with the use of membrane filtration for a variety of wastestreams with characteristics like high TDS, high scaling potential, and high variability, both within the steam electric sector and in other industries. Furthermore, one midwestern facility conducted a successful pilot of a membrane filtration system on CRL.[85] EPA solicits comment on establishing zero discharge BAT limitations for CRL based on chemical precipitation plus membrane filtration, or alternatively on transferring the membrane filtration limitations established in the VIP for FGD wastewater in the 2020 rule.

EPA also solicits comment on establishing limitations based on any combination of chemical precipitation plus membrane filtration, chemical precipitation plus thermal, and/or SDE treatment. To facilitate comments on a zero discharge option, EPA has provided memos to the record evaluating the costs of achieving zero discharge of CRL and the associated pollutant reductions.[86] Should EPA finalize BAT limitations based on more stringent technologies than chemical precipitation, EPA also solicits comment on the appropriateness of revising NSPS and PSNS for CRL based on a more stringent technology than the NSPS basis selected in the 2015 rule (chemical precipitation).

c. Less Stringent Technologies Than Chemical Precipitation

EPA is not proposing to base BAT limitations for control of CRL on surface impoundments because there are other technologies (like chemical precipitation) that achieve greater reductions in pollutant discharges, which EPA proposes are available and economically achievable, with acceptable non-water quality environmental impacts. Surface impoundments would not make reasonable further progress toward the national goal of eliminating the discharge of pollutants.

d. Solicitation of Comment on Additional Options Related to Co-Treatment of FGD and CRL Wastewater, Potential Grandfathering Provision, Co-Treatment of CRL and Stormwater, and Potential Differences in Discharges Associated With Pre- and Post-Closure of Landfills

EPA also solicits comment on whether EPA should create a

[85] This utility declined to provide the pilot in response to a voluntary request from EPA.

[86] Evaluation of Zero Discharge Options for CRL (SE10257).



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subcategory allowing facilities that co-treat their FGD and CRL wastewater to meet BAT limitations based on a different technology basis than the one used by facilities treating CRL alone. EPA solicits comment on whether there are engineering obstacles to such co-treatment based on proximity of the landfill or other factors. EPA also solicits comment on whether it would be appropriate to establish either a grandfathering provision that would allow such facilities a limited payback period to recover costs on the CRL treatment investments already made before having to comply with any new limitations or another provision that would account for the potentially unique circumstances of these facilities, in light of the factors specified under CWA section 304(b).

In developing the current record, EPA received information about systems that collect leachate and stormwater in the same system. For example, one type of system involves the use of chimneys that route stormwater straight through a landfill into the leachate collection system to minimize percolation through the CCR solids. Thus, EPA also solicits comment on flexibilities that might be warranted for such systems. For example, EPA solicits comment on whether such systems should be subcategorized, or whether either the definition of CRL or the applicability of the CRL limitations should exclude discharges when stormwater exceeds specific storm events, such as events used as the basis of the BA transport water purge allowance in the 2020 rule.

EPA also discussed the differences between pre- and post-closure landfill operations with several stakeholders. For example, post-closure, the CCR rule requires landfills and surface impoundments closing with waste in place to have a cap that is graded to minimize infiltration into the CCR solids. This will result in volumes of CRL decreasing significantly post-closure. EPA solicits comment on specific information that would suggest whether different limitations should apply to the same landfill or surface impoundment pre- and post-closure. The change in flows also means the amount of capital expenditure on treatment systems (larger flows lead to larger treatment systems) might be disparate for landfills and surface impoundments nearing closure when compared to those with many operating years remaining or to those that have already closed under the CCR rule. Thus, EPA solicits comment on whether there should be flexibility for landfills and surface impoundments nearing closure such that limitations could be postponed until after closure to avoid construction of a larger, more expensive system that would operate for only a relatively short period of time. EPA also solicits comment on whether CRL generated by already closed landfills and surface impoundments should be subcategorized, as well as information demonstrating whether subcategorization is warranted.

e. Solicitation of Comment on EPA Estimates of Potential Costs and Loads of Pollutant Discharges Through Groundwater, Treatment Differences, and Potential Subcategorization

EPA also notes that unlined landfills and surface impoundments potentially discharge CRL through groundwater before entering surface water.[87] EPA, through this action, is not addressing the definition of any terms in the CWA (such as ''point source'' or ''discharge of a pollutant'') that govern when a discharge is subject to NPDES permitting requirements or when a discharge to WOTUS through groundwater is a functional equivalent of a discharge and thus subject to the Act's NPDES permitting requirement. *See County of Maui* v. *Hawaii Wildlife Fund,* 140 S. Ct. 1462 (2020). Those issues are outside the scope of this rulemaking. EPA proposes that any discharge through groundwater that is the functional equivalent of a direct discharge under the *Maui* decision would be subject to the same BAT limitations as discharges that occur at the end of pipe. To evaluate the potential costs and loads of such discharges, EPA conducted *Evaluation of Potential CRL in Groundwater* (SE10250). EPA solicits comment on the appropriateness of the Agency's proposed BAT findings and their application to any discharges of CRL via groundwater that permitting authorities ultimately determine are subject to NPDES permitting. EPA also solicits comment on the extent to which CRL discharges through groundwater might be different than other discharges potentially subject to any final rule, including specific facts demonstrating that the chemical makeup, treatment effectiveness, or other factors differ from end-of-pipe discharges of CRL. EPA solicits comment on whether such discharges of CRL through groundwater should be defined as a separate wastestream or subcategorized and how, including whether these discharges should be subject to BAT limitations on a case-by-case, BPJ basis. Should EPA reserve these limitations such that permitting authorities' BPJ would apply, section 304(b) of the CWA, 33 U.S.C. 1314(b), and 40 CFR 125.3 specify factors the permitting authority would consider when establishing BPJ-based effluent limitations for CRL. Furthermore, EPA solicits comment on whether the Agency should explicitly set BAT equal to BPJ in the regulation and include additional constraints (*e.g.,* one or more presumptive standards) that are specific to this wastestream in this industry.

4. Legacy Wastewater

EPA proposes not to establish a nationwide BAT basis for legacy wastewater at this time and instead to continue to reserve these limitations for determination by the permitting authority, using its BPJ for what is technologically available, economically achievable, and has acceptable non-water quality environmental impacts. This potential case-by-case outcome was explicitly identified by the Court in *Southwestern Elec. Power Company* v. *EPA,* 920 F.3d at 1021, as an alternative EPA should have considered.

In the first subsection immediately below, EPA discusses its rationale for BPJ-based BAT limitations to control legacy wastewater. In the second subsection, EPA discusses why it is not proposing less stringent technologies as BAT for legacy wastewater. In the last subsection, EPA discusses why it is not selecting more stringent technologies as BAT for legacy wastewater and is soliciting comment on potentially different limitations for a subset of legacy wastewater.

a. BPJ-Based BAT Limitations

After evaluating the factors specified in CWA section 304(b)(2)(B), EPA is proposing to find that no single technology is technologically available and economically achievable on a nationwide basis for control of pollutants in legacy wastewater. Because of process changes happening at plants in the form of ongoing and soon-to-be-completed rapid surface impoundment closures under the CCR rule, EPA proposes that a nationwide BAT limitation for legacy wastewater that would be finalized mid-closure could be infeasible. The statute requires BAT to reflect what is technologically available, is economically achievable,

[87] Three panels in the 2022 World of Coal Ash conference included discharges through groundwater as a topic in their abstracts, and one abstract stated that surface impoundments are located so close to surface waters that the groundwater underlying the surface impoundment ''is often in hydraulic communication with surface water.'' DeJournett et al., 2022. Available online at: *www.woca2022.conferencespot.org/event-data/pdf/catalyst_activity_28060/catalyst_activity_paper_20220124235416545_8aa3636e_85c7_4a17_bcca_a3119e01a5f9.*

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and has acceptable non-water quality environmental impacts based on consideration of several factors, including ''process changes'' and ''such other factors'' as the Administrator deems appropriate. Because many facilities with surface impoundments are or will be in the process of closing their surface impoundments under the CCR rule, the technology that represents BAT for legacy wastewater treatment is likely to vary at any given site depending on several factors. These factors include, but are not limited to, the types of wastes and wastewaters present, the characteristics of the legacy wastewater in each layer of a surface impoundment, the amount of legacy wastewater remaining to be treated in a surface impoundment, the treatment option costs, the extent to which CWA requirements could interfere with closure timeframes required under the CCR rule, and the potential for increased discharges through groundwater. While there is no typical site given the dynamic and changing nature of this wastestream at this time, given the CCR rule's closure requirements, permitting authorities should seriously consider treatment beyond that afforded by surface impoundments, which the Fifth Circuit found to be arbitrary, capricious, and inconsistent with the ''technology-forcing mandate of the CWA.'' *Southwestern Elec. Power Company* v. *EPA,* 920 F.3d at 1017. The effect of finalizing this proposal would be for permitting authorities to continue to establish site-specific technology-based effluent limitations using their BPJ. Because the limitations would be derived on a site-specific basis, taking into account the requisite statutory factors and applying them to the circumstances of a given plant, EPA proposes that these case-by-case limitations would be technologically available and economically achievable and have acceptable non-water quality environmental impacts.

As part of this proposal, EPA is proposing to segregate legacy wastewater into two main categories of separately regulated discharges, which would each be subject to separate case-by-case technology-based effluent limitations established by the permitting authority (after considering the statutory factors). Legacy wastewater was defined in the 2015 rule preamble as:

''. . . FGD wastewater, fly ash transport water, bottom ash transport water, FGMC wastewater, or gasification wastewater generated prior to the date determined by the permitting authority that is as soon as possible . . .'' [88]

In practice, there are two distinct categories of legacy wastewater: (1) wastewater that is continuously or intermittently generated and discharged to a pond after the issuance of the first permit implementing the 2015 or 2020 rule but before the compliance date specified in the permit (the ''as soon as possible'' date required by the rule), and (2) wastewater that was discharged to the pond previously and will be discharged when the pond is dewatered for closure.

By segregating wastewaters continuously or intermittently generated and discharged after permit issuance from those already accumulated in closing surface impoundments, permitting authorities could justify more stringent BAT requirements on a BPJ basis for one or both categories of legacy wastewater. The first category is continuously or intermittently generated and discharged and may be able to be more easily transmitted to other treatment systems at the facility. The second type is typically treated with modular, leased systems for a shorter period, making treatment more affordable.

For example, regarding FGD wastewater generated after permit issuance but before the ''as soon as possible'' date determined by the permitting authority, a facility installing the 2020 BAT technology basis of chemical precipitation plus biological treatment and ultrafiltration may be able to operate the chemical precipitation module before the date the permitting authority determines is the soonest date that the more stringent limitations apply pursuant to § 423.11(t). In such a scenario, it would be reasonable for a permitting authority to establish BAT limitations for legacy FGD wastewater using a BPJ approach that would transfer mercury and arsenic limitations with a date corresponding to the operability of that chemical precipitation module. Since permitting authorities already determine the ''as soon as possible'' date, it is reasonable that the same information could be used for a BPJ analysis.

The state of Pennsylvania recently implemented a similar approach in an NPDES permit issued to Homer City. In the Homer City *NPDES Permit Fact Sheet Addendum 3,*[89] the state found the plant had ''voluntarily committed'' to a more stringent technology than BAT. The state further found that the plant needed time ''to plan, design, procure, and install equipment'' that would ''bring about a result that is more desirable under the Clean Water Act than a treated discharge—the elimination of a discharge.'' While the permit limits for this legacy wastewater were not as stringent as the 2020 rule FGD wastewater BAT limitations, the state permit required the discharger to meet interim effluent limits based on a chemical precipitation and aerobic biological treatment system that was available to this facility but may not be to other facilities, as the facility already had this technology in place before the completion of upgrades to achieve zero discharge.

The second category of legacy wastewater is wastewater accumulated over years in a surface impoundment that is later drained during the closure of that surface impoundment. Such wastewater consists of:

- surficial water located above the CCR solids (hereafter referred to as ''surface impoundment (SI) decant wastewater''); and
- pore water in the saturated CCR layer at levels beyond that needed for conditioning (hereafter referred to as ''surface impoundment (SI) dewatering wastewater'')

EPA also notes that there would necessarily be an interstitial zone where there may be some disturbed CCR solids. In this case, the water may not necessarily be pore water from CCR solids but would sufficiently mix with the CCR solids such that it presents similarly elevated pollutant concentrations. Hence, while it is not pore water per se, this interstitial zone water should be similarly situated with the pore water layer from a regulatory perspective. For this reason, EPA is proposing, and soliciting comment on, the following set of definitions and proposing to require a separate BAT/BPJ analysis for this category of legacy wastewater:

- The term ''surface impoundment'' means a natural topographic depression, man-made excavation, or diked area that is designed to hold an accumulation of coal combustion residuals and liquids, and the unit treats, stores, or disposes of coal combustion residuals.[90]
- The term ''surface impoundment decant wastewater'' means the layer of

[88] 80 FR 67854. CRL does not appear in this list because, in 2015, EPA did not establish more stringent limitations for this wastewater than the previously applicable BPT limitations.

[89] Available online at: *www.files.dep.state.pa.us/water/wastewater%20management/EDMRPortalFiles/Permits/PA0005037_FACT_SHEET_20210819_DRAFT_V2.pdf.*

[90] EPA has always sought to harmonize the CCR rule and this ELG. Therefore, this definition, and terms therein (*e.g.,* unit), was taken from 40 CFR 257.53 to match the definition under the CCR rule.



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a closing surface impoundment's wastewater that is located from the water surface down to the level sufficiently above any coal combustion residuals that, when drained, does not resuspend the coal combustion residuals.

- The term ''surface impoundment dewatering wastewater'' means the layer of a closing surface impoundment's wastewater that is located below surface impoundment decant water due to its contact with either stationary or resuspended coal combustion residuals.

EPA also proposes a clarifying change to the definition of ''tank'' to ensure that there would be no structure that would qualify as both a tank and a surface impoundment. By separating these legacy wastewaters as distinct wastestreams from the legacy wastewater definition discussed above, EPA is proposing that the treatment of SI decant and dewatering wastewaters can, and in many cases should, be subject to different limitations from the first category of continuously or intermittently generated and discharged legacy wastewater. For example, a permitting authority conducting a BPJ analysis for a plant with the first type of legacy wastewater discussed above (*e.g.,* a continuously or intermittently discharged FGD wastewater) may determine that BAT limitations based on chemical precipitation are appropriate for the plant's legacy FGD wastewater discharged before its ''as soon as possible'' date, and that BAT limitations based on chemical precipitation plus biological treatment are appropriate thereafter. At the same time, the same plant may have the second type of legacy wastewater—SI decant and/or dewatering wastewater. For example, the plant may be dewatering one or more surface impoundments with historically generated FA and BA transport water, which the permitting authority could determine should be subject to different BAT effluent limitations after performing a BPJ analysis. These limitations could be more or less stringent than the FGD-specific chemical precipitation limitations derived for discharges before the ''as soon as possible'' date.

Factors the permitting authority must consider when establishing BPJ-based BAT effluent limitations for these two types of legacy wastewater are specified in section 304(b) of the CWA, 33 U.S.C. 1314(b), and 40 CFR 125.3(d). EPA solicits comment on whether the Agency should explicitly promulgate specific elements related to these factors, which are particular to this wastewater in this industry, in regulatory text. For example, such specific elements could include: (1) technologies available at the site, (2) the characteristics of the legacy wastewater, (3) amount of remaining legacy wastewater, (4) the treatment option costs, (5) the extent to which CWA requirements would interfere with surface impoundment closure required under the CCR rule, (6) the completed stage of closure for each surface impoundment, or (7) the closure deadline under the CCR rule.

EPA notes that some permitting authorities have actively sought to regulate these SI decant and dewatering wastewaters (typically through water quality-based effluent limitations). For example, the state of North Carolina considered SI decant and dewatering wastewaters in issuing several permits to Duke Energy. These permits generally limited SI decant wastewater to a maximum elevation change (*e.g.,* one foot per day), applied controls to stop decanting if TSS or dissolved pollutants exceeded some fraction of the discharge limitations (*e.g.,* 50 percent of TSS, 85 percent of arsenic), and would not drop the water level below some threshold (*e.g.,* three feet above the CCRs).[91] These performance restrictions were also paired with monitoring and reporting requirements. EPA discussed these permits with North Carolina regulators who found that this set of restrictions in the uppermost layer (*i.e.,* SI decant water) have been sufficient to protect receiving water quality.[92] EPA also notes that this approach is consistent with the approach EPRI presents in section 4 of *Coal Combustion Residuals Pond Closure: Guidance for Dewatering and Capping.*[93] These same North Carolina permits place water quality-based effluent limitations on several pollutants that apply once the lower water levels (*i.e.,* SI dewatering wastewater) are reached. These pollutants differ for each permit, but generally have led to the inclusion of physical settling, chemical precipitation, and (for at least one facility) ZVI treatment [94] to remove TSS, metals, and selenium/nutrients, respectively. This makes these systems a potential basis for BAT for the newly defined SI decant and dewatering wastewaters. In response to a voluntary information request from EPA, Duke Energy declined to provide additional data on these systems.[95] EPA solicits comment on the costs and performance of all the systems discussed above and whether any of these systems could be used as a basis for a nationwide BAT limitations for SI decant and dewatering wastewaters.

EPA also learned that Minnesota Power has commissioned an SDE for its Boswell Energy Center.[96] On October 4, 2020, the plant also provided a notice of intent to close its unit 4 surface impoundment under the CCR rule.[97] EPA has learned that the SDE is currently used to evaporate SI decant and dewatering wastewater as part of its closure process. Once this impoundment is drained, the SDE will treat FGD blowdown and other plant wastewater such as bottom ash blowdown, pond water, and cooling tower blowdown. EPA solicits comment on this system's use, as well as cost and performance data related to this system. EPA solicits comment on whether an SDE might serve as a technology basis for BAT for SI decant and dewatering wastewaters.

While there may be technologies in use to treat these wastewaters, EPA notes that the vast majority of SI decant and dewatering wastewater is likely to have already been discharged pursuant to BPJ determinations under existing permits rather than in any new permits implementing any finalized ELG revisions. Rapid closure of many of these surface impoundments is ongoing under the CCR rule. EPA notes that the vast majority of surface impoundments had to cease receipt of waste by April 11, 2021, and commence closure soon after. These surface impoundments were either unlined and leaking, in violation of location restrictions, or both. Thus, the vast majority of surface impoundments have already begun the closure process, of which dewatering is one of the first steps. Since closure must be completed within five years, subject to limited extensions,[98] most surface impoundments potentially discharging SI decant and dewatering wastewater to comply with the CCR rule will no longer

[91] Requirements differ by permit. Permits are available online at: *www.deq.nc.gov/about/divisions/water-resources/duke-energy-npdes-wastewater-permitting.*

[92] Notes from Meeting with NC DEQ—December 13, 2021 (SE10258).

[93] EPRI (Electric Power Research Institute). 2014. *Coal Combustion Residuals Pond Closure: Guidance for Dewatering and Capping.* Palo Alto, CA. 3002001117. March.

[94] Duke Energy Site Visit Notes—November 2021 (SE10259).

[95] Although Duke declined to provide this information on claim that it was proprietary information of the vendors, EPA has already discussed some of these systems with the vendors and notes that the Agency can protect proprietary information as CBI.

[96] SE10376.

[97] This filing is available online at: *www.mp-ccr.azurewebsites.net/Content/Facilities/Boswell/Closure_And_Post_Closure/BEC%20Pond%204%20Notice%20of%20Intent%20to%20Close.pdf.*

[98] *See* 40 CFR 257.102(f).



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be discharging by 2026. As is the case for all promulgated effluent limitations guidelines, the requirements for direct dischargers [99] do not become applicable to a given discharger until they are contained in revised NPDES permits. NPDES permits are typically issued for the maximum allowed five-year permit term. Most permits are not immediately revised after EPA issues a new ELG rule. Moreover, it is not uncommon for permits to be administratively continued beyond the five-year permit term if a permittee submits a timely permit renewal application, in which case the existing permit stays in effect until a new permit is effective. EPA expects to issue the final rule in 2024. Thus, even if these new ELG requirements were implemented into NPDES permits in a timely manner, the vast majority of SI decant and dewatering wastewater would have been discharged pursuant to BPJ determinations in existing permits rather than pursuant to any regulations EPA might promulgate.

EPA proposes that a BPJ approach for permitting legacy wastewater would result in reasonable further progress toward the CWA's goal of eliminating the discharge of all pollutants because it would allow permitting authorities to impose more stringent limitations (including potentially zero-discharge limitations) based on technologies that remove more pollutants than surface impoundments on a case-by-case basis, depending on what is technologically available and economically achievable for individual facilities.

EPA solicits comment on the proposed approach of continuing the current practice of case-by-case BPJ for determining BAT for legacy wastewater. EPA also solicits comment on explicitly establishing BAT equal to BPJ in the text of the regulations in a manner consistent with CWA section 304(b)(2)(B), 33 U.S.C. 1314(b)(2)(B) and 40 CFR 125.3(d).

b. B. Less Stringent Technologies Than BPJ

EPA is not proposing surface impoundments as the BAT basis for control of legacy wastewater discharges because there are technologies more stringent than surface impoundments that could be used at some plants. Thus, to make reasonable further progress as required by the CWA, EPA is proposing a case-by-case BAT approach rather than defaulting to the BPT technology basis for the wastestreams implicated here. This is in keeping with the Fifth Circuit's order vacating the 2015 legacy wastewater BAT limitations, which were set equal to previously established BPT limitations based on surface impoundments, in *Southwestern Elec. Power Co.* v. *EPA,* 920 F.3d at 1018.

c. C. More Stringent Technologies and Solicitation of Comments on Potentially Different Limitations for a Subset of Legacy Wastewater

EPA is not proposing more stringent technologies, such as chemical precipitation, biological treatment, membrane filtration, thermal evaporation, and/or spray dryer evaporation as the BAT basis for controlling discharges of legacy wastewater. EPA is not certain that these systems can be used nationwide on the vast array of legacy wastewaters that exist at steam electric plants without disrupting some plants' already commenced (and contracted for) closure process, thereby possibly jeopardizing the ability of those plants to meet their closure deadlines under the CCR rule. However, EPA is soliciting comment on limitations based on chemical precipitation, biological treatment, membrane filtration, thermal evaporation, and/or spray dryer evaporation or any other more stringent technologies that plants may be using to dewater their surface impoundments. EPA is especially interested in information related to the technological availability, economic achievability, and non-water quality environmental impacts of such technologies. Since these wastewaters are the same wastewaters as those regulated elsewhere in Part 423, EPA solicits comment on whether the Agency could transfer limitations, specifically any of the 2015 or 2020 limitations for FGD wastewater (including subcategories or VIP) or the proposed zero-discharge limitations.

Finally, EPA solicits comment on whether any presumptive standard or other appropriate constraint should be placed on any BPJ analysis should the Agency finalize a case-by-case BPJ approach. Even if EPA's final rule adopts a BPJ standard for deriving BAT limitations for legacy wastewater, recognizing that the wastewater contained in surface impoundments can vary across sites in the country, EPA could expect permitting authorities to thoroughly assess the technologies a plant already uses (including for treatment of other wastewaters) to determine whether the legacy wastewater could be directed to those systems for treatment. This would presumably represent an acceptable application of BPJ at the plant. For example, if a facility has installed and already uses an SDE to treat its FGD wastewater, then it would be reasonable for the permitting authority to find such technology to be technologically available and economically achievable to treat legacy wastewater that exists in a surface impoundment designed to store legacy FGD wastewater.

In contrast to most surface impoundments, EPA has identified 22 surface impoundments at 17 facilities that the record indicates are composite lined and meet the location restrictions of the CCR rule. A further discussion of these surface impoundments can be found in *Legacy Wastewater at CCR Surface Impoundments* (SE10252). Since these surface impoundments continue to operate, they would likely not begin closure and dewatering until after the effective date of any final rule. Thus, these surface impoundments do not present the same issue as the surface impoundments which have commenced, or imminently will commence, closure. A further discussion of these surface impoundments and the corresponding costs and pollutant loadings associated with candidate technologies for a potential BAT basis can be found in *Legacy Wastewater at CCR Surface Impoundments* (SE10252). EPA solicits comment on whether the Agency should establish a subcategory or different limitations applicable to discharges of these wastewaters. EPA solicits comment on what the subcategory could look like, including what cutoff could be used to establish this subcategory, as well as whether the subcategory should apply to surface impoundments that have not triggered the cease receipt of waste and/or closure requirements of the CCR rule, to surface impoundments that have not yet begun the dewatering process, and to just the SI dewatering water where decanting has already begun or completed. Finally, EPA is currently developing a proposed CCR rule for legacy surface impoundments at inactive or retired power plants. EPA solicits comment on the universe of potential legacy surface impoundments under that rule that may become subject to any limitations established under a final ELG.

5. Clarification on the Interpretation of 40 CFR 423.10 (Applicability) With Respect to Inactive/Retired Power Plants and Solicitation of Comments on Potential Clarifying Changes to Regulatory Text

EPA is clarifying that part 423 applies to discharges of the proposed SI decant

[99] Indirect dischargers (those who discharge to POTWs) are subject to pretreatment standards that are directly implemented and enforceable. CWA section 307; 40 CFR part 403.



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and dewatering wastewaters at inactive/retired power plants because the discharge of these wastewaters ''result[s] from the operation of a generating unit.'' [100] Due to the potential expansion of the CCR rule closure requirements to cover inactive surface impoundments at inactive (*i.e.,* retired) plants, these surface impoundments will likely need to dewater and discharge legacy wastewater, specifically SI decant and dewatering wastewaters. Thus, EPA wishes to clarify the applicability of these proposed regulations at inactive/retired power plants.

On August 21, 2018, the U.S. Court of Appeals for the District of Columbia issued a decision in *Utility Solid Waste Activities Group, et al.* v. *EPA,* which vacated and remanded the CCR rule provision that exempted inactive impoundments at inactive facilities from the CCR rule requirements. As a first step to respond to the Court's order, EPA sought comments and data on inactive surface impoundments at inactive facilities in an advanced notice of proposed rulemaking (ANPRM) to help develop future regulations for these CCR units (85 FR 65015, October 14, 2020). This ANPRM also discussed the related research conducted to date, described EPA's preliminary analysis of that research, and sought additional data and public input on issues that may inform a future proposed rule.

As a result of the ANPRM, EPA's understanding of the potential universe of legacy surface impoundments has grown. Specifically, comments by Earthjustice *et al.* identified an estimated 170 surface impoundments and 47 landfills at 72 retired power plants in *Potential CCR Legacy Units (2021).*[101] EPA is currently evaluating this information, as well as comments submitted by states, local governments, environmental groups, tribes, and industry, as part of *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy Surface Impoundments* (RIN: 2050–AH14).[102] EPA notes that many of these 72 facilities were still operating for some or all of the period during which EPA performed its detailed study for the steam electric power generating industry, 2013 proposal, and 2015 final rule. The record includes no information that these wastewaters have changed during closure such that there is any difference between the types of wastes and wastewaters in these units as compared to units at active power plants.

EPA wishes to clarify the applicability of 40 CFR part 423 to inactive/retired plants because some may question whether the existing effluent guidelines apply to discharges from surface impoundments at inactive/retired plants. Because the existing requirements under the ELGs for legacy wastewater were based on the pollutant removals achieved by surface impoundments (*i.e.,* gravity settling), whether the rule applied or not did not make a practical difference in terms of the technology-based limitations for this wastewater. Should EPA finalize limitations for SI decant and dewatering wastewater at inactive/retired plants that are more stringent than those based on the treatment achieved by surface impoundments, it is important that permittees with the estimated 170 legacy surface impoundments at inactive/retired power plants understand EPA's interpretation of the rule's applicability.

EPA notes that the current applicability text in § 423.10 conditions applicability on whether a discharge is ''resulting from the operation of a generating unit.'' Generally, when a plant ceases electricity production and retires, it either turns off, removes, or demolishes wastewater equipment such as intakes, cooling towers, pumps, and other equipment related to power generation. Thus, EPA expects that most wastewaters would no longer be generated and, therefore, no longer discharged. In contrast, some wastewaters, such as stormwater, will clearly continue to be generated and discharged after retirement, but cannot be said to result from the operation of an EGU. Between these two groupings of wastewaters lay wastewaters that, but for the operation of the generating unit, would not have been generated and discharged. Specifically, the proposed SI decant and dewatering wastewaters (legacy wastewaters) can be generated years in advance and retained in surface impoundments, either at the surface of the unit or in its pore water.

The interpretation above is consistent with EPA's long-time view on the applicability of part 423 to inactive/retired plants and consistent with implementation by state permitting authorities. For example, in 2016, South Carolina DHEC reissued a permit to the South Carolina Electricity & Gas Company's Canadys Station Site (SC0002020) which stated, ''Because electricity is not being generated, 40 CFR part 423—Steam Electric Power Generating Point-Source Category will only apply to the discharge of legacy wastewaters.'' [103]

In summary, EPA interprets the rule to apply to legacy wastewater at inactive/retired steam electric power plants. EPA solicits comment on whether § 423.10 should be amended to further support such a clarification with respect to legacy wastewater or whether the existing regulatory text already sufficiently supports this interpretation. In particular, the current applicability provision means that discharges of legacy wastewater that occur after the unit has ceased generating still ''result from'' the operation of the generating unit because *but for* the operation of the generating unit, there would be no subsequent discharge.

EPA solicits comment on whether there are other wastewaters that may continue to be discharged after the retirement of a facility and the generation of electricity is the ''but for'' cause of the discharge. EPA solicits comment on whether the Agency should clarify its interpretation for any such wastewaters or modify the text of section 423.10 to further clarify applicability to these wastewaters. For example, EPA solicits comment on whether CRL generated after retirement should continue to remain subject to 40 CFR part 423. Finally, EPA solicits comment on whether there are wastewaters at retired power plants that the Agency should clarify are explicitly excluded from the applicability of 40 CFR part 423.

### *C. Proposed Changes to Subcategories*

In the 2015 rule, EPA established subcategories for small EGUs (less than or equal to 50 MW nameplate capacity) and oil-fired EGUs. In the 2020 rule, EPA established additional subcategories for high FGD flow facilities, LUEGUs, and EGUs permanently ceasing coal combustion

[100] 40 CFR 423.10 Applicability. The provisions of this part apply to discharges resulting from the operation of a generating unit by an establishment whose generation of electricity is the predominant source of revenue or principal reason for operation, and whose generation of electricity results primarily from a process utilizing fossil-type fuel (coal, oil, or gas), fuel derived from fossil fuel (*e.g.,* petroleum coke, synthesis gas), or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium. This part applies to discharges associated with both the combustion turbine and steam turbine portions of a combined cycle generating unit.

[101] Available online at: *www.regulations.gov/comment/EPA-HQ-OLEM-2020-0107-0073.*

[102] EPA is currently evaluating potential legacy surface impoundments and intends to include a more refined estimate in its upcoming proposal.

[103] DHEC (Department of Health and Environmental Control). 2016. *FACT SHEET AND PERMIT RATIONALE: South Carolina Electric & Gas Company, Canadys Station Site.* NPDES Permit No. SC0002020. May 16.



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by 2028. For these subcategorized units, EPA established differentiated limitations with different technology bases from the remaining steam electric point source category. EPA has authority in a national rulemaking to establish different limitations for different plants after considering the statutory factors listed in section 304(b). *See Texas Oil & Gas Ass'n* v. *EPA,* 161 F.3d 923, 938 (5th Cir. 1998) (stating that the CWA does not ''exclude a rule allowing less than perfect uniformity within a category or subcategory.'').

EPA is not proposing to eliminate the 2015 rule subcategorization of small EGUs or oil-fired EGUs. Furthermore, while the Agency is soliciting comment on the permanent cessation of coal combustion subcategory, it is also not proposing to eliminate this 2020 rule subcategorization. However, EPA is proposing to remove both the high FGD flow and low utilization 2020 rule subcategories. EPA is also proposing a new subcategory for early adopters which permanently cease coal combustion by December 31, 2032. These subcategories are discussed below.

1. Plants With High FGD Flows

EPA is proposing to eliminate the high FGD flow subcategory. EPA proposes that, after evaluating the factors specified in CWA section 304(b)(2)(B), the subcategory is no longer warranted. In the 2020 rule, EPA evaluated one facility, TVA Cumberland, when it established the high FGD flow subcategory. At the time, this facility was found to have the highest costs due to its high FGD flows. Several commenters on the 2019 proposal claimed that this subcategory of one facility was inconsistent with the CWA, and further contested that the costs estimated for TVA were overestimated and not disparate.[104] EPA acknowledges that its cost estimates were higher than TVA's own estimates for installing biological treatment, and thus costs may not be as disparate as indicated in the 2020 rule. Nevertheless, EPA need not reach a determination on these costs as TVA has since issued a **Federal Register** notice for plans to retire the facility, which are further detailed in a draft Environmental Impact Statement (EIS) (86 FR 25933. May 11, 2021). This draft EIS solicits comment on three alternatives, all of which include retirement but with different electricity replacement scenarios.

EPA bases this proposal principally on TVA's primary decision to permanently cease coal combustion at the Cumberland plant. Because all the alternatives TVA is considering (including its preferred alternative) would result in the plant's retirement, EPA proposes to eliminate the 2020 rule high FGD flow subcategory as unnecessary. EPA solicits comment on the 2020 basis of disparate costs used to subcategorize this facility in the first place. Since this subcategory consists of only mercury and arsenic limitations based on chemical precipitation, EPA also solicits comment on whether, should TVA step back from its retirement plans, elimination of the subcategory would still be warranted.

2. Low Utilization EGUs (LUEGUs)

EPA proposes to eliminate the low utilization subcategory after evaluating the factors specified in CWA section 304(b)(2)(B) and based on EPA's proposed finding that the subcategory is no longer warranted. EPA proposes that the low utilization subcategory is no longer warranted given that only one plant has expressed an interest in availing itself of the BAT limitations in the subcategory, and the concerns EPA originally sought to address by creating the subcategory are not present for that plant. EPA established the subcategory for LUEGUs in the 2020 rule based on cost (disparate capital costs), non-water quality environmental impacts (including energy requirements), and other factors the Administrator deemed appropriate (*i.e.,* harmonization with CAA and RCRA regulations that apply to electric utilities). Any facility seeking subcategorization of one or more EGUs as an LUEGU was required to submit a NOPP to the permitting authority by October 13, 2021. While EPA did not perform a comprehensive search for NOPPs, EPA's large collection of NOPPs across several states (described above in Section VI.B of this preamble) only included one submission for participation in the LUEGU subcategory from a direct discharger. This submission was for EGUs at the GSP Merrimack Station in Bow, New Hampshire. This plant is discussed below.

Merrimack Station has two EGUs (MK1 and MK2). Although these units were once baseload generating units, over approximately the last 10 years, these units have transitioned to only operating intermittently when needed, primarily during winter and (even less frequently) summer months when natural gas supplies are constrained. As provided in Merrimack Station's 2021 NOPP, MK1 has a nameplate capacity of 113.6 MW and in 2019 and 2020 had capacity utilization factors (CUFs) of 6.6 percent and 3.6 percent, respectively. MK2 has a nameplate capacity of 345.6 MW and had 2019 and 2020 CUFs of 7.8 percent and three percent, respectively.

Following Merrimack Station's request for permit modification to incorporate the 2020 steam electric ELGs for both its BA transport water and FGD wastewater, the facility submitted a timely NOPP. In its NOPP, the facility requested coverage under the low utilization subcategory for both wastestreams, as well as the ability to transition to the 2020 rule subcategory for permanent cessation of coal combustion by 2028 or the 2020 rule VIP for its FGD wastewater, pursuant to 40 CFR 423.13(o). EPA acknowledges the facility's request to participate in the low utilization subcategory but to have the flexibility to potentially shift to operate under another subcategory or the VIP, as allowed by the 2020 rule.

However, EPA does not think the subcategory is warranted for this plant because the facility has already installed an advanced FGD wastewater treatment system capable of meeting the limitations in this proposed rule, and thus is not expected to incur any capital costs, let alone disparate costs, to meet the proposed FGD wastewater limitations. Moreover, the facility operates in a capacity futures market that helps offset the financial challenges potentially faced by a facility that operates at a reduced capacity. Because the cost/financial concerns EPA discussed in the 2020 rule are not present for this facility, EPA also proposes to find that there are no grid reliability concerns with eliminating this subcategory.

After an initial startup period,[105] Merrimack Station has operated since 2012 with zero discharges of its FGD wastewater. To operate with zero discharge, the plant has both a primary and secondary wastewater treatment system. The primary system consists of equalization tanks, reaction tanks, a softener, gravity filters, an enhanced mercury and arsenic removal system, and a holding tank. The secondary wastewater treatment system, referred to by the facility as the vapor compression evaporation system, generally consists of a brine concentrator, two crystallizers, and a belt filter press. Although the plant has operated with

[104] EPA notes that these commenters were also petitioners in the consolidated *Appalachian Voices* case discussed in Section IV of this preamble above.

[105] The wet scrubbers became operational on September 28, 2011. For approximately two years, while the treatment system was being adjusted and optimized, wastewater was periodically hauled off-site to local POTWs for disposal.



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zero discharge, in its most recent permit application, the plant at one point requested authorization to discharge FGD wastewater, but later withdrew the request. While technically the anti-backsliding provisions of 40 CFR 122.44(l) do not apply to Merrimack's FGD wastewater (since it has never had a limitation in its permit), the current permit does not allow FGD wastewater discharges and thus the permit would effectively become less stringent through the application of the low utilization subcategory, which would allow such discharges. Where a technology has already been in use at a facility for a decade and has been shown to be available and economically achievable for that facility, with acceptable non-water quality environmental impacts, relaxing a permit so use of that technology can be discontinued is inconsistent with the statute's BAT provisions intended to make reasonable further progress toward eliminating discharges into U.S. waters.[106]

Furthermore, Merrimack Station receives a production-independent revenue stream in the form of payments from the Independent System Operator (ISO) New England region's capacity futures markets. These competitive markets were designed to ensure sufficient capacity and reliability for the New England grid as described by ISO New England:

> The Forward Capacity Market (FCM) ensures that the New England power system will have sufficient resources to meet the future demand for electricity. Forward Capacity Auctions (FCAs) are held annually, three years in advance of the operating period. Resources compete in the auctions to obtain a commitment to supply capacity in exchange for a market-priced capacity payment. These payments help support the development of new resources. Capacity payments also help retain existing resources. For example, they incentivize investment in technology or practices that help ensure strong performance. They also serve as a stable revenue stream for resources that help meet peak demand but don't run often the rest of the year.[107]

In 2019, an independent estimate suggested that, between 2018 and 2023, Merrimack Station would receive approximately $189 million in these capacity market payments.[108] Thus, the plant is in a different financial situation than the other plants discussed in the 2020 rule record, which EPA was concerned would be forced to prematurely retire due to costs associated with the rule and reduced utilization and which, as a result, would potentially impact grid reliability. Furthermore, the fact that several of the plants that EPA estimated would participate in the low utilization subcategory in the 2020 rule record have since retired despite the flexibility of the subcategory and without causing grid reliability problems suggests that EPA may have overestimated both the financial viability of these plants and the threat of reliability issues. Since Merrimack Station also requested the ability to transfer to limitations for the permanent cessation of coal combustion subcategory for its discharges of both FGD wastewater and BA transport water, it is also possible that regardless of any flexibilities EPA affords, the plant is headed toward retirement. EPA notes that the ISO New England's last two Forward Capacity Auctions show a downward trend of reduced capacity commitments for Merrimack Station.

With respect to BA transport water, Merrimack Station does not have a dry handling or high recycle rate system. The plant has an unlined boiler slag pond that is also used to accept other wastestreams from around the plant. The utility represented to EPA Region 1 permitting staff that this surface impoundment was not subject to the CCR rule. EPA plans to further evaluate this issue, but for purposes of estimating costs for this rule, EPA is currently relying on the facility's representation and has included costs of BA conversion in its analysis. Working with EPA Region 1 permitting staff, Merrimack Station previously represented that it could achieve zero discharge through construction of a new remote MDS system by 2022.[109] Furthermore, this system was estimated to cost $14.9 million at most.[110] Given the timing of this proposal, Merrimack Station's representations about what date it could achieve zero discharge and cost of the relevant BA system are no longer accurate. EPA now conservatively estimates the raw capital costs of a closed-loop system to be over $26 million. Of this, approximately $22 million would be for the installation of a remote MDS and associated equipment, while approximately $4 million would be capital costs to achieve complete recycle. As discussed in Section VII.B.2 of this preamble, the over $4 million in capital costs to close the loop may be unnecessary or overstated, and EPA has incorporated these cost estimates into its consideration of cost and economic achievability for BA transport water BAT limitations.

After considering the record discussed above, EPA proposes to remove the 2020 rule low utilization subcategory. The record now indicates that there has been only one facility seeking to avail itself of low utilization discharge limitations for FGD wastewater, and that single facility already has zero discharge treatment equipment in place. Thus, it is not appropriate to continue the subcategory for this wastewater, as there are no disparate capital costs, no unacceptable non-water quality environmental impacts (including potential grid reliability impacts), and no need to allow this facility to otherwise discontinue use of its very efficient pollution treatment equipment to ''harmonize'' with other regulations. EPA solicits comment on whether any additional facilities with FGD wastewater have submitted NOPPs for the low utilization subcategory of which the Agency is not aware.

Finally, EPA does not think that Merrimack Station's costs (*e.g.,* in installing and operating a technology to meet the proposed BA transport water limitations), even if higher, warrant a special subcategory, given that this facility receives a production-independent revenue stream in the form of payments from New England's capacity futures markets. EPA is continuing to examine whether the plant's unlined slag settling pond is ''a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR.'' [111] Should the slag settling pond meet this definition, the unlined status of this pond would mean the facility is obligated under the CCR rule to cease receipt of waste in the surface impoundment and construct an alternative BA handling system, eliminating any potentially disparate

[106] This plant is arguably one of the best performing plants in the industry with respect to its FGD wastewater, further supporting that subcategorization is not appropriate.

[107] *See www.iso-ne.com/markets-operations/markets/forward-capacity-market/.*

[108] *See www.concordmonitor.com/merrimack-station-bow-nh-28840181.*

[109] *See* January 30 email from Linda Landis, available online at: *www3.epa.gov/region1/npdes/merrimackstation/pdfs/ar/AR-1513.pdf.* After EPA announced its reconsideration of the 2015 steam electric rule in 2017, the facility announced it would halt any efforts toward achieving zero discharge of its BA transport water pending revision of the rule. *See* April 20 letter from Linda Landis, available at: *www3.epa.gov/region1/npdes/merrimackstation/pdfs/ar/AR-1362.pdf.* Ultimately, EPA issued a renewed NPDES permit for Merrimack Station in 2020 with a zero discharge BA transport water limitation to be achieved by December 31, 2023.

[110] See *www3.epa.gov/region1/npdes/merrimackstation/pdfs/final/merrimack-final-rtc-ch-5.pdf.*

[111] 40 CFR 257.53.



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capital costs associated with meeting potentially more stringent BA transport water limitations. Even if the pond is not subject to the CCR rule, EPA questions whether there would be disparate costs for treating BA transport water at Merrimack Station, which receives capacity market payments designed specifically to allow the plant to stay in operation for reliability purposes, even though its operating costs may not otherwise be recouped by the plant's low sales without those payments. EPA further notes that, while courts have upheld subcategorization based on consideration of statutory factors, courts have also upheld BAT based on consideration of the point source category as a whole. *See Texas Oil & Gas Ass'n et al.* v. *EPA,* 161 F.3d 923, 928 (5th Cir. 1998) (''[I]n promulgating ELGs, EPA must set discharge limits reflecting best available technology that EPA determines to be economically feasible across the category or subcategory as a whole.'').

Finally, EPA solicits comment on the level of recycling that this plant's BA transport water system could employ, with or without additional modifications to the plant. For example, in the 2020 rule record, NRG Energy suggested that it would be able to recycle all its BA transport water from an existing surface impoundment system by merely changing the flow of existing sumps. Should comments demonstrate that Merrimack Station's two EGUs are necessary for reliability, that the slag settling pond is not a CCR surface impoundment, and that the costs for upgrading BA transport water systems are too great to bear in light of the unique circumstances above, EPA also solicits comment on whether the LUEGU subcategory should be retained only for BA transport water and/or for plants with a lower capacity utilization rate (CUR).[112] Finally, EPA solicits comment on whether future LUEGUs should be subcategorized such that they must only achieve the 2020 rule BAT limitations for FGD wastewater, which would still be less costly than the zero-discharge limitations of the current proposal.

3. EGUs Permanently Ceasing Coal Combustion by 2028

After evaluating the record, and to help establish certainty for the regulated community, EPA proposes to: maintain the subcategory for EGUs permanently ceasing coal combustion by 2028 for the reasons discussed below, modify reporting and recordkeeping requirements, clarify how limitations should be written into permits, and extend the period to file the initial notice of planned participation.

a. The Subcategory Continues To Be Warranted

EPA proposes that, after evaluating the factors specified in CWA section 304(b)(2)(B), the subcategory continues to be warranted. EPA established this subcategory in the 2020 rule based on the statutory factors of cost (the cost burden on these facilities is greater because they have less time to recoup investments); the age of the equipment and plants involved (the remaining useful life of the plants and their pollutant control equipment is shorter than for typical plants); potential non-water quality environmental impacts, including energy requirements (early retirement of these plants could affect energy supply); and harmonization with the CCR rule alternative closure provisions. EPA continues to find that these factors weigh in favor of the subcategory but solicits comment on several issues, as detailed below.

With respect to cost and age, the 2020 rule record included an analysis showing that amortization of capital costs for less than the typical 20-year life of pollution control equipment leads to disparate annualized costs until after about eight years, which at the time was 2028. Many plants made decisions at the time of the 2020 rule to opt for the alternative retirement compliance pathway, and they are now several years into meeting the milestones for that path.

Similarly, with respect to non-water quality environmental impacts, including energy requirements, a review of new information continues to support this subcategory in some instances. First, utilities have planned and budgeted for replacement capacity under timelines approved by public utility commissions (PUCs) and public service commissions (PSCs) as part of the normal integrated resource planning process. These submissions were made since the 2020 rule, as part of the 2020 rule's eight-year window to permanently cease coal combustion. EPA does not think it should disrupt these ongoing plans by changing the date. There will continue to be some plants for which replacement capacity is not an issue due to excess reserve margins, and others where replacement capacity is still necessary but changes in the power sector (including the Inflation Reduction Act) may allow for replacement capacity to be constructed more quickly. That said, EPA thinks that maintaining the same timeframe allowed by the prior rule supports efforts planned as a result of the 2020 rule and weighs in favor of retaining the same date in a revised rule.

Second, with respect to air pollution, EPA notes that several utilities have accelerated their retirement of coal-fired power plants and construction of replacement capacity. For example, the DTE filed a NOPP for this subcategory for its Belle River Power Plant and is accelerating the plant's retirement from 2030 to 2028. Replacing coal-fired capacity with natural gas, renewables, and other sources leads to decreased emissions of several air pollutants. The subcategory allows utilities already seeking to accelerate retirements to do so and achieve the associated air pollution reductions (a non-water quality environmental impact), which further supports the proposed finding that the subcategory continues to be warranted.

In addition, EPA still wishes to harmonize this rule with the CCR rule alternative closure provisions, which have not changed. Twenty-five plants are seeking to use the CCR rule's alternative closure provisions, which allow for closure of the unlined impoundment(s) and the power plant no later than 2023 (for surface impoundments under 40 acres) or 2028 (surface impoundments over 40 acres).[113] Elimination of the permanent cessation of coal combustion subcategory from this ELG could potentially interfere with the plans of utilities with surface impoundments in the 2028 category, complicating their compliance with the CCR rule. Furthermore, EPA has also solicited comment on a corresponding flexibility under the proposed Good Neighbor Plan, discussed in Section IV.E.2.a of this preamble, above.[114] Harmonization between regulations on air, water, and land pollution gives industry certainty to plan and implement these requirements in an orderly, efficient manner.

Finally, EPA notes that even if the permanent cessation of coal combustion subcategory were eliminated in a final

[112] For example, in comments provided during state and local government consultations, IMPA suggested a seven percent CUR.

[113] Further information is available online at: *www.epa.gov/coalash/coal-combustion-residuals-ccr-part-implementation.*

[114] ''To facilitate a potentially economic and environmentally superior unit-level compliance response across these programs that nonetheless maintains the $NO_X$ reductions required by the state budgets from 2026 forward in this proposal, EPA is requesting comment on potentially deferring the application of the backstop daily rate for large coal EGUs that submit written attestation to EPA that they make an enforceable commitment to retire by no later than the end of calendar year 2028.'' 87 FR 20036, 20122 (April 6, 2022).



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rule, it is unlikely to result in more stringent limitations in time to affect these plants. As discussed elsewhere in this proposal, EPA intends to issue a final rule in 2024, and the rule's requirements would not be implemented for direct dischargers until permitting authorities issue new permits incorporating those limitations. Since permits are typically not immediately reissued upon promulgation of a new rule, and the rule would likely allow some time to accomplish the new more stringent requirements as soon as possible, but not later than approximately five years after promulgation (*i.e.,* no later than December 31, 2029), it is likely that the 2028 permanent cessation of coal combustion date would have passed before a new ''no later than'' date under a new permit implementing the rule. Furthermore, in many cases, retirements and fuel conversions are planned to be completed well before 2028, with some already having occurred. After considering all the information above, EPA proposes that the consideration of the factors that led to the creation of this subcategory in the 2020 rule not only continues to weigh in favor of subcategorization but may be stronger than at the time of the 2020 rule. Thus, EPA proposes to retain this subcategory in its current form.

EPA solicits comment on the proposal to retain the subcategory. EPA also solicits comment on additional information that would suggest eliminating the subcategory, selecting a more stringent BAT for the subcategory, or specifying that BAT should be determined by the permitting authority on a case-by-case, BPJ basis. EPA explicitly solicits comment on a constrained BPJ approach whereby the permitting authority could require more stringent limitations where a facility has previously installed technologies that were designed to achieve pollutant removals beyond those achievable with surface impoundments, or alternatively, limitations based specifically on the more advanced technologies that a facility has previously installed. EPA is interested in whether these alternate approaches might better achieve the goals of the CWA, which requires reasonable further progress toward the elimination of discharges.

b. Clarification of Existing Limitations

As a clarification of how existing limitations should be written into permits, EPA also proposes to explicitly require permitting authorities to include in these sources' permits limitations requiring zero discharge of FGD wastewater and BA transport water after December 31, 2028, to ensure that permit requirements accurately reflect that no discharges of these wastewaters are allowed after the cessation of coal combustion date applicable to the subcategory. If the plant fails to cease combustion of coal by 2028 for any reason other than those specified in section 423.18, the zero-discharge limitations would automatically apply. These provisions are costless, and merely clarify the intent that plants which get the benefit of this subcategory do so because they will no longer discharge after 2028. To help ensure that facilities benefitting from less stringent requirements between the effective date of any final rule and the closure date are truly going to meet the deadline for participation in the subcategory, EPA is proposing to add this requirement.

*Proposal to Extend NOPP Filing Deadline Should EPA Receive Adverse Comment and Withdraw Related Direct Final Rule.* Utilities have continued to assess and consider plans for plants and EGUs as part of their normal integrated resource planning process. ''Representatives from Utilities and trade associations suggested that these continued evaluations have led additional facilities to seek accelerated retirement or fuel conversion of coal-fired power plants beyond those for which NOPPs were filed by the 2020 rule's October 13, 2021, deadline. Having not filed a NOPP by the 2021 deadline, such facilities would be forced to incur capital expenditures to install technologies to meet the 2020 rule limitations, thus receiving disparate treatment from those who filed a NOPP by October 13, 2021. EPA is proposing to change the NOPP filing date to 60 days after publication of a final rule. However, the Agency notes that following the public comment period and time to consider any comments on this issue, EPA would likely be unable to finalize a rule earlier than summer 2023, which would leave industry without certainty that plants that had not previously filed NOPPs might still be able to avail themselves of the 2020 subcategory for plants ceasing coal combustion by 2028. Given the lead times necessary to procure and install 2020 rule-compliant technologies (*e.g.,* biological treatment), the regulated community would benefit from certainty that such a provision will be finalized much sooner than summer 2023 to guarantee that unnecessary costs can still be avoided.[115] Thus, separately from this proposed rule, EPA is publishing a related direct final rule that changes the date of the NOPP filing to June 27, 2023, which will take effect on May 30, 2023 assuming EPA does not receive any adverse comments on the direct final rule. As described in the direct final rule, any adverse comment on the direct final rule must be received by April 28, 2023 if the commenter wishes to keep the direct final rule from taking effect.

While EPA is promulgating a direct final rule to extend the NOPP deadline to June 27, 2023, EPA is through this proposal also proposing to extend the NOPP deadline to 60 days after publication of a final rule. Thus, if EPA receives adverse comment on the direct final rule within 30 days of publication and subsequently withdraws that rule, the Agency still has the option of finalizing its proposal to extend the NOPP filing deadline. It is possible that EPA could take final action on this aspect of the rule prior to the rest of the proposed rule. If EPA does not receive adverse comment on the direct final rule and it takes effect, then the Agency would not plan to finalize this aspect of the proposal. In connection with the proposal to extend the NOPP filing deadline to 60 days after publication of a final rule, EPA solicits comment on briefly extending the NOPP filing deadline to allow for these additional retirements and fuel conversions to qualify for treatment under this subcategory. EPA solicits comment on specific information suggesting that specific plants or EGUs not the subject of a previously filed NOPP would consider permanently ceasing coal combustion by December 31, 2028. This could include new integrated resource plans, new retirement announcements, or other similar information. EPA solicits comment on whether a different NOPP filing deadline is appropriate and information demonstrating why. Any comments on this aspect of this proposal should clearly state that they are being made in response to the proposed extension of the NOPP filing deadline rather than on the direct final rule being published elsewhere in this issue of the **Federal Register**.

c. Additional Reporting and Recordkeeping Requirements

For a discussion of additional reporting and recordkeeping requirements, see Section XV.C.1 of this preamble.

[115] EPA notes that, given the timeframes for procurement and installation of 2020 rule-compliant technologies presented in the 2020 rule record, utilities would have to start incurring expenses around the end of the comment period of this proposal to avoid the risk of noncompliance with the 2020 rule.



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4. Subcategory for Early Adopters Retiring by 2032

EPA is proposing a new subcategory for plants that have achieved compliance either with the 2015 or 2020 rule limitations on FGD wastewater and BA transport water by publication of this proposed rule, and which elect to retire no later than December 31, 2032. EPA further proposes to explicitly require, as a condition for being eligible for this subcategory, that permitting authorities include the BAT limitations (proposed here as zero discharge of FGD wastewater and BA transport water) in these sources' permits after December 31, 2032. This will ensure that permits accurately reflect that no discharges of these wastewaters are allowed after the cessation of coal combustion date applicable to the subcategory. If a plant fails to cease combustion of coal by 2032 for any reason other than those specified in section 423.18, the zero-discharge limitations would automatically apply. After evaluating the factors specified in CWA section 304(b)(2)(B), EPA proposes that such a subcategory is warranted on the basis of cost (disparate costs to facilities with these units), age (both the age of the new pollution treatment technology and the remaining useful life of the plant), non-water quality environmental impacts (air pollution), and other factors the Administrator deems appropriate (impacts to early adopters who relied on the identification of biological treatment as BAT for FGD wastewater in the 2015 and 2020 rules). For units in this subcategory, EPA proposes limitations based on the same technology bases for control of FGD wastewater and BA transport water in the 2020 rule, which EPA proposes are available, are economically achievable, and have acceptable non-water quality environmental impacts.

As discussed in Section IV of this preamble above, discharges from steam electric plants have been the subject of proposed and final regulations for the past decade, an unsurprising fact given this industry's long tenure among the top industrial point source discharges.[116] Some utilities and states pushed forward pursuant to the 2015 and 2020 rules with biological treatment and dry or closed-loop BA handling systems (even where these systems turned out to have a purge), and have achieved compliance with the limitations in those rules by the date of publication of this proposed rule. This proposal refers to those facilities as ''early adopters.'' In contrast, other utilities have avoided incurring any cost for as long as possible, and as a result may be better poised to adjust to today's more stringent proposal. Thus, EPA considered how the statutory factors may justify a balancing of these equities.

EPA gathered as much information as possible to consider when early adopter units might plan to close in order to qualify for this subcategory. With respect to disparate costs and age (remaining life of the EGU), EPA continued to gather information from publicly available sources, company announcements, industry public comments, and government databases to identify EGUs that may have already installed 2020 rule-compliant technologies. Many of these EGUs have already announced retirement by 2032 or soon thereafter.[117] EPA presents a list of such EGUs in Table VII–1 of this preamble below. As shown in the table, the record includes 15 EGUs at five plants that have already adopted technologies to comply with the 2015 or 2020 rules that may incur costs under the proposal without a subcategory for early adopters. Under Option 3, these EGUs combined have estimated capital costs of $51 million and estimated operations and maintenance (O&M) costs of $4 million per year. Under Option 4, these EGUs combined have estimated capital costs of $110 million and estimated O&M costs of $11 million per year. Thus, the costs for the rule more than double without subcategorization of these units. Furthermore, accounting for the remaining useful life of these EGUs, costs in many cases would be amortized over periods shorter than the assumed 20-year life of the equipment. As discussed in the 2020 rule record and above in the discussion for the subcategory for EGUs permanently ceasing coal combustion by 2028, amortization periods shorter than eight years may lead to disparate costs.

TABLE VII–1—EARLY ADOPTERS

| Plant name | SE Unit ID | Retire year | Capacity (MW) | Option 3 costs | | Option 4 costs | |
|---|---|---|---|---|---|---|---|
| | | | | Capital (2021$) | O&M (2021$) | Capital (2021$) | O&M (2021$) |
| Plant James H Miller Jr | SE Unit-1 | N/A | 706 | $0 | $0 | $4,700,000 | $130,000 |
| Plant James H Miller Jr | SE Unit-2 | N/A | 706 | 0 | 0 | 4,700,000 | 130,000 |
| Plant James H Miller Jr | SE Unit-3 | N/A | 706 | 0 | 0 | 4,700,000 | 130,000 |
| Plant James H Miller Jr | SE Unit-4 | N/A | 706 | 0 | 0 | 4,700,000 | 130,000 |
| Marshall Steam Station | SE Unit-1 | 2028 | 380 | 2,800,000 | 210,000 | 4,900,000 | 540,000 |
| Marshall Steam Station | SE Unit-2 | 2028 | 380 | 2,800,000 | 210,000 | 4,900,000 | 540,000 |
| Marshall Steam Station | SE Unit-3 | 2032 | 658 | 4,900,000 | 370,000 | 9,200,000 | 1,100,000 |
| Marshall Steam Station | SE Unit-4 | 2032 | 660 | 4,900,000 | 370,000 | 7,300,000 | 750,000 |
| Mountaineer Plant | SE Unit-1 | 2040 | 1,300 | 7,300,000 | 780,000 | 17,000,000 | 2,200,000 |
| Gallatin | SE Unit-1 | 2035 | 300 | 2,300,000 | 110,000 | 3,700,000 | 250,000 |
| Gallatin | SE Unit-2 | 2035 | 300 | 2,300,000 | 110,000 | 3,700,000 | 250,000 |
| Gallatin | SE Unit-3 | 2035 | 328 | 2,500,000 | 120,000 | 4,000,000 | 270,000 |
| Gallatin | SE Unit-4 | 2035 | 328 | 2,500,000 | 120,000 | 4,000,000 | 270,000 |
| Belews Creek Steam Station | SE Unit-1 | 2035 | 1,110 | 9,700,000 | 790,000 | 18,000,000 | 2,100,000 |
| Belews Creek Steam Station | SE Unit-2 | 2035 | 1,110 | 9,700,000 | 790,000 | 19,000,000 | 2,300,000 |
| *Total* | | | *9,675* | *51,000,000* | *4,000,000* | *110,000,000* | *11,000,000* |

**Note:** Totals may not add due to rounding.

With respect to non-water quality environmental impacts, including energy requirements, a review of new information supports the creation of this subcategory. Replacement of coal-fired capacity with natural gas, renewables,

[116] *See, e.g.,* Effluent Guidelines Plan 14/ Preliminary Effluent Guidelines Plan 15, available online at: *www.epa.gov/eg/effluent-guidelines-plan.*

[117] Even the one EGU with a retirement date of 2040 (Mountaineer Unit 1) recently contemplated retirement by 2028 when both Virginia and Kentucky rejected rate recovery for ELG-compliant upgrades to AEP's coal-fired power plants.



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and other sources leads to decreased emissions of several air pollutants, including GHGs. Thus, to the extent that the subcategory allows utilities already seeking to accelerate retirements in response to the Inflation Reduction Act and other factors the ability to do so and achieve the associated air pollution reductions (a non-water quality environmental impact), it further supports the proposed finding that the subcategory is warranted.

With respect to age (of pollution treatment equipment) and ''other factors'' the Administrator deems appropriate, EPA considered the impacts of expecting early adopters to meet new limitations based on technologies different than those identified as the technology bases in the 2015 and 2020 rules. As stated above, the ELGs for direct discharges are implemented in permits. Some facilities have diligently applied for and obtained permits implementing the 2015 or 2020 rules' limitations for FGD wastewater and BA transport water and installed technologies that meet those limitations. Several utilities have biological treatment that could meet the 2020 rule limitations. For example, Duke Energy made a fleetwide conversion to chemical precipitation plus biological treatment and ultrafiltration for its FGD wastewater, despite EPA's reconsideration of the 2015 rule. In part, continued investments in FGD wastewater treatment technologies by Duke and others were driven by permit limitations.[118] However, at least some of these plants relied upon EPA's continued determinations in the 2019 proposal and 2020 final rule that some form of biological treatment was still BAT for FGD wastewater. It is also worth noting that some of these utilities may not have been able to select more stringent technologies, even under the 2020 VIP, in part because PUCs/PSCs would not agree to this higher cost *unless* the more stringent limitations were legally required. Thus, several companies installed a technology unable to achieve the same zero-discharge limitations that the BAT basis proposed in Option 3 (chemical precipitation plus membrane filtration) can achieve. While some of these systems were installed over a decade ago and may have already achieved some payback, in other cases these systems are new and far from the end of their useful life. For this reason, it is appropriate for EPA to consider the additional cost associated with these early adopters having to meet a new set of limitations.

EPA notes that these same plants that have already incurred costs for FGD wastewater treatment technologies have also moved forward with converting previous surface impoundment-based BA transport water systems. These conversions often occurred due to a combination of the CCR and ELG rules. Nevertheless, in instances where a plant incurred capital costs to install a remote MDS, the plant may similarly face the task of adjusting this system to operate zero discharge for additional costs in conjunction with the costs of installing additional FGD wastewater treatment technologies. EPA notes that the costs to upgrade the BA handling system are typically relatively small, with EPA's conservative estimates of capital and O&M costs averaging approximately $4 million up front and $370,000 per year for each EGU. For this reason, EPA does not propose extending this subcategory to facilities with high recycle rate BA transport systems that have not also installed biological treatment or comparable systems for FGD wastewater.[119]

EPA solicits comment on several issues regarding this subcategory, including whether the subcategory is warranted based on the record. Many of the solicitations below are in direct response to suggestions from utilities and trade associations that were similar to, but contained differences from, the proposed subcategory. For example, EPA solicits comment on whether costs are disparate in light of the relatively higher utilization of some of these EGUs and the ability of utilities to lease the additional treatment stages necessary to meet any new limitations. EPA solicits comment on alternate cutoff dates the Agency could use for early adoption. For example, EPA could make the cutoff date earlier than publication of the proposed rule (*e.g.,* full compliance by the announcement of this rulemaking in 2021) or later (*e.g.,* any facility that had already entered into a binding contract by the signature date of the proposal).[120] EPA also solicits comment on whether early adoption should be required at all, or whether the Agency should merely include a new subcategory for retirement by 2032 rather than 2028, as discussed above. In the case of such a change, EPA solicits comment on the appropriate BAT limitations until that time. EPA also solicits comment on whether the early adopter subcategory should require a different date for the permanent cessation of coal combustion. EPA is undertaking rulemakings related to EGUs under the CAA and solicits comment on whether the permanent cessation of coal combustion date proposed here should be harmonized with any CAA rule that is ultimately promulgated. EPA solicits comment on whether the Agency should finalize an early adopter subcategory that would be available to early adopters of the 2015/2020 rule technology bases (or similar bases), whether they plan to retire by a certain date or not. Whether or not the subcategory is tied to retirement, EPA also solicits comment on whether the early adopter subcategory should be limited such that less stringent limitations based on 2015/2020 rule technologies would only be available to a plant until the capital investment of the previous technologies has been paid back. EPA solicits comment on whether, after a full payback period has passed, an early adopter should immediately be subject to any new, more stringent limitations. EPA also solicits comment on whether the Agency should allow participation in this subcategory if the plant is not retiring, but instead converting to other fuels (*e.g.,* natural gas), as was done in the 2020 rule for the EGUs permanently ceasing coal combustion by 2028 subcategory.

EPA solicits comment on whether this subcategory should be extended to facilities other than those that installed biological treatment or ZVI treatment for FGD wastewater. ZVI is an equivalent technology to biological treatment that several plants had identified could meet the limitations during the 2020 rulemaking but couldn't achieve zero discharge. Although EPA isn't aware of any completed installations of ZVI, the Agency does not wish to close the door on any facilities that had similar reliance interests but installed the competitor technology. EPA solicits comment on whether an early adopter subcategory should include facilities that have already met both the FGD wastewater and BA transport water limitations for the LUEGU or high FGD flow subcategory by any means, not by a specified treatment technology. EPA also solicits comment on whether the subcategory should include facilities that have only met the limitations for BA transport water because they have no FGD wastewater. If so, EPA solicits comment on whether it should require that early adopters for BA transport

[118] *See, e.g.,* water quality-based effluent limitations at Plant Miller (SE08188).

[119] Note that many facilities also meet existing 2020 FGD wastewater BAT limitations because they either do not generate or do not discharge FGD wastewater. This subcategory would not apply to such facilities.

[120] For an example of the latter approach, see 40 CFR 122.29(b)(4)(ii) as it relates to defining new sources.



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water actually incurred capital costs to install a remote MDS system rather than merely recycling wastewater through existing systems (*e.g.,* through surface impoundments). EPA also solicits comment on whether BA transport water should be included in the subcategory at all, or alternatively whether the subcategory should apply only to early adopters of FGD wastewater technologies.

*D. Additional Rationale for the Proposed PSES and PSNS*

Before establishing PSES/PSNS for a pollutant, EPA examines whether the pollutant ''passes through'' a POTW to WOTUS or interferes with the POTW operation or sludge disposal practices. In determining whether a pollutant passes through POTWs for these purposes, EPA typically compares the percentage of a pollutant removed by well-operated POTWs performing secondary treatment to the percentage removed by the BAT/NSPS technology basis. A pollutant is determined to pass through POTWs when the median percentage removed nationwide by well-operated POTWs is less than the median percentage removed by the BAT/NSPS technology basis. EPA establishes pretreatment standards for those pollutants regulated under BAT/NSPS that pass through POTWs.

EPA is continuing to rely on the pass-through analysis as the basis of the limitations and standards in the 2015 rule, which found that mercury and arsenic in CRL are not significantly removed by POTWs. As in the 2015 rule, EPA also did not conduct its traditional pass-through analysis for wastestreams with proposed zero-discharge limitations or standards. Zero-discharge limitations and standards achieve 100 percent removal of pollutants; therefore, all pollutants in those wastestreams treated by the proposed zero discharge technologies would otherwise pass through the POTW absent application of those technologies.

After considering all the relevant factors and technology options presented in this preamble and in the TDD, EPA is proposing to establish PSES for indirect dischargers based on the technologies described in Option 3. EPA is proposing the Option 3 technologies as the bases for PSES for the same reasons that the Agency is proposing the Option 3 technologies as the bases for BAT for direct dischargers.[121] EPA's analysis shows that, for both direct and indirect dischargers, the Option 3 technologies are available and economically achievable, and Option 3 has acceptable non-water quality environmental impacts, including energy requirements (*see* Sections VIII and X of this preamble). For the preferred option (Option 3), EPA is not proposing other technology bases for PSES for the same reasons that the Agency is not proposing other technology bases for BAT. Furthermore, for the same reasons that apply to EPA's proposed retention of differentiated BAT limitations for EGUs permanently ceasing coal combustion by 2028 and creation of differentiated limitations for early adopters, EPA proposes the same flexibilities in PSES under Option 3.

With respect to the low utilization subcategory, EPA proposes to eliminate the PSES subcategory for LUEGUs, as it does for direct dischargers, after considering specific facts for the lone indirect discharge from a LUEGU. EPA is only aware of one indirect discharger that has filed a NOPP to avail itself of this subcategory, the Whitewater Valley Station. Whitewater Valley Station consists of two EGUs (Coal Boiler #1 and Coal Boiler #2). Coal Boiler #1 has a nameplate capacity of 35 MW and a 2019 and 2020 CUR of five percent and 3.67 percent, respectively. Coal Boiler #2 has a nameplate capacity of 65 MW and a 2019 and 2020 CUR of 5.5 percent and 5.1 percent, respectively. On the IMPA website, the Agency states that the station ''has been utilized by IMPA during peak load periods during the hot summer months and cold winter months.'' [122] EPA notes that Coal Boiler #1 need not have been included in this facility's NOPP filing as this EGU is small enough to avail itself of the 2015 rule subcategory for small EGUs (*i.e.,* less than or equal to 50 MW nameplate capacity).

Whitewater Valley Station does not generate or discharge FGD wastewater but does generate BA transport, water which it has historically discharged indirectly through a POTW. According to comments filed during consultations with state and local government entities and associations, IMPA described a treatment chain it might utilize for this subcategory:

> ''Under the existing system, LUEGUs will be able to use gravity settling in surface impoundments to remove Total Suspended Solids (TSS). Low utilization subcategory EGUs then must develop and implement a best management practice (BMP) plan to minimize the discharge of pollutants from BA transport water. As an example, an IMPA facility that plans to apply the low utilization subcategory transports its BA transport water through a settlement and filtration system that removes TSS and other contaminants before discharging to the relevant POTW for treatment.'' [123]

EPA estimated this facility would need to employ two under-boiler MDS systems because of the CCR requirement to cease receipt of waste in the facility's unlined surface impoundments. However, the comment excerpted above (received after EPA had completed its analysis) suggests that has already taken, and possibly finalized, an alternative treatment system that is not zero discharge, given the CCR rule's April 2021 cease receipt of waste deadline.

Nevertheless, EPA proposes to eliminate the LUEGU subcategory for indirect dischargers. With respect to FGD wastewater under the LUEGU subcategory, no NOPPs were filed from indirect dischargers requesting this subcategory for this wastestream. Thus, continued existence of this subcategory is unnecessary. With respect to BA transport water, EPA has not evaluated costs for Whitewater Valley Station's Coal Boiler #2 for the reasons discussed above, but again notes that no costs would be imposed for Coal Boiler #1 as it could continue to discharge under the less stringent limitations in the 2015 subcategory for small units. Given the very low utilization of the two EGUs, EPA solicits comment on whether the peaking function of Whitewater Valley Station could continue by utilizing only Coal Boiler #1 after 2028 if the facility transitioned Coal Boiler #2 into the permanent cessation of coal combustion subcategory.[124] EPA also solicits comment on the specific pollution controls in place at the Whitewater Valley Station, as well as the levels of pollution reduction that system achieves both alone and in combination with the downstream POTW via which the facility discharges its BA transport water. For PSES, EPA also solicits comment on the same issues discussed in Section VII.C.2 of this preamble for direct dischargers. Finally, EPA solicits comment on whether the LUEGU subcategory should be retained for BA transport water for indirect dischargers only.

For purposes of the proposed PSES, EPA also proposes the same definitional changes for legacy wastewater that were

[121] Since Dallman has converted to a direct discharger (SE10256), EPA projects that the proposed PSES for FGD wastewater would not apply to any plants.

[122] *See www.impa.com/about-impa/generation-resources/giant-tcr.*

[123] Available online at: *www.regulations.gov,* Document ID: EPA–HQ–OW–2009–0819–9020.

[124] Note that small EGUs are not limited to a 10 percent CUR.



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proposed for BAT in Section VII.B.4 of this preamble. For the same reasons as the proposed BAT determination, EPA proposes to decline establishing a nationally applicable PSES for wastewater generated before the ''as soon as possible'' date, SI decant wastewater, and SI dewatering wastewater. The effect of not finalizing PSES for this set of wastewaters would mean that any pretreatment standards in addition to those set forth in 40 CFR part 403 would need to be established as local limits by the control authority.

*E. Availability Timing of New Requirements*

Where BAT limitations in the 2015 and 2020 rules are more stringent than previously established BPT limitations, those BAT limitations do not apply until a date determined by the permitting authority that is ''as soon as possible'' after considering four factors.[125] Depending on the particular wastewater, the 2015 and 2020 rules also established a ''no later than'' date of December 31, 2023, and/or December 31, 2025, for reasons discussed in the record of those rules, including that without such a date, implementation could be substantially delayed, and a firm ''no later than'' date creates a more level playing field across the industry.

As part of the consideration of the technological availability and economic achievability of the BAT limitations in this proposal, EPA considered the magnitude and complexity of process changes and new equipment installations that would be required for plants to meet the proposed rule's limitations and standards. Specifically, EPA selected the timeframes described above to enable many plants to raise needed capital, plan and design systems, procure equipment, and construct and test systems. EPA also considered the timeframes needed for appropriate consideration of any plant changes being made in response to other Agency rules affecting the steam electric power generating industry. EPA understands that some plants may have already installed, or are now installing, technologies that could comply with the proposed limitations. Therefore, EPA proposes that the earliest date some plants can achieve compliance with these new limitations would be the effective date of any final rule. Where this is not the case, nothing in this proposal would preclude a permitting authority from establishing a later date, up to the ''no later than'' date, after considering the four specific factors in 40 CFR 423.11(t).

With respect to the latest compliance dates, EPA collected updated information regarding the technical availability of the proposed technology bases. Information in EPA's rulemaking record indicates that a typical timeframe to raise capital, plan and design systems (including any necessary pilot testing), procure equipment, and construct and test systems falls well within the existing five-year permit cycle.[126] Furthermore, the chemical precipitation and zero discharge technologies proposed here do not implicate the same industrywide competition over a small number of biological treatment vendors that the 2020 rule implicated. EPA notes that while plants may not need approximately five years to comply with the proposed limitations, the ''no later than'' date creates an outer boundary beyond which no discharger may seek additional time and creates a level playing field regarding the latest date. Therefore, EPA proposes that any final limitations be achieved ''no later than'' December 31, 2029.

As with the proposed BAT effluent limitations, in considering the availability and achievability of the proposed PSES, EPA concluded that existing indirect dischargers need some time to achieve the final standards, in part to avoid forced outages. While the BAT limitations apply on a date determined by the permitting authority that is as soon as possible beginning on the effective date of any final rule (but no later than December 31, 2029), under CWA section 307(b)(1), pretreatment standards shall specify a time for compliance not to exceed three years from the date of promulgation, so EPA cannot establish a longer implementation period. Moreover, unlike requirements on direct discharges, requirements on indirect discharges are not implemented through NPDES permits. Nevertheless, EPA proposes to find that all existing indirect dischargers can meet the standards within three years of promulgation. There will be no remaining indirect dischargers of FGD wastewater by the time any final rule is promulgated. With respect to BA transport water, EPA estimates that a closed-loop system can achieve zero discharge within 35 months, and substantially sooner if a high recycle rate system is already operating.[127] Finally, with respect to CRL, EPA estimates the chemical precipitation systems can achieve the mercury and arsenic limitations within 22 months.[128] Thus, the proposed PSES technologies are available in the proposed timeframe. Further discussion of availability timing can be found in Section XV of this preamble.

*F. Economic Achievability*

As explained in detail in Section VIII of this preamble, below, EPA's analysis for the proposed BAT limitations and PSES demonstrates that they are economically achievable for the steam electric industry as a whole, as required by CWA section 301(b)(2)(A). EPA used IPM to perform cost and economic impact assessments, using a baseline that reflects impacts from other relevant environmental regulations (*see* RIA).[129] For the proposed rule, the model showed very small additional effects on the electricity market, on both a national and regional sub-market basis. Based on the results of these analyses, EPA estimated that the proposed rule requirements would result in a net reduction of 249 MW in steam electric generating capacity as of the model year 2030, reflecting full compliance by all plants. This capacity reduction corresponds to a net effect of approximately one EGU closure or, when aggregating to the level of steam electric generating plants, one early plant closure.[130] These IPM results support EPA's conclusion that the proposed rule is economically achievable.

*G. Non-Water Quality Environmental Impacts*

The proposed BAT limitations and PSES have acceptable non-water quality environmental impacts, including energy requirements. Section X of this preamble describes EPA's analysis of

[125] These factors are: (1) Time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of the final rule; (2) changes being made or planned at the plant in response to GHG regulations for new or existing fossil fuel-fired power plants under the Clean Air Act, as well as regulations for the disposal of coal combustion residuals under subtitle D of the Resource Conservation and Recovery Act; (3) for FGD wastewater requirements only, an initial commissioning period to optimize the installed equipment; and (4) other factors as appropriate. 40 CFR 423.11(t).

[126] *See* FGD and Bottom Ash Implementation Timing (SE08480).

[127] SE08480.

[128] SE10289.

[129] IPM is a comprehensive electricity market optimization model that can evaluate such impacts within the context of regional and national electricity markets. See Section VIII of this preamble for additional discussion.

[130] Given the design of IPM, unit-level and thereby plant-level projections are presented as an indicator of overall regulatory impact rather than a precise prediction of future unit-level or plant-specific compliance actions. The projected net plant closure occurs at a plant whose only steam electric EGU had a capacity utilization of only six percent in the baseline.



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non-water quality environmental impacts and energy requirements in more detail. EPA estimates that by 2029, under the proposed rule and reflecting full compliance, energy consumption would increase by less than 0.003 percent of the total electricity generated by power plants. EPA also estimates that the amount of fuel consumed by increased operation of motor vehicles (*e.g.,* for transporting waste) would increase by approximately 0.0005 percent of total fuel consumption by all motor vehicles.

EPA also evaluated the effect of the BAT effluent limitations on air emissions generated by all electric power plants ($NO_X$, $SO_X$, and $CO_2$), solid waste generation, and water usage. Under the proposed rule, depending on the year, $CO_2$ emissions are projected to decrease by 0.1 to 1.1 percent, $NO_X$ emissions are projected to decrease by 0.6 to 2.4 percent, and $SO_2$ emissions are projected to decrease by 0.2 to 3.9 percent due to changes in the mix of electricity generation (*e.g.,* less electricity from coal-fired steam EGUs and more electricity from natural gas-fired steam EGUs). Moreover, solid waste generation is projected to increase by less than one percent of total solid waste generated by all electric power plants. Finally, EPA estimates that the proposed rule will have a positive impact on water withdrawal, with steam electric power plants reducing the amount of water they withdraw by 4.33 billion gallons per year (11.8 MGD).

### *H. Impacts on Residential Electricity Prices and Low-Income and Minority Populations*

EPA examined the effects of the proposed rule on consumers as an additional factor that might be appropriate when considering what level of control represents BAT. If all annualized compliance costs were passed on to residential consumers of electricity instead of being borne by the operators and owners of power plants (a conservative assumption), the average yearly electricity bill increase for a typical household would be no more than $0.63 under the proposed rule. For further information see Chapter 7 of the RIA.

EPA also considered the effect of the proposed rule on minority and low-income populations. As explained in Section XVI of this preamble, using demographic data regarding who resides closest to steam electric power plant discharges, who fishes in downstream waterbodies, and who consumes drinking water from downstream drinking water treatment plants, EPA concluded that low-income and minority populations benefit to an even greater degree than the general population from the reductions in discharges associated with the proposed rule.

## VIII. Costs, Economic Achievability, and Other Economic Impacts

EPA evaluated the costs and associated impacts of the four regulatory options on existing EGUs at steam electric plants. These costs are analyzed within the context of existing environmental regulations, market conditions, and other trends that have affected steam electric plant profitability and generation, as described in Section V.B of this preamble. This section provides an overview of the methodology EPA used to assess the costs and the economic impacts and summarizes the results of these analyses. See the RIA in the docket for additional detail.

In developing ELGs, and as required by CWA section 301(b)(2)(A), EPA evaluates the economic achievability of regulatory options to assess the impacts of applying the limitations and standards to the industry as a whole, which typically includes an assessment of incremental plant closures attributable to a regulatory option. As described in more detail below, this proposed ELG is expected to result in incremental costs when compared to baseline. Like the prior analysis of the 2015 and 2020 rules, the cost and economic impact analysis for this proposed rulemaking focuses on understanding the magnitude and distribution of compliance costs across the industry and the broader market impacts. EPA used indicators to assess the impacts of the four regulatory options on the whole steam electric power generating industry. These indicators are consistent with those used to assess the economic achievability of the 2015 rule and 2020 rule. For this proposal, EPA compared the values to a baseline that reflects implementation of existing environmental regulations (as of this proposal), including the 2020 rule. As such, the baseline appropriately includes the costs of achieving the 2020 rule limitations and standards, and the policy cases show the impacts resulting from potential changes to the existing 2020 limitations and standards. More specifically, EPA considered the total cost to industry and change in the number and capacity of specific EGUs and plants expected to close under the proposed rule (Option 3) compared to baseline. EPA also analyzed the ratio of compliance costs to revenue to see how the four main regulatory options change the number of plants and their owning entities that exceed thresholds indicating potential financial strain. In addition to the analyses supporting the economic achievability of the regulatory options, EPA conducted other analyses to (1) characterize other potential impacts of the regulatory options (*e.g.,* on electricity rates) and (2) to meet the requirements of E.O.s or other statutes (*e.g.,* E.O. 12866, Regulatory Flexibility Act, Unfunded Mandates Reform Act).

### *A. Plant-Specific and Industry Total Costs*

EPA estimated plant-specific costs to control FGD wastewater, BA transport water, and CRL discharges at existing EGUs at steam electric plants to which the ELGs apply. EPA assessed the operations and treatment system components currently in place at a given unit (or expected to be in place because of other existing regulations, including the 2020 ELG rule), identified equipment and process changes that plants would likely make under each of the four regulatory options presented in Table VII–1 of this preamble, and estimated the capital and O&M costs to implement those changes. As explained in the TDD, the baseline also accounts for additional announced unit retirements, conversions, and relevant operational changes that have occurred since EPA promulgated the 2020 rule. Following the same methodology used for the 2015 and 2020 rule analyses, EPA used a rate of seven percent to annualize one-time costs and costs recurring on other than an annual basis. For capital costs and initial one-time costs, EPA used a 20-year amortization period. For O&M costs incurred at intervals greater than one year, EPA used the interval as the annualization period (*e.g.,* five years, 10 years). EPA added annualized capital, initial one-time costs, and the nonannual portion of O&M costs to annual O&M costs to derive total annualized plant costs. EPA then calculated total industry costs by summing plant-specific annualized costs. For the assessment of industry costs, EPA considered costs on both a pre-tax and after-tax basis.

Pre-tax annualized costs provide insight on the total expenditure as incurred, while after-tax annualized costs are a more meaningful measure of impact on privately owned for-profit entities and incorporate approximate capital depreciation and other relevant tax treatments in the analysis. EPA uses pre- and/or after-tax costs in different analyses, depending on the concept appropriate to each analysis (*e.g.,* social costs are calculated using pre-tax costs whereas cost-to-revenue screening-level


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analyses are conducted using after-tax costs).

Table VIII–1 of this preamble summarizes estimates of incremental pre- and post-tax industry costs for the four regulatory options presented in Table VII–1 of this preamble as compared to baseline. The after-tax annualized costs of the proposed rule (Option 3) are $181 million.

TABLE VIII–1—ESTIMATED TOTAL ANNUALIZED INDUSTRY COSTS

[Millions of 2021$, seven percent discount rate]

| Regulatory option | Pre-tax | After-tax |
|---|---|---|
| Option 1 .... | $102.4 | $81.1 |
| Option 2 .... | 189.0 | 149.0 |
| Option 3 .... | 230.5 | 181.2 |
| Option 4 .... | 241.3 | 189.6 |

*B. Social Costs*

Social costs are the costs of the proposed rule from the viewpoint of society as a whole, rather than the viewpoint of regulated plants and owning entities (which are private costs). In calculating social costs, EPA tabulated the pre-tax costs in the year they are estimated to be incurred, which varies across plants based on the estimated compliance year. EPA performed the social cost analysis over a 25-year period of 2025 to 2049, which combines the length of the period during which plants are anticipated to install the control technologies (which could be as late as 2029) and the useful life of the longest-lived technology installed at any plant (20 years). EPA calculated the social cost of the proposed rule using both a primary three percent discount rate and an alternative seven percent discount rate. Social costs include costs incurred by both private entities and the government (*e.g.,* in implementing the regulation).

As described further in Chapter 10 of the RIA, there were no incremental increases in the cost to state governments to revise NPDES permits. Consequently, the only category of costs used to calculate social costs are those pre-tax costs estimated for steam electric plants. Note that the annualized social costs presented in Table VIII–2 of this preamble for the seven percent discount rate differ from comparable pre-tax industry compliance costs shown in Table VIII–1 of this preamble. The costs in Table VIII–1 of this preamble represent the annualized costs of each option if they were incurred in 2024, whereas the annualized costs in Table VIII–2 of this preamble are estimated based on the stream of future costs starting in the year that individual plants are projected to comply with the requirements of the proposed options.

Table VIII–2 of this preamble presents the total annualized social costs of the four regulatory options, compared to baseline and calculated using three percent and seven percent discount rates. The proposed rule (Option 3) has estimated incremental social costs of $200 million using a three percent discount rate and $216 million using a seven percent discount rate.

TABLE VIII–2—ESTIMATED TOTAL ANNUALIZED SOCIAL COSTS

[Millions of 2021$, three and seven percent discount rate]

| Regulatory option | 3% Discount rate | 7% Discount rate |
|---|---|---|
| Option 1 .... | $88.4 | $96.6 |
| Option 2 .... | 167.0 | 180.4 |
| Option 3 .... | 200.3 | 216.5 |
| Option 4 .... | 207.2 | 224.1 |

*C. Economic Impacts*

EPA assessed the economic impacts of this proposed rule in two ways: (1) a screening-level assessment of the cost impacts on existing EGUs at steam electric plants and the entities that own those plants, based on comparison of costs to revenue and (2) an assessment of the impacts within the context of the broader electricity market, which includes an assessment of changes in predicted plant closures attributable to the proposed rule. The following sections summarize the results of these analyses. The RIA discusses the methods and results in greater detail.

The first set of cost and economic impact analyses—at both the plant and parent company level—provides screening-level indicators of the impacts of costs for FGD wastewater, BA transport water, and CRL controls relative to historical operating characteristics of steam electric plants incurring those costs (*i.e.,* level of electricity generation and revenue). EPA conducted these analyses for baseline and for the four regulatory options presented in Table VII–1 of this preamble, then compared these impacts to understand the incremental effects of the regulatory options in this proposal.

The second set of analyses looks at broader electricity market impacts, considering the interconnection of regional and national electricity markets. This analysis also looks at the distribution of impacts at the plant and EGU level. This second set of analyses provides insight on the impacts of the proposed rule on steam electric plants, as well as the entire electricity market, including changes in capacity, generation, and wholesale electricity prices. The market analysis compares model predictions for the proposed rule to a base case that includes the predicted and observed economic and market effects of the 2020 rule and other environmental regulations.

1. Screening-Level Assessment

EPA conducted a screening-level analysis of each regulatory option's potential impact on existing EGUs at steam electric plants and parent entities based on cost-to-revenue ratios. For each of the two levels of analysis (plant and parent entity), the Agency assumed, for analytic convenience and as a worst-case scenario, that none of the compliance costs would be passed on to consumers through electricity rate increases and would instead be absorbed by the steam electric plants and their parent entities. This assumption overstates the impacts of compliance expenditures since steam electric plants that operate in a regulated market may be able to pass on changes in production costs to consumers through changes in electricity prices. It is, however, an appropriate assumption for a screening-level estimate of the potential cost impacts.

a. Plant-Level Cost-to-Revenue Analysis

EPA developed revenue estimates for this analysis using EIA data. EPA then calculated the change in the annualized after-tax costs of the four regulatory options presented in Table VII–1 of this preamble as a percent of baseline annual revenues. See Chapter 4 of the RIA for a more detailed discussion of the methodology used for the plant-level cost-to-revenue analysis.

Cost-to-revenue ratios are screening-level indicators of potential economic impacts. EPA guidance describes certain cost-to-revenue ratios for evaluating small entity impacts under the RFA (U.S. EPA 2006).[131] As described in the Guidance, plants incurring costs below one percent of revenue are unlikely to face economic impacts, while plants with costs between one percent and three percent of revenue have a higher chance of facing economic impacts, and plants incurring costs above three percent of revenue have a still higher probability of economic impact.

Under the proposed rule (Option 3), EPA estimated that 19 plants would incur incremental costs greater than or equal to one percent of revenue,

[131] U.S. Environmental Protection Agency. (2006). Final Guidance for EPA Rulewriters: Regulatory Flexibility Act as Amended by the Small Business Regulatory Enforcement Fairness Act.



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including three plants that have costs greater than or equal to three percent of revenue, and an additional 73 plants would incur costs that are less than one percent of revenue. Section 4.2 in the RIA provides results for the other regulatory options EPA analyzed.

b. Parent Entity-Level Cost-to-Revenue Analysis

EPA also assessed the economic impact of the regulatory options presented in Table VII–1 of this preamble at the parent entity level. The screening-level cost-to-revenue analysis at the parent entity level provides insight on the impact on those entities that own existing EGUs at steam electric plants. In this analysis, the domestic parent entity associated with a given plant is defined as the entity with the largest ownership share in the plant. For each parent entity, EPA compared the incremental change in the total annualized after-tax costs and the total revenue for the entity to baseline (see Chapter 4 of the RIA for details). Following the methodology employed in the analyses for the 2015 and 2020 rules, EPA considered a range of estimates for the number of entities owning an existing EGU at a steam electric plant to account for partial information available for steam electric plants that are not expected to incur ELG compliance costs.

Like the plant-level analysis above, cost-to-revenue ratios provide screening-level indicators of potential economic impacts, this time to the owning entities; higher ratios suggest a higher probability of economic impacts. EPA estimated that the number of entities owning existing EGUs at steam electric plants ranges from 229 (lower-bound estimate) to 427 (upper-bound estimate), depending on the assumed ownership structure of plants not incurring ELG costs and not explicitly analyzed. EPA estimates that under the proposed rule (Option 3), four parent entities would incur annualized costs representing one percent or more of their revenues, including one parent entity that would incur costs representing more than three percent of revenue.

2. Electricity Market Impacts

To analyze the impacts of regulatory actions affecting the electric power sector, EPA commonly uses IPM, a comprehensive electricity market optimization model that can evaluate such impacts within the context of regional and national electricity markets. The model is designed to evaluate the effects of changes in EGU-level electric generation costs on the total cost of electricity supply, subject to specified demand and emissions constraints. Use of a comprehensive market analysis system is important in assessing the potential impact of any power plant regulation because of the interdependence of EGUs in supplying power to the electric transmission grid. Changes in electricity production costs at some EGUs can have a range of broader market impacts affecting other EGUs, including the average likelihood that various units are dispatched. The analysis also provides important insight on steam electric capacity closures (*e.g.,* retirements of EGUs that become uneconomical relative to other EGUs), based on a more detailed analysis of market factors than in the screening-level analyses above.

In contrast to the screening-level analyses, which are static analyses and do not account for interdependence of EGUs in supplying power to the electricity transmission grid, IPM accounts for potential changes in the generation profile of steam electric and other EGUs and consequent changes in market-level generation costs as the electric power market responds to changes in generation costs for steam electric EGUs due to the regulatory options. Additionally, in contrast to the screening-level analyses, in which EPA assumed no cost pass-through of ELG compliance costs, IPM depicts production activity in wholesale electricity markets where the specific increases in electricity prices for individual markets would result in some recovery of compliance costs for plants. IPM is based on an inventory of U.S. utility- and nonutility-owned EGUs and generators that provide power to the integrated electric transmission grid, including plants to which the ELGs apply.

EPA analyzed proposed Option 3 using IPM. The results of this analysis further inform EPA's understanding of the potential impacts of the proposed rule (Option 3). The version of IPM used for this analysis, IPM V6, embeds an energy demand forecast that is derived from DOE's ''Annual Energy Outlook 2021'' (AEO 2021). IPM also incorporates the expected compliance response into existing regulatory requirements for regulations affecting the power sector, including the 2020 ELG rule, CSAPR and CSAPR Update, MATS rule, the final 2014 CWA section 316(b) rule, and the final 2015 CCR rule and CCR Part A rule. The reference case also includes the effects of the Regional Greenhouse Gas Initiative; California's Global Warming Solutions Act; Renewable Portfolio Standards state-level policies, including recent Clean Energy Standards in Illinois, Oregon, Delaware, North Carolina, and Massachusetts; and the 45Q tax credit for $CO_2$ sequestration.

In analyzing the proposed option, EPA estimated incremental fixed and variable costs for the steam electric plants and EGUs to comply with Option 3. Because IPM is not designed to endogenously model the selection of wastewater treatment technologies as a function of electricity generation, effluent flows, and pollutant discharge, EPA estimated these costs exogenously for each steam EGU and input these costs into the IPM model as fixed and variable O&M cost adders in addition to the costs already reflected in the Base Case, which included compliance with the 2020 ELG rule (the baseline analysis). EPA then ran IPM with these new cost estimates to determine the dispatch of EGUs that would meet projected demand at the lowest costs, subject to the same constraints as those in the baseline analysis. The estimated changes in plant- and EGU-specific production levels and costs—and, in turn, changes in the electric power sector's total costs and production profile—are key data elements in evaluating the expected national and regional effects of the regulatory options in this proposal, including closures or avoided closures of EGUs and plants.

EPA considered impact metrics of interest at three levels of aggregation: (1) impact on national and regional electricity markets (all electric power generation, including steam and nonsteam electric plants); (2) impact on steam electric plants as a group, and (3) impact on individual steam electric plants incurring costs. Chapter 5 of the RIA discusses the first analysis; the sections below summarize the last two, which are further described in Chapter 5 of the RIA. All results presented below are representative of modeled market conditions in the model year 2030, when the plants will have implemented changes to meet the proposed ELGs.

a. Impacts on Existing Steam Electric Power Plants

EPA used IPM results for 2030 to assess the potential impact of the proposed rule on existing EGUs at steam electric plants. The purpose of this analysis is to assess any fleetwide changes from baseline impacts on EGUs at steam electric plants. Table VIII–3 of this preamble reports estimated results for existing EGUs at steam electric plants, as a group. EPA looked at the following metrics: (1) incremental early retirements and capacity closures, calculated as the difference between capacity under the regulatory option



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and capacity under baseline; (2) incremental capacity closures as a percentage of baseline capacity; (3) change in electricity generation from plants subject to the ELGs; (4) changes in variable production costs per MWh, calculated as the sum of total fuel and variable O&M costs divided by net generation; and (5) changes in annual costs (fuel, variable O&M, fixed O&M, and capital). Note that changes in electricity generation at steam electric plants presented in Table VIII–3 of this preamble are attributable both to changes in retirements and changes in capacity utilization at operating EGUs and plants.

TABLE VIII-3—ESTIMATED IMPACT OF THE PROPOSED RULE (OPTION 3) ON STEAM ELECTRIC PLANTS AS A GROUP AT THE YEAR 2030

| Metric | Baseline value | Change attributable to the proposed rule as compared to baseline | |
|---|---|---|---|
| | | Value | Percent |
| Total capacity (MW) | 274,256 | −249 | −0.1 |
| Early retirement or closure (MW) | 56,422 | 249 | 0.4 |
| Early retirement or closure (number of plants) | 28 | 1 | 3.6 |
| Total generation (GWh) | 1,226,067 | −5,703 | −0.5 |
| Average variable production cost (2021$/MWh) | $21.63 | $0.02 | 0.1 |
| Annual cost (million 2021$) | $44,427 | $2 | 0.0 |

MW = megawatt; MWh = megawatt-hour; GWh = gigawatt-hour = 1,000 MWh.

Under the proposed rule, generation at steam electric plants is projected to decrease by 5,703 GWh (0.5 percent) nationally when compared to baseline. IPM projects a net decline in total steam electric capacity by 249 MW (approximately 0.1 percent of total baseline capacity) due to early retirement attributable to this proposal. One additional plant is projected to retire early under the proposed rule when compared to baseline. See section 5.2.2.2 in the RIA for details.

These findings suggest that the proposed rule can be expected to have small economic consequences for steam electric plants as a group. Option 3 would affect the operating status of very few steam electric plants, with only one additional plant closure (a plant with very low capacity utilization of less than six percent in baseline).

b. Impacts on Individual Plants Incurring Costs

To assess potential plant-level effects, EPA also analyzed plant-specific changes attributable to the proposed rule for the following metrics: (1) capacity utilization (defined as annual generation (in MWh) divided by [capacity (MW) times 8,760 hours]), (2) electricity generation, and (3) variable production costs per MWh, defined as variable O&M cost plus fuel cost divided by net generation. The analysis of changes in individual plants is detailed in Chapter 5 of the RIA. The results indicate that most plants would experience only slight effects—*i.e.,* no change or less than a one percent reduction or one percent increase. Across the full set of steam electric plants modeled, 30 plants would incur a reduction in generation of at least one percent; 18 of these plants are also estimated to incur a reduction in capacity utilization of at least one percent. Of the subset of 46 steam electric plants that would incur costs under Option 3, 19 plants incur a decrease in generation, whereas 16 plants see no change, 10 plants close in baseline, and one additional plant closes under Option 3.

## IX. Pollutant Loadings

In developing ELGs, EPA typically evaluates the pollutant loading reductions of regulatory options to assess the impacts of the compliance requirements on discharges from the whole industry. EPA took the same approach to the one described above for plant-specific costs for estimating pollutant reductions associated with this proposal. That is, EPA compared the values to a baseline that reflects implementation of existing environmental regulations, including the 2020 rule for FGD wastewater and BA transport water.

The general methodology that EPA used to calculate pollutant loadings is the same as that described in the 2020 rule. EPA first estimated—on an annual, per plant basis—the pollutant discharge load associated with the technology bases evaluated for plants to comply with the 2020 rule requirements for FGD wastewater and BA transport water, accounting for the current or planned conditions at each plant. For CRL, EPA estimated the pollutant discharge load associated with current discharges. For all wastestreams, EPA similarly estimated plant-specific post-compliance pollutant loadings as the load associated with the technology bases for plants to comply with effluent limitations based on each regulatory option in this proposal. For each regulatory option, EPA then calculated the changes in pollutant loadings at a particular plant as the sum of the differences between the estimated baseline and post-compliance discharge loads for each applicable wastestream.

For plants that discharge indirectly to POTWs, EPA adjusted the baseline and option loads to account for pollutant removals expected from POTWs. These adjusted pollutant loadings for indirect dischargers therefore reflect the resulting discharges to receiving waters. For additional details on the methodology EPA used to calculate pollutant loading reductions, see section 6 of the TDD.

### *A. FGD Wastewater*

For FGD wastewater, EPA continued to use the average pollutant effluent concentration with plant-specific discharge flow rates to estimate the mass pollutant discharge per plant for baseline and each proposed regulatory option in Table VII–1 of this preamble. EPA used data compiled for the 2015 and 2020 rules as the initial basis for estimating discharge flow rates and updated the data to reflect retirements or other relevant changes in operation. As in the 2020 rule, EPA also accounted for increased rates of recycle through the scrubber that would affect the discharge flow.

EPA assigned pollutant concentrations for each analyte based on the operation of a treatment system designed to comply with baseline or the regulatory options. EPA used data compiled for the 2020 rule to characterize FGD chemical precipitation plus LRTR effluent and chemical



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precipitation plus membrane filtration effluent. In addition, EPA used data provided by industry and other stakeholders during the 2020 rule, as described in Section IV of this preamble, to quantify bromide in FGD wastewater under baseline conditions and for the four regulatory options.

*B. BA Transport Water*

EPA estimated baseline and post-compliance loadings for each regulatory option in Table VII–1 of this preamble using pollutant concentrations for BA transport water and plant-specific flow rates. EPA used data compiled for the 2020 rule as the basis for estimating BA transport water discharge flows and updated the data set to reflect retirements and other relevant changes in operation (*e.g.,* ash handling conversions, fuel conversions) that have occurred since collecting the 2020 rule data. Under the baseline, which reflects the 2020 rule requirement for the high recycle rate technology option (or BMP plan in the case of Merrimack Station), EPA estimated discharge flows associated with the purge from remote MDS operation, based on the generating unit capacity and the volume of the remote MDS. Under the zero discharge option, EPA estimated a flow rate of zero.

*C. CRL*

For CRL, EPA used the average pollutant effluent concentration with plant-specific discharge flow rates to estimate the mass pollutant discharge per plant for baseline and chemical precipitation (proposed in each regulatory option) in Table VII–1 of this preamble. EPA used data compiled for the 2015 rule as the initial basis for estimating discharge flow rates and updated the data to reflect retirements. EPA also used utilities' ''CCR Rule Compliance Data and Information'' websites to identify new landfills constructed since 2015. For new landfills, EPA used the 2015 methodology to estimate leachate flow proportionate to landfill size, if available, or as the median leachate volume (in gallons per day (GPD)) calculated from the 2010 steam electric survey.

EPA assigned pollutant concentrations for each analyte based on current operating conditions or treatment in place for baseline and the operation of a treatment system designed to comply with the four regulatory options. EPA used data compiled for the 2015 rule to characterize untreated CRL and, as in the 2015 rule, transferred the average FGD effluent concentrations for chemical precipitation.

*D. Legacy Wastewater*

EPA is not proposing nationally applicable BAT limitations or PSES for legacy wastewater and, therefore, did not estimate changes in loadings under the regulatory options. EPA has nevertheless evaluated the scope of pond dewatering and decant wastewaters and associated baseline pollutant discharges in *Legacy Wastewater at CCR Surface Impoundments* (SE10252). As discussed in Section VII.B.4 of this preamble, EPA is soliciting comment on various technologies that could potentially serve as a technology basis for BAT for these two specific legacy wastewaters. EPA has evaluated the potential costs and pollutant removals of these technologies as part of its *Legacy Wastewater at CCR Surface Impoundments* (SE10252).

*E. Summary of Incremental Changes of Pollutant Loadings From Four Regulatory Options*

Table IX–1 of this preamble summarizes the net reduction to annual pollutant loadings, compared to baseline, associated with each regulatory option in Table VII–1 of this preamble. Compared to the 2020 rule (baseline), all regulatory options result in decreased pollutant loadings to surface waters.

TABLE IX–1—ESTIMATED INCREMENTAL REDUCTIONS IN ANNUAL POLLUTANT LOADING FOR REGULATORY OPTIONS 1, 2, 3, AND 4 [IN POUNDS/YEAR] COMPARED TO BASELINE

| Regulatory option | Reductions in annual pollutant loadings |
|---|---|
| 1 | 18,100,000 |
| 2 | 575,000,000 |
| 3 | 584,000,000 |
| 4 | 639,000,000 |

Note: Reductions in pollutant loadings are rounded to three significant figures.

**X. Non-Water Quality Environmental Impacts**

The elimination or reduction of one form of pollution may create or aggravate other environmental problems. Therefore, sections 304(b) and 306 of the CWA require EPA to consider non-water quality environmental impacts (including energy requirements) associated with ELGs. Accordingly, EPA has considered the potential impact of the regulatory options in this proposal on air emissions, solid waste generation, and energy consumption. In general, EPA used the same methodology (with updated data as applicable) as it did for the analyses supporting the 2015 and 2020 rules to conduct this analysis. The following sections summarize the methodology and results. See section 7 of the supplemental TDD for additional details.

*A. Energy Requirements*

Steam electric power plants use energy when transporting ash and other solids on or off site, operating wastewater treatment systems (*e.g.,* chemical precipitation, membrane filtration), or operating ash handling systems. For this proposal, EPA considered whether there would be an associated change in the incremental energy requirements compared to baseline. Energy requirements vary depending on the regulatory option evaluated and the current operations of the facility. Therefore, as applicable, EPA estimated the increase in energy usage in megawatt hours (MWh) for equipment added to the plant systems or in consumed fuel (gallons) for transportation/operating equipment for all four regulatory options. EPA summed the facility-specific estimates to calculate the net change in energy requirements from baseline for the regulatory options.

EPA estimated the amount of energy needed to operate wastewater treatment systems and ash handling systems based on the horsepower rating of the pumps and other equipment. EPA also estimated any changes in the fuel consumption associated with transporting solid waste and combustion residuals (*e.g.,* ash) from steam electric power plants to landfills (on- or off-site). The frequency and distance of transport depends on a plant's operation and configuration; specifically, the volume of waste generated and the availability of either an on-site or off-site nonhazardous landfill and its distance from the plant. Table X–1 of this preamble shows the net change in annual electrical energy usage associated with the regulatory options compared to baseline, as well as the net change in annual fuel consumption requirements associated with the four regulatory options compared to baseline.



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TABLE X–1—ESTIMATED INCREMENTAL CHANGE IN ENERGY REQUIREMENTS ASSOCIATED WITH REGULATORY OPTIONS COMPARED TO BASELINE

| Non-water quality environmental impact | Energy use associated with regulatory options | | | |
|---|---|---|---|---|
| | Option 1 | Option 2 | Option 3 | Option 4 |
| Electrical energy usage (MWh) | 38,000 | 126,000 | 139,000 | 151,000 |
| Fuel (thousand gallons) | 53.0 | 122 | 622 | 639 |

*B. Air Pollution*

The four proposed regulatory options are expected to affect air pollution through three main mechanisms: (1) changes in auxiliary electricity use by steam electric plants to operate wastewater treatment, ash handling, and other systems needed to comply with regulatory requirements; (2) changes to transportation-related emissions due to the trucking of CCR waste to landfills; and (3) the change in the profile of electricity generation due to regulatory requirements. This section discusses air emission changes associated with the first two mechanisms and presents the corresponding estimated net changes in air emissions. See Section XII.B.3 of this preamble for additional discussion of the third mechanism.

Steam electric power plants generate air emissions from operating transport vehicles, such as dump trucks, which release criteria air pollutants and GHGs. Similarly, a decrease in energy use or vehicle operation would result in decreased air pollution.

To estimate the net air emissions associated with changes in electrical energy use projected as a result of the regulatory options in this proposal compared to baseline, EPA combined the energy usage estimates with air emission factors associated with electricity production to calculate air emissions associated with the incremental energy requirements. EPA estimated $NO_X$, $SO_2$, and $CO_2$ emissions using plant- or North American Electric Reliability Corporation (NERC)-specific emission factors (ton/MWh) obtained from IPM for run year 2035.[132]

To estimate net air emissions associated with the change in operation of transport vehicles, EPA used the MOVES2021b model to identify air emission factors (gram per mile) for the air pollutants of interest. EPA estimated the annual number of miles that dump trucks moving ash or wastewater treatment solids to on- or off-site landfills would travel for the regulatory options. EPA used these estimates to calculate the net change in air emissions for the four regulatory options. Table X–2 of this preamble presents EPA's estimated net change in air emissions associated with auxiliary electricity and transportation for the proposed options.

TABLE X–2—ESTIMATED NET CHANGE IN INDUSTRY-LEVEL AIR EMISSIONS ASSOCIATED WITH AUXILIARY ELECTRICITY AND TRANSPORTATION FOR OPTIONS COMPARED TO BASELINE

| Non-water quality environmental impact | Option 1 | Option 2 | Option 3 | Option 4 |
|---|---|---|---|---|
| $CO_2$ (million tons/year) | 0.03 | 0.12 | 0.13 | 0.14 |
| $NO_X$ (thousand tons/year) | 0.02 | 0.065 | 0.081 | 0.085 |
| $SO_2$ (thousand tons/year) | 0.022 | 0.06 | 0.07 | 0.072 |

The modeled output from IPM predicts changes in electricity generation due to compliance costs attributable to the proposed options compared to baseline. These changes in electricity generation are, in turn, predicted to affect the amount of $NO_X$, $SO_2$, and $CO_2$ emissions from steam electric power plants.[133] A summary of the net change in annual air emissions associated with Option 3 for all three mechanisms are shown in Table X–3 of this preamble. As with costs, the IPM run from this option reflects the range of non-water quality environmental impacts associated with all four regulatory options. To provide some perspective on the estimated changes, EPA compared the estimated change in air emissions to the net amount of air emissions generated in a year by all electric power plants throughout the United States. For a detailed breakout of each of the three sources of air emission changes, see section 7 of the TDD.

[132] While EPA only ran IPM for the proposed rule (Option 3), EPA extrapolated the benefits estimated using these IPM outputs to options 1, 2, and 4 to provide insight on the potential air quality-related effects of the other regulatory options. See Section 8 of the BCA for details.

[133] EPA also considered changes in particulate matter (see Section XII.B.3 of this preamble). As explained in the BCA Chapter 8.1: ''IPM outputs include estimated CO2, $NO_X$, and $SO_2$ emissions to air from EGUs. EPA also used IPM outputs to estimate EGU emissions of primary $PM_{2.5}$ based on emission factors described in U.S. EPA (2020c). Specifically, EPA estimated primary $PM_{2.5}$ emissions by multiplying the generation predicted for each IPM plant type (ultrasupercritical coal without carbon capture and storage, combined cycle, combustion turbine, etc.) by a type-specific empirical emission factor derived from the 2016 National Emissions Inventory (NEI) and other data sources. The emission factors reflect the fuel type (including coal rank), FGD controls, and state emission limits for each plant type, where applicable.''



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TABLE X–3—ESTIMATED NET CHANGE IN INDUSTRY-LEVEL AIR EMISSIONS ASSOCIATED WITH CHANGES IN AUXILIARY ELECTRICITY, TRANSPORTATION, AND ELECTRICITY GENERATION FOR PROPOSED OPTION 3 COMPARED TO BASELINE

| Non-Water quality environmental impact | Change in emissions—option 3 | 2020 emissions by electric power generating industry |
|---|---|---|
| $CO_2$ (million tons/year) | −11 | 1,650 |
| $NO_X$ (thousand tons/year) | −5.1 | 1,020 |
| $SO_2$ (thousand tons/year) | −5.8 | 954 |

*C. Solid Waste Generation and Beneficial Use*

Steam electric power plants generate solid waste associated with sludge from wastewater treatment systems (*e.g.,* chemical precipitation). EPA estimated the change in the amount of solids generated under each regulatory option for each plant compared to baseline. Table X–4 of this preamble shows the net change in annual solid waste generation, compared to baseline, associated with the four regulatory options.

TABLE X–4—ESTIMATED INCREMENTAL CHANGES TO SOLID WASTE GENERATION ASSOCIATED WITH REGULATORY OPTIONS COMPARED TO BASELINE

| Non-Water quality environmental impact | Solid waste generation associated with regulatory options | | | |
|---|---|---|---|---|
| | Option 1 | Option 2 | Option 3 | Option 4 |
| Solids generated (tons/year) | 236,000 | 1,220,000 | 1,240,000 | 1,330,000 |

EPA also evaluated the potential impacts of diverting FA from current beneficial uses toward encapsulation of membrane filtration brine for disposal in a landfill. According to the latest American Coal Ash Association survey,[134] more than half of the FA generated by coal-fired power plants is being sold for beneficial uses rather than disposed, and the majority of this beneficially used FA is replacing Portland cement in concrete. This also holds true for the specific facilities currently discharging FGD wastewater and expected to install membranes under proposed Option 3, as seen by sales of FA in the 2020 EIA–923 Schedule 8A.[135] Summary statistics of the FA beneficial use percentage for these facilities is displayed in Table X–5 below.

TABLE X–5—PERCENT OF FA SOLD FOR BENEFICIAL USE AT FACILITIES DISCHARGING FGD WASTEWATER

| Statistic | FA percent sold for beneficial use (percent) |
|---|---|
| Min | 0 |
| 10th | 0 |
| 25th | <1 |

TABLE X–5—PERCENT OF FA SOLD FOR BENEFICIAL USE AT FACILITIES DISCHARGING FGD WASTEWATER—Continued

| Statistic | FA percent sold for beneficial use (percent) |
|---|---|
| Median | 39 |
| Mean | 46 |
| 75th | 86 |
| 90th | 99 |
| Max | 100 |

In the CCR rule,[136] EPA noted that FA replacing Portland cement in concrete would result in significant avoided environmental impacts to energy use, water use, GHG emissions, air emissions, and waterborne wastes.

Based on EPA's analysis of 2019 and 2020 EIA data, most of the power plants that would be expected to install membrane filtration under proposed Option 3 have enough FA for encapsulation before accounting for reported FA sales, leaving only two plants without enough FA needed for the estimated encapsulation recipe (by approximately 240,000 tons of FA). After accounting for reported FA sales, EPA estimates that six power plants may not have enough FA available for encapsulation (by approximately 750,000 tons of FA). These facilities would thus have to reduce sales of their FA, use additional lime, find a beneficial use of the brine, dispose of the brine through deep well injection, or reduce the volume of brine with thermal technologies including potential crystallization. EPA expects that the amount of FA required for encapsulation will vary based on the amount of FGD wastewater generated and treated in a given operating year, in addition to the variability in FA markets. Based on the 2020 EIA data, coal-fired power plants reported more than 30 million tons of FA sold, and while there are increasing FA sales reported, EPA identified more than 100 coal-fired power plants (9.6 million tons of FA) that do not report any FA sales. EPA estimates that there is enough FA to accommodate both FGD brine encapsulation needs and the beneficial use market and proposes to find that this non-water quality environmental impact is acceptable. See also discussion in Section VII.B.1.a of this preamble.

*D. Changes in Water Use*

Steam electric power plants generally use water for handling solid waste, including ash, and for operating wet FGD scrubbers. The technology basis for FGD wastewater in the 2020 rule, chemical precipitation plus LRTR, was not expected to reduce or increase the volume of water used. Under this proposed rule, plants that install a

[134] Available online at: *www.acaa-usa.org/wp-content/uploads/coal-combustion-products-use/2016-Survey-Results.pdf.*

[135] Available online at: *www.eia.gov/electricity/data/eia923/.*

[136] Available online at: *www.regulations.gov.* Docket ID: EPA–HQ–RCRA–2009–0640.



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membrane filtration system for FGD wastewater treatment are assumed to decrease their water use compared to baseline by recycling all permeate back into the FGD system, which would avoid the costs of pumping or treating new makeup water. Therefore, EPA estimated the reduction in water use resulting from membrane filtration treatment as equal to the estimated volume of the permeate stream from the membrane filtration system.

The BA transport technologies associated with the baseline and the proposed rule for BA transport water eliminate or reduce the volume of water used by wet sluicing BA operating systems. The 2020 rule established limitations based on plants operating a high recycle rate system, allowing up to a 10 percent purge of the total system volume. As part of this rule, EPA is proposing options that include zero-discharge requirements for BA handling, which may result in a decrease in water use for BA handling by eliminating the purge. For proposed Options 1 and 2, EPA generally expects no change in water use associated with BA handling. For proposed Options 3 and 4, EPA expects to see a decrease in water use for BA handling operations. Under this proposed rule, plants that operate zero discharge BA handling systems are assumed to decrease their water use compared to baseline by recycling all transport water back to the BA handling system, which would avoid the costs of pumping or treating new makeup water. Therefore, EPA estimated the reduction in water use resulting from complete recycle as equal to the estimated volume of the 10 percent purge.

EPA does not estimate a change in water use associated with the treatment technology considered for the treatment of CRL as part of this proposed rule.

Overall, EPA estimates that plants impacted by the proposed rule would decrease their water use by 11.8 MGD compared to baseline for preferred regulatory Option 3. Table X–6 of this preamble sums the changes for FGD wastewater and BA transport water and shows the net decrease in water use, compared to baseline, for the four regulatory options.

TABLE X–6—ESTIMATED INCREMENTAL DECREASES IN WATER USE ASSOCIATED WITH REGULATORY OPTIONS COMPARED TO BASELINE

| Non-Water quality environmental impact | Decreases in water use associated with regulatory options | | | |
|---|---|---|---|---|
| | Option 1 | Option 2 | Option 3 | Option 4 |
| Decreases in water use (MGD) | 4.47 | 9.79 | 11.8 | 12.4 |

## XI. Environmental Assessment

### *A. Introduction*

EPA conducted an environmental assessment for this proposed rule. The Agency reviewed available literature on the documented environmental and human health effects of the pollutants discharged in steam electric power plant FGD wastewater, BA transport water, CRL, and legacy wastewater. EPA conducted modeling to determine the impacts of pollutant discharges from the plants to which the proposed rule applies. For the reasons described in Section VIII of this preamble of this preamble, the baseline for these analyses appropriately consists of the environmental and human health results of achieving the 2020 rule requirements (the same baseline EPA used to evaluate costs, benefits, and pollutant loads). Under this assessment, EPA compared the change in impacts associated with the four regulatory options presented in Table VII–1 of this preamble to those projected under baseline.

Information from EPA's review of the scientific literature and documented cases of impacts of pollutants discharged in steam electric power plant wastewater on human health and the environment, as well as a description of EPA's modeling methodology and results, are provided in the Environmental Assessment for Proposed Supplemental ELGs (EA Report). The EA Report contains information on literature that EPA has reviewed since the 2020 rule, updates to the environmental assessment analyses, and modeling results for each of the regulatory options in this proposal. The 2015 EA (EPA–821–R–15–006) and 2020 EA (EPA 821–R–20–002) provide information from EPA's earlier review of the scientific literature and documented cases of the impacts associated with the wider range of steam electric power plant wastewater discharges addressed in the 2015 rule on human health and the environment, as well as a full description of EPA's modeling methodology.

Current scientific literature indicates that untreated steam electric power plant wastewaters, such as FGD wastewater, BA transport water, CRL, and legacy wastewater, contain large amounts of a wide range of pollutants, some of which are toxic and bioaccumulative and cause detrimental environmental and human health impacts. For additional information, see section 2 of the EA Report. EPA also considered environmental and human health effects associated with changes in air emissions, solid waste generation, and water withdrawals. Sections X and XII of this preamble discuss these effects.

### *B. Updates to the Environmental Assessment Methodology*

The environmental assessment modeling for this proposed rule consisted of the steady-state, national-scale immediate receiving water (IRW) model that EPA used to evaluate the direct and indirect discharges from steam electric power plants for the 2020 ELG rule, 2015 ELG rule, and 2015 CCR rule. The model focused on impacts within the immediate surface waters where discharges occurred (the closest segments of approximately 0.25 miles to five miles long). EPA also modeled receiving water concentrations downstream from steam electric power plant discharges using a downstream fate and transport model (*see* Section XII of this preamble). For this proposed rule, the Agency expanded its environmental assessment to evaluate cumulative impacts by assessing human health impacts from the joint toxic action of multiple pollutants in steam electric power plant discharges. The environmental assessment also incorporates changes to the industry profile outlined in Section V of this preamble.

### *C. Outputs From the Environmental Assessment*

Compared to baseline, EPA estimated environmental and ecological changes associated with changes in pollutant loadings for the four regulatory options presented in Table VII–1 of this preamble. These include changes in impacts to wildlife and humans. More specifically, in addition to other unquantified environmental changes (*e.g.,* groundwater quality and attractive nuisances), the environmental



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assessment evaluated changes in: (1) surface water quality, (2) impacts to wildlife, (3) number of receiving waters with potential human health cancer risks, (4) number of receiving waters with potential to cause noncancer human health effects, (5) metal and nutrient discharges to sensitive waters (*e.g.,* CWA Section 303(d) impaired waters impaired waters), and (6) number of receiving waters with potential joint toxic action of multiple pollutants. EPA also evaluates further impacts in Section XII of this preamble.

As described in the EA Report, EPA focused its quantitative analyses on the changes in environmental and human health impacts associated with exposure to toxic bioaccumulative pollutants via the surface water pathway. EPA modeled changes in discharged toxic, bioaccumulative pollutants from FGD wastewater, BA transport water, and CRL into rivers, streams, and lakes, including reservoirs. EPA also addressed environmental impacts from nutrients in the EA Report, as well as in a separate analysis in Section XII of this preamble.

The environmental assessment concentrates on impacts to aquatic life based on changes in surface water quality; impacts to aquatic life based on changes in sediment quality in surface waters; impacts to wildlife from consumption of contaminated aquatic organisms; and impacts to human health from consumption of contaminated fish and water. The EA Report discusses, with quantified results, the estimated environmental improvements projected within the immediate receiving waters due to the estimated pollutant loading reductions associated with the regulatory options in this proposal compared to the 2020 rule.

## XII. Benefits Analysis

This section summarizes EPA's estimates of the changes in national environmental benefits expected to result from changes in steam electric plant discharges described in Section IX of this preamble, and the resultant environmental effects, summarized in Section XI of this preamble. The Benefit Cost Analysis (BCA) report provides additional details on the benefits methodologies and analyses. The analysis methodology for quantified benefits is generally the same that EPA used for the 2015 and 2020 rules, but with revised inputs and assumptions that reflect updated data and regulatory options.

### *A. Categories of Benefits Analyzed*

Table XII–1 of this preamble summarizes benefit categories associated with the four regulatory options and notes which categories EPA was able to quantify and monetize. Analyzed benefits fall into four broad categories: (1) human health benefits from surface water quality improvements, (2) ecological conditions and effects on recreational use from surface water quality changes, (3) market and productivity benefits, and (4) air-related effects.[137] Within these broad categories, EPA was able to assess the benefits associated with the regulatory options in this proposal with varying degrees of completeness and rigor. Where possible, EPA quantified the expected changes in effects and estimated monetary values. However, data limitations, modeling limitations, and gaps in the understanding of how society values certain environmental changes prevent EPA from quantifying and/or monetizing some benefit categories. EPA notes that all human health and environmental improvements discussed in the EA Report also represent benefits of the proposal (whether quantified or unquantified), and the Agency will continue to enhance its benefits analysis methods where appropriate as it finalizes the rule.

The following section summarizes EPA's analysis of the benefit categories the Agency was able to partially quantify and/or monetize to various degrees (identified in the columns of Table XII–1 of this preamble, respectively). EPA solicits comment on the extent to which unquantified benefits (*e.g.,* some health endpoints without defined dose-response relationship) or partially quantified benefits (*e.g.,* the social cost of GHG metrics which omit many significant categories of climate damages) could be more fully quantified and/or monetized for any final rule. The regulatory options would also affect additional benefit categories that the Agency was not able to quantify or monetize at all. The BCA Report further describes some of these important nonmonetized benefits, and the Agency solicits comment on the extent to which these benefits could be quantified and/or monetized for any final rule.

TABLE XII–1—SUMMARY OF ESTIMATED BENEFITS CATEGORIES

| Benefit category | Quantified and monetized | Quantified, but not monetized | Neither quantified nor monetized |
|---|---|---|---|
| **Human Health Benefits From Surface Water Quality Improvements** | | | |
| Changes in incidence of bladder cancer from exposure to total trihalomethanes (TTHM) in drinking water | ☐ | | |
| Changes in incidence of cancer from arsenic exposure via consumption of self-caught fish | | ☐ | |
| Changes in incidence of cardiovascular disease from lead exposure via consumption of self-caught fish | | | ☐ |
| Changes in incidence of other cancer and noncancer adverse health effects (*e.g.,* reproductive, immunological, neurological, circulatory, or respiratory toxicity) due to exposure to arsenic, lead, cadmium, and other toxics from consumption of self-caught fish or drinking water | | ☐ | ☐ |
| Changes in IQ loss in children from lead exposure via consumption of self-caught fish | ☐ | | |
| Changes in specialized education needs for children from lead exposure via fish consumption of self-caught fish | | ☐ | |
| Changes in *in utero* mercury exposure via maternal fish consumption of self-caught fish | ☐ | | |

[137] Consistent with Office of Management and Budget Circular A–4, EPA appropriately considers ancillary benefits of this proposal (*e.g.,* air benefits). Circular A–4 states: *Your analysis should look beyond the direct benefits and direct costs of your rulemaking and consider any important ancillary benefits and countervailing risks. An ancillary benefit is a favorable impact of the rule that is typically unrelated or secondary to the statutory purpose of the rulemaking . . .*



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TABLE XII–1—SUMMARY OF ESTIMATED BENEFITS CATEGORIES—Continued

| Benefit category | Quantified and monetized | Quantified, but not monetized | Neither quantified nor monetized |
|---|---|---|---|
| Changes in health hazards from exposure to pollutants in waters used recreationally (*e.g.,* swimming) | | | ☐ |
| **Ecological Condition and Recreational Use Effects From Surface Water Quality Changes** | | | |
| Benefits from changes in surface water quality, including: aquatic and wildlife habitat; water-based recreation, including fishing, swimming, boating, and near-water activities; aesthetic benefits, such as enhancement of adjoining site amenities (*e.g.,* residing, working, traveling, and owning property near the water); [a] and nonuse value (existence, option, and bequest value from improved ecosystem health) [a] | ☐ | | |
| Benefits from protection of threatened and endangered species | | ☐ | |
| Changes in sediment contamination | | | ☐ |
| **Market and Productivity Benefits** | | | |
| Changes in water treatment costs for municipal drinking water, irrigation water, and industrial process | | | ☐ |
| Changes in commercial fisheries yields | | | ☐ |
| Changes in tourism and participation in water-based recreation. | | | ☐ |
| Changes in property values from water quality changes | | | ☐ |
| Changes in maintenance dredging of navigational waterways and reservoirs due to changes in sediment discharges | ☐ | | |
| **Air-Related Effects** | | | |
| Human health benefits from changes in morbidity and mortality from exposure to $NO_X$, $SO_2$, and particulate matter ($PM_{2.5}$) | ☐ | | |
| Avoided climate change impacts from $CO_2$ emissions | ☐ | | |

[a] Some, although not necessarily all, of these values are implicit in the total willingness to pay (WTP) for water quality improvements.

*B. Quantification and Monetization of Benefits*

1. Human Health Effects From Surface Water Quality Changes

Changes in pollutant discharges from steam electric plants affect human health in multiple ways. Exposure to pollutants in steam electric power plant discharges via consumption of fish from affected waters can cause a wide variety of adverse health effects, including cancer, kidney damage, nervous system damage, fatigue, irritability, liver damage, circulatory damage, vomiting, diarrhea, brain damage, and IQ loss. Exposure to drinking water containing brominated disinfection byproducts can cause adverse health effects such as cancer and reproductive and fetal development issues. Because the regulatory options in this proposal would change discharges of steam electric pollutants into waterbodies that directly receive or are downstream from these discharges, they may alter incidence of associated illnesses, even if by relatively small amounts.

Due to data limitations and uncertainties, EPA can only monetize a subset of the health benefits associated with changes in pollutant discharges from steam electric plants resulting from the regulatory options in this proposal as compared to baseline. EPA estimated the change in the number of individuals experiencing adverse human health effects in the populations exposed to steam electric discharges and/or altered exposure levels and valued these changes using different monetization methods for different benefit endpoints.

EPA estimated changes in health risks from the consumption of contaminated fish from waterbodies within 50 miles of households. EPA used Census block population data and region-specific average fishing rates to estimate the exposed population. EPA used cohort-specific fish consumption rates and waterbody-specific fish tissue concentration estimates to calculate potential exposure to steam electric pollutants in recreational fishers' households. Cohorts were defined by age, sex, race/ethnicity, and fishing mode (recreational or subsistence). EPA used these data to quantify and monetize changes in two categories of human health effects, which are further detailed in the BCA Report: (1) changes in IQ loss in children aged zero to seven from lead exposure via fish consumption and (2) changes in *in utero* mercury exposure via maternal fish consumption and associated IQ loss. EPA also analyzed the changes in the incidence of skin cancer from arsenic exposure via fish consumption but found negligible changes and therefore did not monetize the associated benefits.

Table XII–2 of this preamble summarizes the monetary value of changes in estimated health outcomes associated with consumption of contaminated fish for the ELG options compared to baseline. EPA estimated the annualized benefits of the proposed rule at $3.1 million using a three percent discount rate ($0.6 million using a seven percent discount rate). Chapter 5 of the BCA provides additional detail on the methodology. EPA solicits comment on the assumptions and uncertainties included in this analysis.



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TABLE XII–2—ANNUALIZED ESTIMATED BENEFITS OF CHANGES IN HUMAN HEALTH OUTCOMES ASSOCIATED WITH FISH CONSUMPTION (MILLIONS OF 2021$) FOR PROPOSED ELG OPTIONS COMPARED TO BASELINE

| Discount rate | Regulatory option | Reduced lead exposure for children | Reduced mercury exposure for children | Total |
|---|---|---|---|---|
| 3% | Option 1 | $0.00 | $2.94 | $2.94 |
| | Option 2 | 0.00 | 2.99 | 2.99 |
| | Option 3 | 0.00 | 3.11 | 3.11 |
| | Option 4 | 0.01 | 3.11 | 3.12 |
| 7% | Option 1 | 0.00 | 0.54 | 0.54 |
| | Option 2 | 0.00 | 0.55 | 0.55 |
| | Option 3 | 0.00 | 0.58 | 0.58 |
| | Option 4 | 0.00 | 0.58 | 0.58 |

EPA also estimated changes in bladder cancer incidence from the use and consumption of drinking water with changing levels of total trihalomethanes (TTHMs) resulting from reductions in bromide loadings associated with the four regulatory options relative to baseline. EPA estimated changes in cancer risks within populations served by drinking water treatment plants with intakes on surface waters affected by bromide discharges from steam electric plants. EPA used Safe Drinking Water Information System and U.S. Census data to estimate and characterize the exposed population. EPA modeled changes in waterbody-specific bromide concentrations and changes in drinking water treatment facility-specific TTHM concentrations to calculate potential changes in TTHM exposure and associated adverse health outcomes.

Table XII–3 of this preamble summarizes the estimated monetary value of estimated changes in bromide-related human health outcomes from modeled surface water quality improvements under the four regulatory options. The proposed rule (Option 3) is estimated to result in 112 avoided cancer cases and to have associated annualized benefits of $9.6 million using a three percent discount rate ($6.2 million using a seven percent discount rate).

TABLE XII–3—ESTIMATED ANNUALIZED HUMAN HEALTH BENEFITS OF CHANGING BROMIDE DISCHARGES (MILLIONS OF 2021$) UNDER THE PROPOSED ELG OPTIONS COMPARED TO BASELINE

| Discount rate | Regulatory option | Benefits from avoided mortality | Benefits from avoided morbidity | Total benefits |
|---|---|---|---|---|
| 3% | Option 1 | $0.45 | $0.00 | $0.45 |
| | Option 2 | 9.29 | 0.08 | 9.37 |
| | Option 3 | 9.53 | 0.08 | 9.61 |
| | Option 4 | 12.60 | 0.10 | 12.70 |
| 7% | Option 1 | 0.13 | 0.00 | 0.28 |
| | Option 2 | 6.04 | 0.05 | 6.09 |
| | Option 3 | 6.19 | 0.05 | 6.24 |
| | Option 4 | 8.19 | 0.07 | 8.26 |

The formation of TTHM in a particular water treatment system is a function of several site-specific factors, including chlorine, bromine, organic carbon, temperature, pH, and the system residence time. EPA did not collect site-specific information on these factors at each potentially affected drinking water treatment facility. Instead, EPA's analysis only addresses the estimated site-specific changes in bromides. EPA used the national relationship between changes in TTHM exposure and changes in incidence of bladder cancer modeled by Regli et al. (2015) [138] and Weisman et al. (2022).[139] Thus, while the national changes in TTHM and bladder cancer incidence given estimated changes in bromide are EPA's best estimate, EPA cautions that estimates for any specific drinking water treatment facility could be over- or underestimated. Additional details on this analysis are provided in Chapter 4 of the BCA Report. EPA solicits comment on all aspects of the approach to assessing bladder cancer risk as well as the uncertainty surrounding site-specific estimated benefits, as well as data that would help EPA evaluate this uncertainty.

[138] Regli, S., Chen, J., Messner, M., Elovitz, M.S., Letkiewicz, F.J., Pegram, R.A., . . . Wright, J.M. (2015). Estimating Potential Increased Bladder Cancer Risk Due to Increased Bromide Concentrations in Sources of Disinfected Drinking Waters. Environmental Science & Technology, 49(22), 13094–13102. *doi.org/10.1021/acs.est.5b03547.*

[139] Weisman, R., Heinrich, A., Letkiewicz, F., Messner, M., Studer, K., Wang, L., . . . Regli, S. (2022). Estimating National Exposures and Potential Bladder Cancer Cases Associated with Chlorination DBPs in U.S. Drinking Water. Environmental Health Perspectives, 130:8, 087002–1–087002–10. *ehp.niehs.nih.gov/doi/full/10.1289/EHP9985.*

2. Ecological Condition and Recreational Use Effects From Changes in Surface Water Quality Improvements

EPA evaluated whether the regulatory options in this proposal would alter aquatic habitats and human welfare by changing concentrations of harmful pollutants such as arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, nitrogen, phosphorus, and suspended sediment relative to baseline. As a result, the usability of some recreational waters relative to baseline discharge conditions could change under each option, thereby affecting recreational users. Changes in pollutant loadings can also change the attractiveness of recreational waters by making recreational trips more or less enjoyable. The regulatory options may also change nonuse values stemming from bequest, altruism, and



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existence motivations. Individuals may value water quality maintenance, ecosystem protection, and healthy species populations independent of any use of those attributes.

EPA uses a water quality index (WQI) to translate water quality measurements, gathered for multiple parameters that are indicative of various aspects of water quality, into a single numerical indicator that reflects achievement of quality consistent with the suitability for certain uses. The WQI includes seven parameters: dissolved oxygen, biochemical oxygen demand, fecal coliform, total nitrogen, total phosphorus, TSS, and one aggregate subindex for toxics. EPA modeled changes in four of these parameters and held the remaining parameters (dissolved oxygen, biochemical oxygen demand, and fecal coliform) constant for the purposes of this analysis.

EPA estimated the change in monetized benefit values using an updated version of the meta-regressions of surface water valuation studies used in the benefit analyses of the 2015 and 2020 rules. The meta-regressions quantify average household willingness to pay (WTP) for incremental improvements in surface water quality. Chapter 6 of the BCA provides additional detail on the valuation methodology.

Table XII–4 of this preamble presents annualized total WTP values for water quality changes associated with reductions in metal (arsenic, cadmium, chromium, copper, lead, mercury, zinc, and nickel), nonmetal (selenium), nutrient (phosphorus and nitrogen), and sediment pollutant discharges to the reach miles affected by the proposed regulatory options. An estimated 82 million households reside in Census block groups within 100 miles of reaches with steam electric plants affected under the proposed rule.[140] The central tendency estimate of the total annualized benefits of water quality changes for the proposed rule are $4.1 million using a three percent discount rate ($3.6 million using a seven percent discount rate).

TABLE XII–4—ESTIMATED TOTAL WTP FOR WATER QUALITY IMPROVEMENTS UNDER THE PROPOSED ELG OPTIONS COMPARED TO BASELINE

| Regulatory option | Number of affected households (million) | Average annual WTP per household (2021$) | Total annualized WTP (million 2021$) | |
|---|---|---|---|---|
| | | | 3% Discount rate | 7% Discount rate |
| Option 1 | 76.2 | $0.05 | $3.02 | $2.64 |
| Option 2 | 80.6 | 0.05 | 3.82 | 3.32 |
| Option 3 | 82.1 | 0.06 | 4.09 | 3.56 |
| Option 4 | 82.1 | 0.06 | 4.27 | 3.73 |

3. Changes in Air-Quality-Related Effects

EPA expects the proposed options to affect air pollution through three main mechanisms: (1) changes in auxiliary electricity use by steam electric facilities to operate wastewater treatment, ash handling, and other systems that facilities may use under each proposed option; (2) changes in transportation-related air emissions due to changes in trucking of CCR waste to landfills; and (3) changes in the electricity generation profile from increases in wastewater treatment costs compared to baseline and the resulting changes in EGU relative operating costs.

Changes in the electricity generation profile can increase or decrease air pollutant emissions because emission factors vary for different types of EGUs. For this analysis, the changes in air emissions are based on the change in dispatch of EGUs as projected by IPM after overlaying the costs of complying with the proposed rule onto EGUs' production costs. As discussed in Section VIII of this preamble, the IPM analysis accounts for the effects of other regulations on the electric power sector.

EPA evaluated potential effects resulting from net changes in air emissions of four pollutants: $CO_2$, $NO_X$, $SO_2$, and primary $PM_{2.5}$. $CO_2$ is a key GHG linked to a wide range of climate-related effects, and also the main GHG emitted from coal power plants. $NO_X$ and $SO_X$ are precursors to fine particles sized 2.5 microns and smaller ($PM_{2.5}$), which are also emitted directly, and $NO_X$ is an ozone precursor. These air pollutants cause a variety of adverse health effects including premature death, nonfatal heart attacks, hospital admissions, emergency department visits, upper and lower respiratory symptoms, acute bronchitis, aggravated asthma, lost work and school days, and acute respiratory symptoms.

Table XII–5 of this preamble shows the changes in emissions of $CO_2$, $NO_X$, $SO_2$, and primary $PM_{2.5}$ under the proposed rule (Option 3) relative to baseline for selected IPM run years. The proposed rule would result in a net reduction in air emissions of all four pollutants. This effect is driven mostly by the estimated changes in the profile of electricity generation, as emission reductions due to shifts in modeled EGU dispatch and energy sources offsets relatively small increases in air emissions from increased electricity use and trucking by steam electric plants.

[140] A reach is a section of a stream or river along which similar hydrologic conditions exist, such as discharge, depth, area, and slope.



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TABLE XII–5—ESTIMATED CHANGES IN AIR POLLUTANT EMISSIONS UNDER THE PROPOSED RULE COMPARED TO BASELINE

| Year | $CO_2$ (million metric tonnes/year) | $NO_X$ (thousand short tons/ year) | $SO_2$ (thousand short tons/ year) | Primary $PM_{2.5}$ (thousand short tons/ year) |
|---|---|---|---|---|
| 2028 | −0.7 | −1.9 | −1.0 | −0.12 |
| 2030 | −4.7 | −3.3 | −2.0 | −0.20 |
| 2035 | −10.5 | −5.1 | −5.8 | −0.32 |
| 2040 | −7.2 | −3.7 | −4.4 | −0.19 |
| 2045 | −11.9 | −7.5 | −9.3 | −0.75 |
| 2050 | −3.0 | −2.0 | −7.6 | −0.13 |

EPA estimated the monetized value of human health benefits among populations exposed to changes in $PM_{2.5}$ and ozone. The proposed rule is expected to alter the emissions of primary $PM_{2.5}$, $SO_2$ and $NO_X$, which will in turn affect the level of $PM_{2.5}$ and ozone in the atmosphere. Using photochemical modeling, EPA predicted the change in the annual average $PM_{2.5}$ and summer season ozone across the United States. EPA next quantified the human health impacts and economic value of these changes in air quality using the environmental Benefits Mapping and Analysis Program—Community Edition. EPA quantified effects using concentration-response parameters, which are consistent with those the Agency used in the PM NAAQS, Ozone NAAQS, and ACE RIAs (U.S. EPA, 2012; 2015; 2019).

To estimate the climate benefits associated with changes in $CO_2$ emissions, EPA used estimates of the social cost of carbon (SC–$CO_2$) to value changes in $CO_2$ emissions. The SC–$CO_2$ is the monetary value of the net harm to society associated with a marginal increase in $CO_2$ emissions in a given year, or the benefit of avoiding that increase.[141]

EPA estimates the climate benefits of $CO_2$ emission reductions expected from the proposed rule using the SC–$CO_2$ estimates presented by the Interagency Working Group on the Social Cost of Greenhouse Gases (IWG) in the February 2021 Technical Support Document (TSD): Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under E.O. 13990 (IWG 2021). These SC–$CO_2$ estimates are interim values developed under E.O. 13990 for use in benefit-cost analyses until updated estimates of the impacts of climate change can be developed based on the best available climate science and economics. EPA has evaluated the SC–$CO_2$ estimates in the TSD and have determined that these estimates are appropriate for use in estimating the climate benefits of $CO_2$ emission reductions expected from this proposed rule. After considering the TSD, and the issues and studies discussed therein, EPA finds that these estimates, while likely an underestimate, are the best currently available SC–$CO_2$ estimates. These SC–$CO_2$ estimates were developed over many years, using a transparent process, peer-reviewed methodologies, the best science available at the time of that process, and with input from the public.[142] The IWG is currently working on a comprehensive update of the SC–$CO_2$ estimates (under E.O. 13990) taking into consideration recommendations from the National Academies of Sciences, Engineering and Medicine, recent scientific literature, public comments received on the February 2021 TSD and other input from experts and diverse stakeholder groups. The EPA is participating in the IWG's work. In addition, while that process continues, EPA is continuously reviewing developments in the scientific literature on the SC–$CO_2$, including more robust methodologies for estimating damages from emissions, and looking for opportunities to further improve SC–$CO_2$ estimation going forward. Most recently, EPA has developed a draft updated SC–$CO_2$ methodology within a sensitivity analysis in the regulatory impact analysis of EPA's November 2022 supplemental proposal for oil and gas standards that is currently undergoing external peer review and a public comment process. See Chapter 8 of the BCA for more discussion of this effort.

Table XII–6 of this preamble shows the annualized climate change, $PM_{2.5}$, and ozone-related human health benefits for the proposed rule (Option 3). Climate change benefits are presented for each of four SC–$CO_2$ values and discounted using the same discount rate used in developing the SC–$CO_2$ values, whereas the $PM_{2.5}$ and ozone-related human health benefits are based on long-term ozone exposure mortality risk estimates and with three and seven percent discount rates. Consistent with the 2015 rule, summary benefits and net benefits estimates focus on the three percent (average) SC–$CO_2$ value. See Chapter 8 of the BCA report for benefits based on pooled short-term ozone exposure mortality risk estimate.

[141] In principle, the SC–$CO_2$ includes the value of all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk and natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services. The SC–$CO_2$ therefore, reflects the societal value of reducing emissions of by one metric ton. EPA and other Federal agencies began regularly incorporating estimates of SC–$CO_2$ in their benefit-cost analyses conducted under Executive Order (E.O.) 12866 since 2008, following a Ninth Circuit Court of Appeals remand of a rule for failing to monetize the benefits of reducing $CO_2$ emissions in a rulemaking process.

[142] As discussed in Chapter 8 of the BCA, these interim SC–$CO_2$ estimates have a number of limitations, including that the models used to produce them do not include all of the important physical, ecological, and economic impacts of climate change recognized in the climate-change literature and that several modeling input assumptions are outdated. As discussed in the February 2021 TSD, the IWG finds that, taken together, the limitations suggest that these SC–$CO_2$ estimates likely underestimate the damages from $CO_2$ emissions.



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TABLE XII–6—ESTIMATED CHANGES IN AIR POLLUTANT EMISSIONS UNDER THE PROPOSED RULE COMPARED TO BASELINE

[Millions of 2021$]

| $SC–CO_2$ | Climate change benefits | $PM_{2.5}$ and ozone related human health benefits at 3% discount rate [a] | Total | Climate change benefits | $PM_{2.5}$ and ozone related human health benefits at 7% discount rate | Total |
|---|---|---|---|---|---|---|
| 3% (Average) | $440 | $1,100 | $1,540 | $440 | $840 | $1,280 |
| 5% (Average) | 140 | 1,100 | 1,240 | 140 | 840 | 980 |
| 2.5% (Average) | 630 | 1,100 | 1,730 | 630 | 840 | 1,470 |
| 3% (95th Percentile) | 1,300 | 1,100 | 2,400 | 1,300 | 840 | 2,140 |

[a] Reflects long-term ozone exposure mortality risk estimate.

Estimates of monetized co-benefits shown here do not include several important benefit categories, such as direct exposure to $SO_2$, $NO_X$, and HAPs, including mercury and hydrogen chloride. Although EPA does not have sufficient information or modeling available to provide monetized estimates of changes in exposure to these pollutants for the proposed rule, EPA includes a discussion of these unquantified benefits in the BCA. For more information on the benefits analysis, see Chapter 8 of the BCA Report.

4. Other Quantified and/or Monetized Benefits

a. Changes in Dredging Costs

The four regulatory options would affect discharge loadings of various categories of pollutants, including TSS, thereby changing the rate of sediment deposition to affected waterbodies, including navigable waterways and reservoirs that require dredging for maintenance. Sediment buildup in navigable waterways, including rivers, lakes, bays, shipping channels, and harbors can reduce the navigable depth and width of the waterway. In many cases, periodic dredging is necessary to keep them passable. Reservoirs serve many functions, including storage of drinking and irrigation water supplies, flood control, hydropower supply, and recreation. Streams can carry sediment into reservoirs, where it can settle and cause buildup of silt layers over time. Sedimentation reduces reservoir capacity and the useful life of reservoirs unless measures such as dredging are taken to reclaim capacity. As it had done for the 2015 and 2020 rule analyses, EPA estimated changes in sedimentation and associated maintenance dredging costs in reaches and reservoirs affected by steam electric plant discharges. Chapter 9 of the BCA provides additional detail on the methodology.

EPA expects that the proposed rule may provide relatively small annualized cost savings ranging from $3,900 to $5,500 per year, using three percent and seven percent discount rates, respectively.

b. Benefits to Threatened and Endangered Species

To assess the potential for the rule to benefit threatened and endangered species (both aquatic and terrestrial) relative to the 2020 ELG baseline, EPA analyzed the overlap between waters expected to see reductions in wildlife water quality criteria exceedance status under a particular option and the known critical habitat locations of high-vulnerability threatened and endangered species. EPA examined the life history traits of potentially affected threatened and endangered species and categorized them by potential for population impacts due to surface water quality changes. Chapter 7 of the BCA Report provides additional detail on the methodology. EPA's analysis showed that there are 28 species whose known critical habitats overlap with surface waters where facilities may be affected by the proposed options. Improvements under the proposed rule between 2025 and 2029 are estimated to potentially benefit five species, including two species EPA categorized as having a higher vulnerability to water pollution (Colorado pikeminnow and Razorback sucker). Improvements projected after 2030 are estimated to benefit three species, including one higher vulnerability species (Topeka Shiner). Principal sources of uncertainty include the specifics of how changes under the regulatory options will impact threatened and endangered species, exact spatial distribution of the species, and additional species of concern not considered.

*C. Total Monetized Benefits*

Using the analysis approach described above, EPA estimated annualized benefits of the four regulatory options for all monetized categories. Table XII–7 and Table XII–8 of this preamble summarize the total annualized benefits using three percent and seven percent discount rates, respectively. The proposed rule (Option 3) has monetized benefits estimated at $1,557 million using a three percent discount rate and $1,290 million using a seven percent discount rate.

TABLE XII–7—SUMMARY OF TOTAL ESTIMATED ANNUALIZED MONETIZED BENEFITS AT THREE PERCENT

[Millions of 2021$]

| Benefit category | Option 1 | Option 2 | Option 3 | Option 4 |
|---|---|---|---|---|
| Human Health Effects from Water Quality Changes | $3.4 | $12.4 | $12.7 | $15.8 |
| Changes in IQ losses in children from exposure to lead [a] | <0.01 | <0.01 | 0.01 | 0.01 |
| Changes in IQ losses in children from exposure to mercury | 2.9 | 3.0 | 3.1 | 3.1 |
| Reduced cancer risk from disinfection byproducts in drinking water | 0.5 | 9.4 | 9.6 | 12.7 |
| Ecological Conditions and Recreational Use Changes | 3.0 | 3.8 | 4.1 | 4.3 |
| Use and nonuse values for water quality improvements | 3.0 | 3.8 | 4.1 | 4.3 |
| Market and Productivity [a] | <0.01 | <0.01 | <0.01 | <0.01 |



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TABLE XII–7—SUMMARY OF TOTAL ESTIMATED ANNUALIZED MONETIZED BENEFITS AT THREE PERCENT—Continued

[Millions of 2021$]

| Benefit category | Option 1 | Option 2 | Option 3 | Option 4 |
|---|---|---|---|---|
| Changes in dredging costs [a] | <0.01 | <0.01 | <0.01 | <0.01 |
| Air-Related Effects | 690 | 1,320 | 1,540 | 1,650 |
| Changes in $CO_2$ air emissions [b c] | 190 | 370 | 440 | 450 |
| Changes in human health effects from Changes in $NO_X$ and $SO_2$ emissions [b] | 500 | 950 | 1,100 | 1,200 |
| Total | 696 | 1,336 | 1,557 | 1,670 |

[a] "<$0.01" indicates that monetary values are greater than $0 but less than $0.01 million.
[b] EPA estimated the air-related benefits for Option 3 using IPM. EPA did not analyze Options 1, 2, and 4 using IPM. Instead, EPA extrapolated estimates for air-related benefits from Options 1, 2, and 4 from the estimate for Option 3 in proportion to social costs.
[c] Changes in $CO_2$ air emissions monetized using the SC–$CO_2$ at 3% (average). See Section XII.B.3 of this preamble for benefits monetized using other SC–$CO_2$ values.

TABLE XII–8—SUMMARY OF TOTAL ESTIMATED ANNUALIZED MONETIZED BENEFITS AT SEVEN PERCENT

[Millions of 2021$]

| Benefit category | Option 1 | Option 2 | Option 3 | Option 4 |
|---|---|---|---|---|
| Human Health Effects from Water Quality Changes | $0.8 | $6.6 | $6.8 | $8.8 |
| Changes in IQ losses in children from exposure to lead [a] | <0.01 | <0.01 | <0.01 | <0.01 |
| Changes in IQ losses in children from exposure to mercury | 0.5 | 0.6 | 0.6 | 0.6 |
| Reduced cancer risk from DBPs in drinking water | 0.3 | 6.1 | 6.2 | 8.3 |
| Ecological Conditions and Recreational Use Changes | 2.6 | 3.3 | 3.6 | 3.7 |
| Use and nonuse values for water quality improvements | 2.6 | 3.3 | 3.6 | 3.7 |
| Market and Productivity [a] | <0.01 | <0.01 | <0.01 | <0.01 |
| Changes in dredging costs [a] | <0.01 | <0.01 | <0.01 | <0.01 |
| Air-Related Effects | 570 | 1,070 | 1,280 | 1,320 |
| Changes in $CO_2$ air emissions [b c] | 190 | 370 | 440 | 450 |
| Changes in human health effects from Changes in $NO_X$ and $SO_2$ emissions [b] | 380 | 700 | 840 | 870 |
| Total | 573 | 1,080 | 1,290 | 1,333 |

[a] "<$0.01" indicates that monetary values are greater than $0 but less than $0.01 million.
[b] EPA estimated the air-related benefits for Option 3 using IPM. EPA did not analyze Options 1, 2, and 4 using IPM. Instead, EPA extrapolated estimates for air-related benefits from Options 1, 2, and 4 from the estimate for Option 3 in proportion to social costs.
[c] Changes in $CO_2$ air emissions monetized using the SC–$CO_2$ at 3% (average). See Section XII.B.3 for benefits monetized using other SC–$CO_2$ values.

*D. Additional Benefits*

The monetary value of the proposed rule's effects on social welfare does not account for all effects of the proposed options because, as described above, EPA is currently unable to quantify and/or monetize some categories. EPA anticipates the proposed rule would also generate important unquantified benefits, including but not limited to:

- health benefits to over 30 million people who will experience reductions in PWS-level arsenic, lead, and thallium concentrations, including reductions in unmonetized cancer and non-cancer effects from exposure to toxic pollutants from consumption of fish consumption or drinking water;
- reduced cardiovascular disease from changes in exposure to lead from fish consumption;
- unquantified and unmonetized averted IQ losses and educational effects from childhood lead exposure and *in-utero* mercury exposure from fish consumption by households that do not engage in recreational and subsistence fishing;
- reduced cancer morbidity effects beyond medical expenses;
- improved habitat conditions for plants, invertebrates, fish, amphibians, and the wildlife that prey on aquatic organisms;
- enhanced ecosystem productivity and health, including reduced toxic discharges into habitats for over 100 high-vulnerability threatened and endangered species;
- changes to water treatment costs for drinking water, irrigation, and agricultural uses;
- changes in fisheries yield and harvest quality from aquatic habitat changes;
- changes in health hazards from recreational exposures; and
- groundwater quality impacts.

While some health benefits and willingness to pay for water quality improvements have been partially quantified and/or monetized, those estimates may not fully capture all important water quality-related benefits. Although the following quantifications cannot necessarily be combined with other monetized effects, another way to characterize the benefits is that the proposed rule is expected to result in a 12.5 percent reduction in chronic exceedances and a 100 percent reduction in acute exceedances of the national recommended water quality criteria, and up to an 82 percent reduction in the number of reaches with ambient concentrations exceeding human health criteria for at least one pollutant.

The BCA Report discusses changes in these potentially important effects qualitatively, indicating their potential magnitude where possible. EPA will continue to seek to enhance its approaches to quantify and/or monetize a broader set of benefits for any final rule and solicits comment on monetizing some of these additional



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benefits categories consistent with the approach discussed in IPI (2022).[143]

**XIII. Environmental Justice Impacts**

Consistent with EPA's commitment to integrating environmental justice (EJ) in the Agency's actions, the Agency has analyzed the impacts of this action on communities with EJ concerns and sought input and feedback from stakeholders representing these communities. EPA has prepared this analysis to implement the recommendations of the Agency's EJ Technical Guidance.[144] For ELG rulemakings, this analysis is typically conducted as part of the BCA alongside other nonstatutorily required analyses such as monetized benefits, but for this action was placed in a standalone Environmental Justice Analysis (EJA) document to present in more detail the potential EJ impacts of this proposal and the initial outreach to communities with potential EJ impacts. This analysis is intended to provide the public with a discussion of the potential EJ impacts of this proposal. The analysis does not form a basis or rationale for any of the actions EPA is proposing in this rulemaking. Executive Order 12898 is discussed in Section XI.J of this preamble.

Overall, the analysis showed that benefits associated with improvements to water quality, wildlife, and human health resulting from reductions in pollutants in surface water and drinking water will accrue to minority and low-income populations at a higher rate under some or all of the proposed regulatory options. Remaining exposures, impacts, costs, and benefits analyzed either accrue at a higher rate to populations which are not minority or low-income, accrue proportionately to all populations, or are small enough that EPA could not conclude whether changes in disproportionate impacts would occur. While the changes in GHGs attributable to the proposed regulatory options are relatively small compared to worldwide emissions, findings from peer-reviewed evaluations demonstrate that actions that reduce GHG emissions are also likely to reduce climate impacts on vulnerable communities, including minority and low-income communities. The methods and findings of the EJA are described in further detail below.

*A. Literature Review*

EPA conducted a literature review to identify academic research and articles on EJ concerns related to coal-fired power plants. EPA identified four papers that focused on coal-fired power plants in the United States that were directly relevant to this proposed rule. The findings of these papers suggest that coal-fired power plants tend to be in poor, minority, and indigenous communities. Toomey (2013) reported that 78 percent of African Americans in the United States live within a 30-mile radius of a coal-fired power plant.[145] Impacts discussed in the reports included adverse health impacts resulting from air pollutants (*e.g.,* $SO_2$, $NO_X$, $PM_{2.5}$) for those living in proximity to coal-fired power plants, climate justice issues resulting from GHG emissions, and risk of impoundment failures for populations living in proximity to coal waste surface impoundments where coal is mined.[146] [147] [148] All these impacts were found in one or more papers to disproportionately impact poor, minority, and indigenous communities. EPA solicits comment on additional literature that discusses EJ impacts related to the specific changes being made to steam electric power plants. For further discussion of the literature review, see section 5 of the EJA.

*B. Screening Analysis and Community Outreach*

EPA performed a set of screening analyses with the EJSCREENBatch tool to identify the environmental and socioeconomic characteristics of the communities that are expected to be impacted by discharges from steam electric plants via relevant exposure pathways. First, EPA conducted a screening for potential air impacts using one- and three-mile buffers around the facility GIS coordinates. Second, EPA conducted a screening for potential impacts in downstream surface waterbodies using one-, three-, 50-, and 100-mile buffer distances around each waterbody segment downstream of the initial common identifiers (COMIDs) identified for each effluent discharge.[149] Finally, EPA conducted a screening for potential drinking water impacts using ZIP code information for downstream public water systems (PWSs) in the absence of a complete data set of actual service area boundaries for all PWSs.

Using the results of these screening analyses, EPA tiered communities under all three screening analyses to prioritize communities for potential outreach and engagement. To tier the communities, EPA evaluated how many of the following criteria applied to a community's screening results:

- The community has both demographic (minority and low income [150]) indicators and at least one environmental indicator [151] above the 50th percentile nationally or has all environmental indicators and at least one demographic indicator above the 50th percentile nationally;
- The community has two or more demographic and/or environmental indicators above the 80th percentile nationally;
- The community has one or more demographic and/or environmental indicators above the 90th percentile nationally; or
- The community has one or more demographic and/or environmental indicators above the 95th percentile nationally.

Tier 3 communities met one of the above criteria, Tier 2 communities met two or three of the above criteria, and Tier 1 communities met all four of the above criteria. EPA sought to conduct initial outreach meetings with nine communities. Thus, for each of the three screening analyses (air, surface water, and drinking water), EPA selected the top three Tier 1 communities for outreach. For the latter two screening analyses, there were no Tier 1 communities in scope. In these cases,

[143] IPI (Institute for Policy Integrity). June 2022. *Measuring the Benefits of Power Plant Effluent Regulation: The 2020 Steam Electric Reconsideration Rule and Potential Future Methods.*

[144] U.S. EPA (Environmental Protection Agency). 2016. *Technical Guidance for Assessing Environmental Justice in Regulatory Analysis.* June. Available online at: *www.epa.gov/environmentaljustice/technical-guidance-assessing-environmental-justice-regulatory-analysis.*

[145] Toomey, Diane. 2013. *Coal Pollution and the Fight for Environmental Justice.* Yale Environment 360. June 19. Available online at: *www.e360.yale.edu/features/naacp_jacqueline_patterson_coal_pollution_and_fight_for_environmental_justice.*

[146] Liévanos, R.S., P. Greenberg, and R. Wishart. 2018. *In the Shadow of Production: Coal Waste Accumulation and Environmental Inequality Formation in Eastern Kentucky.* Social Science Research, Vol. 71: pp. 37–55.

[147] Israel, B. 2012. *Coal Plants Smother Communities of Color.* Scientific American. *www.scientificamerican.com/article/coal-plants-smother-communities-of-color/#:~:text=People%20living%20near%20coal%20plants,percent%20are%20people%20of%20color.*

[148] NAACP. 2012. National Association for the Advancement of Colored People. *Coal Blooded: Putting Profits Before People. www.naacp.org/resources/coal-blooded-putting-profits-people.*

[149] Defined as 300 kilometers (~187 miles).

[150] The minority and low-income indicators are derived from EPA's Environmental Justice Screening and Mapping Tool (EJSCREEN). For more information on EJSCREEN's definitions of minority and low income, *see* U.S. EPA. 2019. U.S. Environmental Protection Agency. *EJSCREEN Technical Documentation. www.epa.gov/ejscreen/technical-information-about-ejscreen.*

[151] EPA used environmental indicators from EJSCREEN that include direct and proxy indicators of potential pollution exposures. For more information on the environmental indicators included in EJSCREEN *see* U.S. EPA (2019).



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EPA supplemented up to three by adding either the top Tier 2 communities or communities EPA had engaged with prior to the decision to conduct the current rulemaking. A list of communities and selection criteria is presented in Table XIII–1 of this preamble. The communities that EPA engaged with prior to the initiation of the current rulemaking are indicated by a ''YES'' in the Pre-Rule column.

EPA conducted initial outreach to local environmental and community development organizations, local government agencies, and individual community members involved in community organizing in all nine communities. Between May and September of 2022, EPA was able to meet with community members in five of the identified communities either virtually (indicated in the table by ''Virtual Meeting'') or in a hybrid format with some in-person participation (indicated in the table by ''Hybrid Meeting''). While EPA has not been able to hold a virtual or hybrid meeting with the remaining four communities (those indicated in the table as ''Initial Outreach''), EPA is continuing to consider whether and how to engage with these communities. Each meeting began with a presentation providing background information about the rulemaking before opening the meeting for questions and comments from community members.

EPA received a broad range of input from individuals in these communities on regulatory preferences, environmental concerns, human health and safety concerns, economic impacts, cultural/spiritual impacts, ongoing communication/public outreach, and interest in other EPA actions. Two broad themes were conveyed consistently across communities. First, community members conveyed several perceived harmful impacts from steam electric power plants and their desire for more stringent regulations to reduce these harmful impacts. Second, community members expressed the desire for more transparency and communication to overcome their decreasing trust in the regulated power plants and state regulatory agencies and, thus, a corresponding skepticism that their community would be protected from these harmful impacts. In addition to these broad themes, commenters also raised concerns unique to each community. For example, members of the Navajo Nation discussed with EPA the spiritual and cultural impacts to the community from pollution related to steam electric power plants. In Jacksonville, Florida, community members raised concerns regarding tidal flows of pollution upstream and storm surges during extreme weather events which cause additional challenges in their community. More detailed summaries of these meetings are described in section 7.5 of the EJA.

TABLE XIII–1—INITIAL COMMUNITY OUTREACH SELECTION

| # | Screening result (plant/waterbody/PWS) [a] | State | Screen | Tier | Pre-Rule [b] | Proposal |
|---|---|---|---|---|---|---|
| 1 | EIA #667, Northside Generating Station | FL | Air | 1 | | Virtual Meeting. |
| 2 | EIA #3297, Wateree Station | SC | Air | 1 | | Initial Outreach. |
| 3 | EIA #2442, Four Corners Steam Electric Station | NM | Air | 1 | YES | Virtual Meeting. |
| 4 | COMID 10161978, Ohio River (EIA #6071, Trimble County). | KY | Surface Water | 2 | | Virtual Meeting. |
| 5 | COMID 6499098, Etowah River (EIA #703, Plant Bowen). | GA | Surface Water | 2 | | Initial Outreach. |
| 6 | COMID 3124250, Rabbs Bayou (EIA #3470, W.A. Parish E.G.S.). | TX | Surface Water | 2 | | Hybrid Meeting. |
| 7 | PWSID 84690510, Standing Rock Rural Water System, Fort Yates (EIA #2817, Leland Olds Station). | ND | Drinking Water | 2 | | Initial Outreach. |
| 8 | PWSID MI0001800, City of Detroit (EIA #6034, Belle River Power Plant and EIA #1733, Monroe Power Plant). | MI | Drinking Water | 2 | | Initial Outreach. |
| 9 | PWSID NC0279010, NC0279030, NC0279040, and NC3079031 Town of Eden, Town of Madison, Dan River Water Inc, Rockingham Co—220 Corridor (EIA #8042, Belews Creek Steam Station). | NC | Drinking Water | 3 | YES | Hybrid Meeting. |

**Notes:**

[a] Steam electric power plants, surface waters, and PWSs are identified by their U.S. Energy Information Administration (EIA) identification number, National Hydrography Dataset Plus (NHDPlus) V2.1 common identifier (COMID), and Safe Drinking Water Information System (SDWIS) Public Water System ID (PWSID).

[b] While not included in the list of communities for outreach, EPA also met with members of Clean Power Lake County before the supplemental rule announcement to discuss potential EJ impacts of the Waukegan Power Plant, a plant that is retired.

EPA considered all feedback received in these outreach meetings, including feedback regarding the stringency of potential new regulations and negative impacts experienced as a result of steam electric discharges. The proposed rule, if finalized, would result in more stringent limitations that would further reduce negative impacts associated with steam electric discharges. EPA also considered feedback expressing the desire for increased transparency and communication. As discussed in Section XV.C.5 of this preamble, EPA is proposing posting of required reports to a publicly available website to improve transparency. Furthermore, EPA calls attention to the availability of the more recent feature of Enforcement and Compliance History Online (ECHO) called ECHO Notify. ECHO Notify provides weekly email notifications of changes to enforcement and compliance data in ECHO. Notifications are tailored to the geographic locations, facility IDs, and notification options that users select. EPA encourages interested community members to sign up for these alerts. Further information is available on EPA's website at *www.echo.epa.gov/tools/echo-notify.* EPA also encourages individual facilities to work with local communities to foster trust and communication, for example, through text alert systems. Finally, EPA solicits

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comment on whether and how the Agency could update its analyses to reflect the site-specific information presented in these meetings.

*C. Distribution of Risks*

EPA evaluated the distribution of pollutant loadings, estimated human health, and estimated environmental impacts resulting from polluted air, surface water, and drinking water. EPA examined these distributions under both baseline and the regulatory options to identify where current conditions and future improvements may have a disproportionate impact on communities with potential EJ concerns (PEJC). The following sections discuss EPA's methodology and findings.

1. Air

EPA evaluated air quality impacts in terms of changes in warm season maximum daily average 8-hour (MDA8) ozone and average annual $PM_{2.5}$ concentrations, as described in the BCA. EPA used the results of the analysis to further evaluate the distribution of air quality impacts in the EJA to determine whether population groups of concern experience disproportionately high exposures to MDA8 ozone and average annual $PM_{2.5}$ under baseline and Option 3.

The results of EPA's analysis of baseline MDA8 ozone and average annual $PM_{2.5}$ concentrations showed that there are differences in baseline exposures across population groups and area categories (no change, improving, worsening). EPA found that Option 3 results in similar absolute and relative changes in MDA8 ozone and average annual $PM_{2.5}$ exposures across population groups in areas with improving and worsening air quality. The modeled changes in MDA8 ozone and average annual $PM_{2.5}$ exposures generated by Option 3 are relatively small and not expected to have significant impacts on distributional disparities. For more information on the analysis of air quality impacts, see section 9.1 of the EJA.

2. Surface Water

EPA evaluated both immediate receiving waters [152] and downstream surface waters,[153] as described in the EA and BCA.

a. Immediate Receiving Waters

Using results from the immediate receiving water analysis performed in the EA, EPA further evaluated the immediate receiving water impacts in the EJA to determine whether these impacts disproportionately affect population groups of concern. This analysis was done with respect to waters that exceeded benchmarks for national recommended water quality criteria (NRWQC) and maximum contaminant levels (MCLs), benchmarks for sediment biota and piscivorous wildlife, and human health benchmarks.

b. Distribution of Water Quality Impacts

After examining baseline results of the EA where arsenic, cadmium, selenium, or thallium concentrations exceeded benchmark NRWQC and MCL values,[154] EPA's analysis showed that, in communities with immediate receiving waters with pollutant-specific benchmark exceedances, the percent of the population identified as American Indian or Alaskan Native (non-Hispanic) is larger than the national average. This result is driven by baseline exceedances observed in the Unnamed tributary to the Chaco River, which is in the Navajo Nation, an area in which about 98 percent of the population is identified as American Indian or Alaska Native (non-Hispanic). When compared to communities with immediate receiving waters without exceedances, communities with immediate receiving waters with exceedances had larger proportions of the population identifying as African-American (non-Hispanic), American Indian or Alaskan Native (non-Hispanic), Other (non-Hispanic), and Hispanic or Latino. Based on these findings regarding the distribution of population groups of concern in communities with immediate receiving waters with exceedances, EPA concluded that there are PEJC present under the baseline. EPA's analysis of the regulatory options showed that all regulatory options resulted in a reduction in the number of immediate receiving waters with pollutant-specific benchmark exceedances and in the population affected by these exceedances compared to the baseline. Options 3 and 4 generated the largest reductions in immediate receiving waters with exceedances and the affected population relative to the baseline. Furthermore, Options 3 and 4 produced the greatest improvements in the distribution of water quality impacts across population groups of concern relative to the baseline when comparing proportions of these populations to the national average and communities with immediate receiving waters without exceedances. For more information on the results of the water quality impact analysis, see section 9.2.1.1 of the EJA.

c. Distribution of Wildlife Impacts

After examining baseline results of the EA where sediment biota, eagle, and mink impacts exceeded benchmark values, EPA's analysis showed that communities with immediate receiving waters with exceedances had a larger proportion of the population identified as American Indian or Alaskan Native (non-Hispanic) than the national average. Additionally, communities with immediate receiving waters with exceedances under baseline had larger proportions of various population groups of concern than communities with immediate receiving waters without exceedances. Based on these findings regarding the distribution of population groups of concern in communities with immediate receiving waters with exceedances, EPA concluded that there are PEJC present under the baseline. EPA's analysis of wildlife impacts under the regulatory options showed that none of the regulatory options results in increases in the number of immediate receiving waters with exceedances of wildlife- and pollutant-specific benchmarks compared to the baseline. Across the wildlife analyses, Options 3 and 4 generated the largest reductions in the number of immediate receiving waters with exceedances and in the affected population compared to the baseline. Furthermore, relative to the baseline, Options 3 and 4 produced the greatest improvements in the distribution of wildlife impacts across population groups of concern when comparing proportions of these populations to the national average and communities with immediate receiving waters without exceedances. For more information on the analysis of wildlife impacts, see section 9.2.1.2 of the EJA.

d. Distribution of Human Health Risks

After examining baseline results of the EA where fish consumer cohort- and pollutant-specific noncancer hazard quotients and lifetime excess cancer risks exceeded benchmark values,[155] the record indicates that across all fish consumer cohorts, communities with

[152] The immediate receiving water analysis focused on evaluating baseline and regulatory impacts at the point of discharges in surface waters receiving wastewater discharges from steam electric power plants.

[153] The downstream analysis focused on evaluating baseline and regulatory impacts 300 kilometers (~187 miles) downstream from the point of discharges in surface waters receiving wastewater discharges from steam electric power plants.

[154] The IRW Model did not identify any immediate receiving waters with benchmark value exceedances under the baseline for copper, lead, mercury, nickel, and zinc loadings.

[155] Fish consumer cohorts analyzed were child subsistence, child recreational, adult subsistence, and adult recreational fish consumers.



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immediate receiving waters with noncancer and cancer exceedances have larger proportions of the population identified as population groups of concern, particularly American Indian or Alaskan Native (non-Hispanic), than the national average. This result is driven by baseline exceedances observed in the Unnamed tributary to the Chaco River, which is in the Navajo Nation. Additionally, communities with immediate receiving waters with noncancer and cancer exceedances have larger proportions of the population identified as population groups of concern than communities with immediate receiving waters without noncancer and cancer exceedances. Based on these findings regarding the distribution of population groups of concern in communities with immediate receiving waters with noncancer and cancer exceedances, EPA concluded that there are PEJC present under the baseline. EPA's analysis under the regulatory options showed human health improvements, in terms of the reduction in the number of immediate receiving waters with noncancer and cancer benchmark exceedances, across fish consumer cohorts. Options 3 and 4 generated the largest reductions in the number of immediate receiving waters with noncancer and cancer exceedances and in the affected population. Additionally, Options 3 and 4 produced the greatest improvements in the distribution of human health impacts across population groups of concern relative to the baseline when comparing proportions of these populations to the national average and communities with immediate receiving waters without exceedances. For more information on the analysis of human health risks, see section 9.2.1.3 of the EJA.

e. Downstream Waters

Using the results from the downstream analysis performed in the BCA, EPA further evaluated the downstream surface water impacts in the EJA to determine whether population groups of concern experience a disproportionate share of noncancer and cancer health effects from exposure to lead, mercury, and arsenic through consuming fish in contaminated downstream surface waters. The results of EPA's analysis are discussed in the following two sections.

f. Distribution of Noncancer Health Impacts

Noncancer health impacts evaluated by EPA were cognitive and neurological impacts—expressed as total IQ points under baseline and avoided IQ point losses under the regulatory options—among children exposed to lead and mercury through consuming fish at subsistence and recreational consumption rates caught in contaminated surface waters. The distribution of impacts within the two consumer cohorts was evaluated by racial and ethnic group (White, Black, Hispanic, Asian, American Indian and Alaskan Native, and Other) and by income group (below the poverty line or not below the poverty line). When comparing across income groups and racial and ethnic groups, baseline results of the analysis of neurological and cognitive health impacts from exposure to lead and mercury showed that population groups of concern in the children of subsistence and recreational cohorts had a proportional or larger share of total baseline IQ points compared to their share of the exposed population. The results of the analysis indicated no disparate IQ impacts to minority and low-income groups under baseline.

Based on EPA's evaluation of the four regulatory options, each of the regulatory options would result in avoided IQ point losses for children of subsistence fishers and recreational fishers who regularly consume fish caught in local water compared to baseline across all racial, ethnic, and income groups in the children of both subsistence and recreational consumer cohorts. While children of all racial and ethnic population groups in the subsistence and recreational cohorts are expected to experience avoided IQ point losses under the regulatory options compared to baseline, these improvements were relatively small and did not change the distribution of IQ points compared to baseline. For more information on the analysis of noncancer health impacts in downstream surface waters, see section 9.2.2.1 and section 9.2.2.2 of the EJA.

g. Distribution of Cancer Health Impacts

EPA evaluated national cancer health impacts—in terms of cancer cases (any type of cancer) under baseline and avoided cancer cases (any type of cancer) under the regulatory options—among adult subsistence and recreational fishers exposed to arsenic through fish consumption. The distribution of impacts within the two fisher cohorts was evaluated by racial and ethnic group and by income group.

When comparing total cancer cases across racial and ethnic groups, the results of the baseline analysis showed that population groups of concern (except for those in the Black population group) in the adult subsistence fisher cohort had a larger proportion of cancer cases compared to their share of the exposed population. In contrast, when comparing total cancer cases across income groups, the results of the baseline analysis showed that those below the poverty line in both the adult subsistence and recreational fisher cohorts had a smaller proportion of cancer cases compared to their share of the exposed population, while those not below the poverty line in both fisher cohorts had a larger proportion of cancer cases. The results of the analysis indicate PEJC in the baseline related to the distribution of cancer health impacts when comparing across racial and ethnic population groups, but not across income groups.

Based on EPA's evaluation of the four regulatory options, each of the regulatory options would result in avoided cancer cases compared to baseline across all racial, ethnic, and income population groups in both the adult subsistence and recreational fisher cohorts. While all racial, ethnic, and income population groups in the adult subsistence and recreational fisher cohorts were expected to experience avoided cancer cases under the regulatory options compared to baseline, these improvements were relatively small and did not change the distribution of total cancer cases compared to baseline. For more information on the analysis of cancer health impacts in downstream surface waters, see section 9.2.2.3 of the EJA.

3. Drinking Water

Using the results from the drinking water analysis performed in the BCA, EPA further evaluated downstream drinking water impacts in the EJA to determine whether population groups of concern served by potentially affected drinking water systems experience a disproportionate share of bladder cancer cases from exposure to TTHM. In the BCA, EPA modeled baseline incremental TTHM concentrations and bladder cancer cases attributable to steam electric discharges.[156] Since EPA evaluated only the changes in TTHM concentrations and avoided bladder cancer cases and deaths attributable to steam electric discharges in the BCA, in this analysis, EPA only evaluated whether the distribution of exposures and health effects indicated PEJC under the incremental changes resulting from the regulatory options. The results of

[156] Background TTHM concentrations and bladder cancer cases attributable to sources other than steam electric discharges were not modeled under the baseline but would not impact the analysis of incremental changes as discussed in the BCA.



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EPA's analysis are discussed in the following two sections.

a. Distribution of TTHM Exposures and Resulting Avoided Bladder Cancer Cases and Deaths

Based on EPA's evaluation of the four regulatory options, EPA's record shows that all regulatory options would result in decreases in TTHM concentrations and cases of bladder cancer and deaths across potentially affected drinking water systems. Of the regulatory options EPA evaluated, across the states with affected systems, Option 4 generated the greatest reductions in TTHM concentrations and bladder cancer cases and deaths. Under all of the regulatory options, for those potentially affected systems with modeled reductions in TTHM concentrations and in bladder cancer cases and deaths, most serve populations that have a higher proportion of at least one population group of concern as compared to the national average, with the largest proportion serving populations with two population groups of concern above the national average. Additionally, EPA found that states with affected systems serving populations with one population group of concern above the national average experienced the largest median reductions in TTHM concentrations and bladder cancer cases and deaths. Furthermore, EPA found that the magnitude of the median change in TTHM and bladder cancers decreased with the more stringent regulatory options in communities with one, two, or three or more population groups of concern above the national average. EPA determined that this was not due to there being fewer reductions in TTHM concentrations and in bladder cancer cases and excess bladder cancer deaths with more stringent options, but rather that more new states with affected systems experiencing smaller changes were being added under the more stringent options. Therefore, Option 4 still generated the greatest improvements across analyses. For more information of the analysis of drinking water impacts, see sections 9.3.1 and 9.3.2 of the EJA.

4. Cumulative Risks

In the EA, EPA expanded upon its assessment of human health impacts from individual pollutant exposures to include an evaluation of potential human health risks from exposures to mixtures of pollutants present in steam electric power plant discharges. Using information on human health risks related to pollutant mixtures from the Agency for Toxic Substances and Disease Registry (ATSDR), EPA estimated potential human health risks among fish consumer cohorts exposed to pollutant mixtures of concern—Arsenic-Cadmium-Lead (As-Cd-Pb), Zinc-Lead (Zn-Pb), and Methylmercury-Lead (MeHg-Pb)—from consuming fish caught in potentially affected immediate receiving waters of steam electric power plants. EPA used the results of this analysis to assess the distribution of potential human health risks across population groups of concern in communities with immediate receiving waters with human health endpoint-specific Hazard Index (HI) exceedances.

After examining baseline results of the EA where human health endpoint-specific HI values were greater than 1, the record indicates that across mixtures of concern and fisher cohorts, EPA found that in communities with immediate receiving waters with exceedances there are larger proportions of the population identified as groups of concern, particularly American Indian or Alaskan Native (non-Hispanic), than the national average. This result is driven by baseline exceedances observed in the Unnamed tributary to the Chaco River, which is in the Navajo Nation. Additionally, the record indicates that across mixtures of concern and cohorts, communities with immediate receiving waters had larger proportions of various population groups of concern under the baseline than communities with immediate receiving waters without exceedances. Based on these findings regarding the distribution of population groups of concern in communities with immediate receiving waters with exceedances, EPA concluded that there are PEJC present under the baseline.

EPA's analysis under the regulatory options showed that, across mixture of concern and cohorts, none of the regulatory options results in increases in the number of immediate receiving waters with exceedances and in the population affected compared to the baseline. Across mixtures of concern and cohorts, Options 3 and 4 most often generated the largest reductions relative to the baseline in immediate receiving water with exceedance and in the population affected. Additionally, Options 3 and 4 most often produced the greatest proportional reductions in the distribution of human health impacts for population groups of concern in communities with immediate receiving waters with exceedances compared to the national average and communities with immediate receiving waters without exceedances. For more information on the analysis of potential cumulative human health risks, see section 9.4 of the EJA.

*D. Distribution of Benefits and Costs*

EPA examined the estimated benefits and costs of the regulatory options in this proposal for potential differences in how they are distributed across socioeconomic groups, in addition to evaluating the distribution of exposures and health impacts discussed above. Office of Management and Budget (OMB) Circular A–4, which implements E.O. 12866, states that regulatory analyses ''should provide a separate description of distributional effects (*i.e.,* how both benefits and costs are distributed among sub-populations of particular concern).'' As discussed below, EPA research demonstrates that climate change impacts are likely to accrue to minority and low-income populations, but other benefits and costs under the proposed rule may not have substantial impacts.

EPA began its evaluation of benefits with a screening of the benefits categories. For Option 3, at both three percent and seven percent discount rates, approximately 99 percent of monetized benefits accrued from reductions in air pollution due to estimated shifts in electric generation resulting from the incremental costs of the proposed rule. Furthermore, these air benefits were always comprised of approximately a 3-to-1 ratio of conventional air pollutant health benefits to GHG benefits.[157] Thus, while EPA evaluated a number of exposures and endpoints for disproportionate baseline impacts, the Agency screened these two benefit categories through this initial comparison for further evaluation.

With respect to GHG benefits, scientific assessments and Agency reports produced over the past decade by the U.S. Global Change Research Program,[158] [159] the Intergovernmental Panel on Climate Change,[160] [161] [162] [163]

[157] EPA scaled the air benefits to other regulatory options based on total costs.

[158] USGCRP, 2018. Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. *doi.org/10.7930/NCA4.2018.*

[159] USGCRP, 2016. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. Crimmins, A., J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska, Eds. U.S. Global Change Research Program, Washington, DC, 312 pp. *www.dx.doi.org/10.7930/J0R49NQX.*

[160] Oppenheimer, M., M. Campos, R.Warren, J. Birkmann, G. Luber, B. O'Neill, and K. Takahashi,



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and the National Academies of Science, Engineering, and Medicine [164] [165] provide evidence that the impacts of climate change raise PEJC. These reports conclude that poorer or predominantly non-White communities can be especially vulnerable to climate change impacts because they tend to have limited adaptive capacities, are more dependent on climate-sensitive resources such as local water and food supplies, or have less access to social and information resources. Some communities of color, specifically populations defined jointly by ethnic/racial characteristics and geographic location, may be uniquely vulnerable to climate change health impacts in the United States.

EPA recently conducted a peer-reviewed analysis of the distribution of climate change impacts. EPA (2021) evaluated the disproportionate risks to socially vulnerable populations (defined based on age, income, education, race, and ethnicity) associated with six impact categories: air quality and health, extreme temperature and health, extreme temperature and labor, coastal flooding and traffic, coastal flooding and property, and inland flooding and property.[166] EPA calculated risks for each socially vulnerable group relative to its ''reference population'' (all individuals outside of each group) for scenarios with 2 °C of global warming or 50 centimeters of sea level rise. The estimated risks were based on current demographic distributions in the contiguous United States. EPA (2021) includes findings [167] that the following groups are more likely than their reference population to currently live in areas with:

- The highest increases in childhood asthma diagnoses from climate-driven changes in $PM_{2.5}$ (low-income, Black and African American, Hispanic and Latino, and Asian populations);
- The highest percentage of land lost to inundation (low-income and American Indian and Alaska Native populations);
- The highest increases in mortality rates due to climate-driven changes in extreme temperatures (low-income and Black and African American populations);
- The highest rates of labor hour losses for weather-exposed workers due to extreme temperatures (low-income, Black and African American, American Indian and Alaska Native, Hispanic and Latino, and Pacific Islander populations);
- The highest increases in traffic delays associated with high-tide flooding (low-income, Hispanic and Latino, Asian, and Pacific Islander populations); and
- The highest damages from inland flooding (Pacific Islander populations).

For further discussion of the impacts analyzed in U.S. EPA (2021) and other peer-reviewed evaluations, see section 10.1.1 of the EJA.

EPA notes that the changes in GHG emissions attributable to the proposed regulatory options are relatively small compared to worldwide emissions. Nevertheless, the findings of peer-reviewed evaluations demonstrate that actions that reduce GHG emissions are likely to reduce climate impacts on vulnerable communities such as minority and low-income populations.

With respect to conventional air pollutant health benefits, the current EPA modeling methodology results in benefits that are proportional to exposures. In other words, the distributional findings of air pollutant exposures discussed above are the same findings EPA has for this benefit category: exposure and health benefit improvements and degradations attributable to this proposal will be proportionately experienced by all demographic populations evaluated. However, there are several important nuances and caveats to this conclusion owing to differences in vulnerability and health outcomes across population subgroups. For example, there is some information suggesting that the same $PM_{2.5}$ exposure reduction will reduce the hazard of mortality more so in Black populations than in White populations.[168] [169] In addition, demographic-stratified information relating $PM_{2.5}$ and ozone to other health effects and valuation estimates is currently lacking.

With respect to costs, EPA notes that the impacts on ratepayers will depend on the degree to which compliance costs are passed through to electricity consumers via higher electricity rates. In general, lower-income households spend less, in the absolute, on energy than higher-income households, but energy expenditures represent a larger share of their income. Therefore, electricity price increases tend to have a relatively larger effect on lower-income households. Further discussion of these disparities is provided in

2014: Emergent risks and key vulnerabilities. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 10391099.

[161] Porter, J.R., L. Xie, A.J. Challinor, K. Cochrane, S.M. Howden, M.M. Iqbal, D.B. Lobell, and M.I. Travasso, 2014: Food security and food production systems. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 485–533.

[162] Smith, K.R., A.Woodward, D. Campbell-Lendrum, D.D. Chadee, Y. Honda, Q. Liu, J.M. Olwoch, B. Revich, and R. Sauerborn, 2014: Human health: impacts, adaptation, and co-benefits. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 709–754.

[163] IPCC (Intergovernmental Panel on Climate Change), 2018. Global Warming of 1.5 °C, An IPCC Special Report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

[164] National Research Council. 2011. America's Climate Choices. Washington, DC: The National Academies Press. *www.doi.org/10.17226/12781.*

[165] NASEM. 2017. Communities in Action: Pathways to Health Equity. Washington, DC: The National Academies Press. *www./doi.org/10.17226/24624.*

[166] U.S. EPA (Environmental Protection Agency). 2021. *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts.* U.S. Environmental Protection Agency, EPA 430–R–21–003.

[167] EPA (2021) also noted that American Indian and Alaska Native individuals may place a high value on risks to subsistence, cultural, and other natural resources that were not explored in the report. This is consistent with concerns raised by tribal community members as part of the outreach discussed above.

[168] U.S. EPA (2019). Integrated Science Assessment (ISA) for Particulate Matter (Final Report). U.S. Environmental Protection Agency, Office of Research and Development, Center for Public Health and Environmental Assessment. Research Triangle Park, NC. U.S. EPA. EPA/600/R–19/188. December 2019. Available at: *www.epa.gov/naaqs/particulate-matter-pm-standards-integrated-science-assessments-current-review.*

[169] U.S. EPA (2022). Supplement to the 2019 Integrated Science Assessment for Particulate Matter (Final Report). U.S. Environmental Protection Agency, Office of Research and Development, Center for Public Health and Environmental Assessment. Research Triangle Park, NC. U.S. EPA. EPA/600/R–22/028. May 2022. Available at: *www.epa.gov/isa/integrated-science-assessment-isa-particulate-matter.*



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section 10.2 of the EJA. EPA estimated the potential impacts of incremental ELG compliance costs on households' utility bills based on average electricity consumption and assuming a worst-case scenario where all costs are passed through to consumers. EPA estimated that the proposed rule corresponds to an average increase of $0.63 per household per year, with a range of $0.09 to $1.31 per year across NERC regions. These cost increases are too small to indicate the potential for significant direct impacts to household electricity consumers.[170]

*E. Results of the Analysis*

Overall, the analysis showed that benefits associated with improvements to water quality, wildlife, and human health resulting from reductions in pollutants in surface water and drinking water will accrue to minority and low-income populations at a higher rate under some or all of the proposed regulatory options. Remaining exposures, impacts, costs, and benefits analyzed either accrue at a higher rate to populations which are not minority or low-income, accrue proportionately to all populations, or are small enough that EPA could not conclude whether disproportionate positive or negative impacts from the options being considered would occur. While the changes in GHGs attributable to the proposed regulatory options are relatively small compared to worldwide emissions, findings from peer-reviewed evaluations demonstrate that actions that reduce GHG emissions are also likely to reduce climate impacts on vulnerable communities, including minority and low-income communities.

*F. Solicitations on Environmental Justice Analysis and Community Outreach*

EPA solicits comment on the data, analysis, and results of the EJA. EPA solicits comment on additional data or methods that could be used to further expand the EJA and better capture the potential impacts of the proposed rule. In light of the considerations EPA discussed for conventional air pollution health benefits, EPA solicits comment on whether and how the Agency could further evaluate the distributional impacts of this benefit category in a final rule analysis. EPA also solicits comment on any regulatory options not explicitly analyzed that would further benefit communities with PEJC and could be built into any final rule analyses.

EPA solicits comment on how the Agency should continue to engage with the communities from Table XIII–1 of this preamble that were included in the initial outreach. EPA asks that comments suggesting additional outreach activities, especially those that might occur during the public comment period, be provided early in the comment period to allow the Agency sufficient time to plan and execute any outreach. EPA solicits comment on whether EPA should conduct in-person or hybrid public hearings in any or all of these communities during the public comment period, in addition to the two nationwide virtual public hearings already planned. EPA solicits comment on the best means for maximizing public participation at any such meetings. EPA also solicits comment on other communities that may warrant additional outreach and engagement based on the results of the full-scale analysis or for reasons not well documented in the EJA due to site-specific information that was not readily available to the Agency.

## XIV. Development of Effluent Limitations and Standards

This section describes the statistical methodology used to calculate the long-term averages, variability factors, and proposed BAT limitations and PSES. The effluent limitations and standards are based on long-term average effluent values and variability factors that account for variation in treatment performance of the model technology. The proposed effluent limitations and/or standards, collectively referred to in the remainder of this section as ''limitations,'' for pollutants for each technology option are provided as ''daily maximums'' and ''maximums for monthly averages.'' Definitions provided in 40 CFR 122.2 state that the daily maximum limitation is the ''highest allowable 'daily discharge,' '' and the maximum for monthly average limitation is the ''highest allowable average of 'daily discharges' over a calendar month, calculated as the sum of all 'daily discharges' measured during a calendar month divided by the number of 'daily discharges' measured during that month.'' Daily discharges are defined to be the '' 'discharge of a pollutant' measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling.'' In this section, the term ''option long-term average'' and ''option variability factor'' refer to the long-term averages and variability factors for technology options for an individual wastestream rather than the regulatory options described in Section VII of this preamble.

*A. Criteria Used To Select Data as the Basis for the Limitations and Standards*

In developing effluent limitations guidelines and standards for any industry, EPA qualitatively reviews all the data before selecting data that represents proper operation of the technology that forms the basis for the limitations. EPA typically uses four criteria to assess the data.

The first criterion requires that the plants have the model treatment technology and demonstrate consistently diligent and optimal operation. Application of this criterion typically eliminates any plant with treatment other than the model technology. EPA determines whether a plant meets this criterion based upon site visits; discussions with plant management; and/or comparison to the characteristics, operation, and performance of treatment systems at other plants. EPA often contacts plants to determine whether data submitted were representative of normal operating conditions for the plant and equipment. As a result of this review, EPA typically excludes the data when the plant has not optimized the performance of its treatment system to the degree that represents the appropriate level of control (*e.g.,* BAT).

The second criterion requires that the influents and effluents from the treatment components represent typical wastewater from the industry, without incompatible wastewater from other sources. Application of this criterion results in EPA selecting plants where the commingled wastewaters did not result in substantial dilution, un-equalized slug loads resulting in frequent upsets and/or overloads, more concentrated wastewaters, or wastewaters with different types of pollutants than those generated by the wastestream for which EPA is proposing effluent limitations.

The third criterion ensures that the pollutants are present in the influent at sufficient concentrations to evaluate treatment effectiveness. To evaluate whether the data meet this criterion for inclusion as a basis of the limitations, EPA uses the long-term average test for plants where EPA possesses paired influent and effluent data (see section 13 of the 2015 TDD for details of the long-term average test). The test measures the influent concentrations to ensure a pollutant is present at a sufficient concentration to evaluate treatment effectiveness. If a data set for a pollutant fails the test (*i.e.,* pollutant

[170] EPA notes that other electricity consumers (*e.g.,* industrial consumers) could also face increased electricity prices.



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not present at a treatable concentration), EPA excludes the data for that pollutant at that plant when calculating the limitations.

The fourth criterion requires that the data are valid and appropriate for their intended use (*e.g.,* the data must be analyzed with a sufficiently sensitive method). Also, EPA does not use data associated with periods of treatment upsets because these data would not reflect the performance of well-designed and well-operated treatment systems. In applying the fourth criterion, EPA may evaluate the pollutant concentrations, analytical methods and the associated quality control/quality assurance data, flow values, mass loading, plant logs, and other available information. As part of this evaluation, EPA reviews the process or treatment conditions that may have resulted in extreme values (high and low). Because of this review, EPA may exclude data associated with certain time periods or other data outliers that reflect poor performance or analytical anomalies by an otherwise well-operated site.

EPA also applies the fourth criterion when reviewing data corresponding to the initial commissioning period for treatment systems. Most industries incur commissioning periods during the adjustment period associated with installing new treatment systems. During this acclimation and optimization process, the effluent concentration values tend to be highly variable with occasional extreme values (high and low). This occurs because the treatment system typically requires some ''tuning'' as the plant staff and equipment and chemical vendors work to determine the optimum chemical addition locations and dosages, vessel hydraulic residence times, internal treatment system recycle flows (*e.g.,* filter backwash frequency, duration and flow rate, return flows between treatment system components), and other operational conditions like clarifier sludge wasting protocols. It may also take several weeks or months for treatment system operators to gain expertise on operating the new treatment system, which also contributes to treatment system variability during the commissioning period. After this initial adjustment period, the systems should operate at steady state with relatively low variability around a long-term average over many years. Because commissioning periods typically reflect one-time operating conditions unique to the first time the treatment system begins operation, EPA generally excludes such data in developing the limitations.[171]

*B. Data Selection for Each Technology Option*

For FGD wastewater and BA transport water, the preferred regulatory option proposes zero discharge of pollutants; therefore, no effluent concentration data were used to develop the limitations for these wastestreams.[172] As described in Section VII of this preamble, EPA is proposing that permitting authorities establish limitations for discharges of pollutants in SI decant wastewater, SI dewatering wastewater, and legacy wastewater on a case-by-case basis. Thus, no effluent concentration data were used to set national effluent limitations. For the limitations on CRL based on the chemical precipitation technology option, EPA is proposing to transfer the limitations calculated based on the 2015 and 2020 rule chemical precipitation technology option for FGD wastewater because while EPA does not have effluent data for leachate from plants that employ chemical precipitation technology on CRL, EPA's record demonstrates that CRL is chemically similar to FGD wastewater and amenable to such treatment. EPA used the same approach in the 2013 proposed rule and in the final 2015 rule for NSPSs for CRL, and the Agency solicits comment on additional pilot tests or full-scale installations that could be used in lieu of, or to supplement, this approach.

*C. CRL*

EPA is proposing limitations on mercury and arsenic in leachate based on chemical precipitation. As discussed in Section VII.B.3 of this preamble, some discharges of leachate may also occur through groundwater. EPA solicits comment on whether site-specific variability in the subsurface soils, sorbents, and other characteristics could result in lowering measured concentrations of the two chosen indicator pollutants (mercury and arsenic) below the proposed CRL limitations without actually treating the full suite of pollutants that EPA proposes chemical precipitation is able to treat. Thus, for leachate discharged through groundwater, EPA solicits comment on whether the Agency should calculate daily and monthly limitations for these other pollutants in Table XIV–1.

TABLE XIV–1—OTHER POLLUTANTS TREATED BY CHEMICAL PRECIPITATION [173]

| | |
|---|---|
| Antimony | Magnesium |
| Barium | Manganese |
| Beryllium | Molybdenum |
| Cadmium | Nickel |
| Chromium | Thallium |
| Cobalt | Titanium |
| Copper | Vanadium |
| Lead | Zinc |

Should EPA elect to calculate daily and monthly limitations for the pollutants in Table XIV–1, EPA solicits comment on whether to use the same data sets and methods used to calculate limitations for arsenic and mercury that the Agency used in the 2015 rule record. Specifically, EPA solicits comment on the data set of FGD wastewater treated by chemical precipitation with regard to each of these pollutants. EPA also solicits comment on the methodology described in the 2015 and 2020 rule records, which consists of interim steps of calculating a long-term average and variability factors. EPA also solicits comment on data where leachate was treated in a pilot or full-scale chemical precipitation system that could be used in the calculation of such limitations either in lieu of, or in addition to, the data discussed above.

## XV. Regulatory Implementation

*A. Continued Implementation of Existing Limitations and Standards*

EPA has continually stressed, since the announcement of this supplemental rulemaking, that the 2015 and 2020 limitations (or lack thereof) continue to apply.[174] In the sections below, EPA discusses considerations for permitting authorities and regulated entities as they continue to implement existing

[171] Examples of conditions that are typically unique to the initial commissioning period include operator unfamiliarity or inexperience with the system and how to optimize its performance; wastewater flow rates that differ significantly from engineering design, altering hydraulic residence times, chemical contact times, and/or clarifier overflow rates, and potentially causing large changes in planned chemical dosage rates or the need to substitute alternative chemical additives; equipment malfunctions; fluctuating wastewater flow rates or other dynamic conditions (*i.e.,* not steady state operation); and initial purging of contaminants associated with installing the treatment system, such as initial leaching from coatings, adhesives, and susceptible metal components. These conditions differ from those associated with the restart of an already commissioned treatment system, like that which may occur from a treatment system that has undergone either short or extended duration shutdown.

[172] This is also true for some of the technologies EPA solicits comment on for CRL, SI decant wastewater, SI dewatering wastewater, and legacy wastewater.

[173] The pollutants treated by chemical precipitation are discussed in Section 8 of the TDD.

[174] 86 FR 41801 (August 3, 2021).



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regulations and look ahead to the regulations in this proposal.

1. Reaffirmation of Expectation That Requirement That FGD and BA Transport Water BAT Limitations Apply ''as Soon as Possible'' Requires Careful Consideration of the Soonest Date That the Discharger Can Meet the Limitations

EPA reaffirms that permitting authorities must continue to write permits that include the current 2015 and 2020 rule BAT limitations, whether as part of permit renewals or permit modifications. Similarly, permittees must meet applicable permit limitations as soon as possible. EPA stresses that the Agency did not issue a postponement rule for the 2020 rule FGD wastewater and BA transport water BAT limitations as it did in 2017 for the 2015 rule. The 2017 rule postponed the earliest compliance dates of the 2015 rule for FGD wastewater and BA transport water to November 2020 to ''preserve the status quo for FGD wastewater and bottom ash transport water until EPA completes its next rulemaking.'' [175] This made sense at the time because EPA had received new information in petitions suggesting that the 2015 rule limitations could not be met with the 2015 BAT technology basis.[176] In contrast, EPA's 2020 rulemaking generally reaffirmed, and provided further flexibilities for, the technology bases established in the 2015 rule. There is no basis in the record indicating that the limitations finalized in 2020 are not available or economically achievable, and thus there is no reason for EPA to postpone their implementation. Instead, EPA focused on progress toward eliminating discharges, consistent with CWA section 301(b)(2)(A). Thus, EPA's announcement of this supplemental rulemaking stated that ''the pollutant reductions accomplished by the existing Rules will occur while the Agency engages in rulemaking to consider more stringent requirements'' (86 FR at 41802, August 3, 2021). This is consistent with the CWA's structure of progressively more stringent limitations pushing technological advances over time.

Since EPA did not postpone the earliest compliance dates, permitting authorities should not establish an ''as soon as possible'' date that is anything other than as soon as possible for the selected technology. For example, where an applicant provides site-relevant information on its biological treatment system that demonstrates it can meet limitations by 2023, it would not be appropriate for the applicant to request an ''as soon as possible'' date that is later by using as an ''other factor'' the fact that EPA is currently undergoing a supplemental rulemaking. This would serve to further postpone compliance with limitations intended to reflect technological advances since promulgation of steam electric ELGS in 1982. EPA also notes that the Agency is soliciting comment in the sections above on alternative flexibilities such as alternative formulations of an early adopter subcategory, one of which may include plants that have already contracted for, but not yet installed, biological treatment. Though EPA solicits comment on various potential permutations of any final rule, the Agency is not changing or postponing the existing 2020 rule. Thus, anything but steadfast implementation of the current 2020 rule limitations at this time is not warranted.

In some cases, however, a facility may not yet have contracted for a specific technology and may be considering alternatives. In such circumstances, a permitting authority may consider the timeframes of more advanced technologies when determining the ''as soon as possible'' date. For example, if a permit applicant submitted timeframes for both a ZVI system that could be operational in 2024 and an alternative consisting of plant modifications to recycle wastewater and operate zero discharge by 2025, it would be reasonable for the permitting authority to set an ''as soon as possible'' date for the facility to eliminate its discharge in 2025.[177]

Similar parallels can be seen with BA transport water. Limitations based on a high recycle rate system should still be included in a permit with a date that is ''as soon as possible'' to meet the site-specific purge limitation. If a facility has not yet contracted for a technology and is deciding between a dry handling system (*e.g.,* pneumatic) and a high recycle rate system, it would be reasonable for the permitting authority to consider the longer timeframe necessary for the dry handling system.

2. Reaffirmation That CRL and Legacy Wastewater BAT Limitations Require a Site-Specific BPJ Analysis and Careful Consideration of Technologies Beyond Surface Impoundments

Under current law, permitting authorities must continue to conduct BPJ analyses and establish TBELs pursuant to 40 CFR 125.3(c)(2) and (3) for BA purge water, CRL,[178] and legacy wastewater unless and until EPA promulgates nationwide BAT. In conducting these analyses, EPA has discussed several technologies in the 2015, 2020, and current proposed rule TDDs and preambles that permitting authorities may consider or select as the basis for TBELs. Where these technologies are included in a BPJ analysis, they must be evaluated by the permitting authority pursuant to the factors set forth in section 125.3(d)(3).[179] Furthermore, as EPA notes in the discussion of FGD wastewater above, there may be multiple, separate legacy wastewaters at a single plant. Thus, in some cases, permitting authorities may have to decide whether these wastewaters should receive separate limitations.[180] Due to the ongoing rulemaking, EPA also recommends, but is not requiring, that permits issued or modified between this proposal and any final rule contain a reopener clause in accordance with 40 CFR 122.62(a)(7) and 124.5.

3. Consideration of Late Notice of Planned Participation

In Section VII of this preamble above, EPA discussed the proposed retention of the subcategory for EGUs permanently ceasing coal combustion by 2028. EPA also solicited comment on extending the period for filing a NOPP for this subcategory. EPA also solicits comment on whether this extended period should be available to LUEGUs and high FGD flow plants. Any final rule would not be promulgated until 2024. Therefore, the effect of removing these subcategories in a final rule would be that the three impacted plants of which EPA is aware

[175] U.S. EPA (Environmental Protection Agency). 2017. *Fact Sheet: Postponement of Certain Compliance Dates for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Industry*. EPA 823–S–17–001. September. Available online at: *www.epa.gov/sites/default/files/2017-09/documents/steam-electric-elg_final_postpone-compliance-dates_fact-sheet_sept-2017.pdf*.

[176] EPA notes that upon review in the 2020 rule record, these suggestions were found to be without merit.

[177] Note that a decision between biological vendors or between a biological and ZVI vendor with essentially the same performance would not warrant a later date just because one vendor cannot complete its system until a later date.

[178] For CRL discharged via groundwater, EPA notes that this is a technology-based CWA requirement—a separate and distinct requirement from any CCR rule corrective action requirements which may apply.

[179] Consistent with section 304(b)(2)(B) of the CWA, these consist of: (i) The age of equipment and facilities involved; (ii) The process employed; (iii) The engineering aspects of the application of various types of control techniques; (iv) Process changes; (v) The cost of achieving such effluent reduction; and (vi) Non-water quality environmental impact (including energy requirements).

[180] Furthermore, permitting authorities could determine that more stringent water quality-based effluent limitations are needed to achieve water quality standards.



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would still be required to meet any permitted subcategory limitations presently, and in the next permit renewal these plants would be required to meet the zero-discharge limitations for FGD wastewater in this proposal. Given the five-year permit cycle and assuming implementation through permitting immediately after promulgation of the final rule in 2024, the ''no later than'' date would be December 31, 2029. Thus, under the flexibility of the permitting authority to consider ''other factors'' under section 423.11(t), these plants could, subject to permitting authority discretion, effectively have one additional year to discharge under the current, less stringent limitations than plants in the existing subcategory for EGUs permanently ceasing coal combustion by 2028. EPA solicits comment on the reasonableness of this possible result, including whether these plants should be required to file a NOPP for limitations under the subcategory for EGUs permanently ceasing coal combustion by 2028, should they elect to retire.

*B. Implementation of New Limitations and Standards*

The limitations and standards in this proposed rule would apply to discharges from steam electric power plants through incorporation into NPDES permits issued by EPA and authorized states under CWA section 402, and through pretreatment programs under CWA section 307. NPDES permits or control mechanisms issued after a final rule's effective date must incorporate the ELGs, as applicable. Where permits with the 2015 and/or 2020 rule limitations have already been issued, EPA expects that any final rule requirements would be incorporated in the next permit. Also, under CWA section 510, states can require effluent limitations under state law as long as they are no less stringent than the requirements of any final rule. Finally, in addition to requiring application of the technology-based ELGs in any final rule, CWA section 301(b)(1)(C) requires the permitting authority to impose more stringent effluent limitations, as necessary, to meet applicable water quality standards.

1. Availability Timing of Proposed Requirements

The direct discharge limitations in this rule apply only when implemented in an NPDES permit issued to a discharger. Under the CWA, the permitting authority must incorporate these ELGs into NPDES permits as a minimum level of control. The proposed rule provides the plant's permitting authority with discretion to determine the date when the new effluent limitations for FGD wastewater and BA transport water would apply to a given discharger. EPA proposes that the earliest date these new limitations could apply to a discharger is the effective date of any final rule. Except for the limitations in certain subcategories, for any finalized effluent limitation that is specified to become applicable after the effective date, the specified date must be as soon as possible after that date, but in no case later than December 31, 2029. For dischargers subject to less stringent limitations based on certifications that they qualify for a subcategory based on permanent cessation of coal combustion, however, EPA proposes to require permitting authorities to put the more stringent zero-discharge limitations for FGD wastewater and BA transport water in the existing permit effective the day after the date of closure. This way, EPA would ensure that dischargers would not benefit from less stringent limitations based on closure by a certain date if that closure does not occur. This proposal would not impact dischargers choosing to meet the 2020 VIP effluent limitations for FGD wastewater; the date for meeting those limitations is December 31, 2028.

Pretreatment standards, unlike effluent limitations, are directly enforceable and must specify a time for compliance not to exceed three years from the date of promulgation under CWA section 307(b)(1). Under EPA's General Pretreatment Regulations for Existing and New Sources, POTWs with flows in excess of five MGD must develop pretreatment programs meeting prescribed conditions. These POTWs have the legal authority to require compliance with applicable pretreatment standards and control the introduction of pollutants to the POTW through permits, orders, or similar means. POTWs with approved pretreatment programs act as the control authorities for their industrial users. Among the responsibilities of the control authority are the development of the specific discharge limitations for the POTW's industrial users. Because pollutant discharge limitations in categorical pretreatment standards may be expressed as concentrations or mass limitations, in many cases, the control authority must convert the pretreatment standards to limitations applicable to a specific industrial user and then include these in POTW permits or another control instrument.

Regardless of when a plant's NPDES permit is ready for renewal, EPA recommends that each plant immediately begin evaluating how it intends to comply with the requirements of any potential final rule. In cases where significant changes in operation are appropriate, EPA recommends that the plant discuss such changes with its permitting authority and evaluate appropriate steps and a timeline for the changes as soon as any final rule is promulgated, even before the permit renewal process.

The ''as soon as possible'' date is the effective date of any final rule, unless the permitting authority determines another date after receiving relevant information submitted by the discharger.[181] The proposed rule would not revise the specified factors permitting authorities must consider in determining the as soon as possible date under the 2015 and 2020 rules. Based on receiving relevant information from the discharger, the NPDES permitting authority may determine a different date is ''as soon as possible'' within the implementation period, using the factors below:

(1) Time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of the final rule.

(2) Changes being made or planned at the plant in response to GHG regulations for new or existing fossil fuel-fired plants under the CAA, as well as regulations for the disposal of coal combustion residuals under subtitle D of the RCRA.

(3) For FGD wastewater requirements only, an initial commissioning period to optimize the installed equipment.

(4) Other factors as appropriate.

The ''as soon as possible'' date determined by the permitting authority may or may not be different for each wastestream. The NPDES permitting authority should provide a well-documented justification of how it determined the ''as soon as possible'' date in the fact sheet or administrative record for the permit. If the permitting authority determines a date later than the effective date of any final rule, the justification should explain why allowing additional time to meet any final limitations is appropriate, and why the discharger cannot meet the effluent limitations as of the effective date. Finally, while the Agency is proposing a ''no later than'' date of December 31, 2029, EPA solicits comment on earlier

[181] Information in the record indicates that most facilities should be able to complete all steps to implement changes needed to comply with proposed BA transport water requirements within 32–35 months, the FGD wastewater requirements within 28 months, and the CRL requirements within 22 months (DCN SE08480).



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or later ''no later than'' dates such as five years from the effective date of the rule or a date that would harmonize with air regulations currently being developed for this same industry.

2. Conforming Changes for Transfers in Sections 423.13(o) and 423.19(i)

EPA is proposing to remove the LUEGU subcategory as discussed in Section VII.C of this preamble above. For consistency, EPA is proposing to remove the portions of section 423.13(o) that refer to this subcategory. This includes removal of paragraph (o)(1)(i), removal of paragraphs (o)(1)(ii)(C)–(E), and a renumbering of the remaining paragraphs. EPA is also revising paragraph (o)(3) as it would now apply to all remaining transfers. EPA is proposing to revise the reporting and recordkeeping requirements of section 423.19(i) to reflect the remaining transfer provisions. EPA solicits comment on whether any additional conforming changes are necessary for the transfer provisions of section 423.13(o).

3. Conforming Changes for Voluntary and Involuntary Delays in Sections 423.18(a) and 423.19(j)

EPA is proposing to remove the LUEGU subcategory and add an early adopter subcategory, as discussed in Section VII.C of this preamble above. For consistency, EPA is proposing to remove reference to LUEGUs and add a reference to early adopter EGUs in the permit conditions of section 423.18(a). EPA is also proposing conforming changes to the reporting and recordkeeping requirements in section 423.19(i). Specifically, EPA is proposing to add reference to the filings for material delays associated with the early adopter subcategory and associated 2032 permanent cessation of coal combustion date. EPA solicits comment on whether any additional conforming changes are necessary for the permit conditions or reporting and recordkeeping provisions to document these voluntary and involuntary delays.

EPA also wishes to clarify the applicability of section 423.18(a) with respect to TVA. TVA is not subject to regulation or oversight by either a public utility commission or an independent system operator but rather serves those functions for itself in its service territory. In addition, as of May 31, 2007, TVA was certified by NERC as the reliability coordinator for itself, as well as for TVA Reliability Coordinator Members.[182] As the NERC-certified reliability coordinator, TVA has the authority to issue operating instructions and emergency operating instructions with which the TVA Reliability Coordinator Members must comply. It is in every respect a competent electricity regulator. The current regulations broadly refer to ''a competent electricity regulator (*e.g.,* an independent system operator)'' and therefore would reasonably include unique situations such as that of TVA. Nevertheless, EPA solicits comment on whether this unique situation should explicitly be included in the regulatory text.

4. Recommended Information To Be Submitted With a Permit Application for a Potential Discharge of CRL Through Groundwater

The question of whether facilities in this sector require a permit for any wastewater that travels through groundwater is a long-standing one. The Supreme Court recently clarified that discharges of pollutants through groundwater to WOTUS are subject to the NPDES permit program if they are the functional equivalent of a direct discharge. *See County of Maui* v. *Hawaii Wildlife Fund,* 140 S. Ct. 1462 (2020). The record indicates that it is currently uncommon for CRL discharges through groundwater to be controlled in NPDES permits. Thus, EPA is recommending that all facilities with CCR landfills or surface impoundments evaluate whether there are any such discharges that are subject to the NPDES permit program. For any such discharges that are not currently authorized by an NPDES permit, EPA strongly recommends that the permittee expeditiously seek permit coverage. CWA section 301(a) explains that, except as in compliance with certain provisions of the act, ''. . . the discharge of any pollutant by any person shall be unlawful.'' The process to obtain NPDES permit authorization for any discharges typically begins when a permittee submits a permit application to seek permit coverage for discharge(s).

To help permitting authorities decide whether to issue a permit authorizing such discharges, EPA recommends that the permittees submit a permit application with sufficient information to inform that decision. NPDES regulations at 40 CFR 122.21(e) prohibit permitting authorities from issuing an individual permit until and unless a prospective discharger provides a complete application. Section 122.21(e)(1) states, ''an application for a permit is complete when the Director receives an application form and any supplemental information which are completed to his or her satisfaction.'' Absent EPA or state permit application forms specific to discharges through groundwater, EPA recommends that permit applicants with potential CRL discharges through groundwater subject to 40 CFR part 423 submit a permit application using the existing form(s) the permitting authority requires for industrial facilities, along with any supplemental information that would assist the permitting authority, including any of the information described below.

EPA recommends that permitting authorities also meet with applicants early in the process to understand what supplemental information they may need. The itemized elements of general and technical information described below are provided for consideration; the permitting authority may determine it needs this information, only a subset of this information, or other information. Providing the supplemental information that the permitting authority deems appropriate will help expedite the permitting authority's review of the permit application and potential permit issuance. As discussed in the *NPDES Permit Writer's Manual:*[183]

> ''[A]fter the initial application review, the permit writer may request that an applicant submit other information needed to decide whether to issue a permit and for permit development. The requested information could include the following: additional information, quantitative data . . .''

Supplemental information also can be obtained later when the permit writer is drafting the permit. The applicant may submit additional information voluntarily or be required to do so under CWA section 308 or a similar provision of state law. This process can be time consuming and intensive, as described in the *Permit Writer's Manual:* ''in some situations, a considerable amount of correspondence might be required before the permit writer obtains all the information that he or she believes is necessary to draft the permit.'' For permittees that request NPDES permit authorization for discharges of CRL through groundwater, EPA recommends that the permittee provide the information described below as soon as possible to the permitting authority. This information is unique to the steam electric industrial

[182] These members consist of Memphis Light, Gas, and Water (MLGW), Associated Electric Cooperative, Inc. (AECI), Louisville Gas & Electric and Kentucky Utilities (LG&E/KU), Owensboro Municipal Authority, and Smoky Mountain Transmission.

[183] Available online at: *www.epa.gov/npdes/npdes-permit-writers-manual.*



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sector and may not be warranted for other industrial sectors at this time. This sector contains hundreds of large, unlined landfills and surface impoundments that are within a mile of a surface waterbody (and often substantially closer). Furthermore, EPA believes much of the supplemental data and information described below (and that would be part of the permit application) is already required and made publicly available under the CCR rule. Thus, the incremental burden to facilities should be minimal, especially when compared to the potential burden of the permitting authorities seeking out and compiling this same information.

- *EPA Recommended General Information.* General information helps the permitting authority identify the major site features and monitoring capabilities of the facility. The general information could include:

(1) Facility name and owner(s).

(2) The identification number of the most recent final national pollution discharge elimination permit, if any, and the date of issuance.

(3) A table listing all coal-fired EGUs, if any, or a statement that all EGUs have permanently ceased combustion of coal. The table shall also include the name or identifier, commission year, and nameplate capacity of each such EGU.

(4) A table listing all landfills and surface impoundments subject to 257.50 *et seq.* For each such landfill or surface impoundment, the table should also include the name or identifier, commission year, acreage, the liner status consistent with the definitions of sections 257.70–257.72, types of solid wastes present, quantity of waste present, and a statement that the landfill or surface impoundment is either active or has ceased receipt of waste, listing the date it ceased receipt of waste.

(5) A table listing all groundwater monitoring wells. For each such well, the table should also include the name or identifier, commission year, location information, screen depths, and type of geologic material in which the well was screened (*e.g.,* sand, silt, clay).

(6) A table listing all surface waterbodies located within one mile of any landfill or surface impoundment from the table in #4 above, if any, or the closest such waterbody if none are located within one mile. The table should also include the hydraulic unit code and the shortest measurable distance from any edge of the nearest landfill or surface impoundment to any edge of the waterbody. This shortest distance should be measured and reported at an average water level, maximum water level (*e.g.,* flood conditions), and minimum water level.

(7) A map with a legend depicting the location and boundaries of all items listed in the above information, including labels identifying such items.

- *EPA Recommended Technical Information.* Technical information on groundwater and subsurface data provides permitting authorities a compiled set of information to evaluate the seven factors identified in *Maui.* EPA notes that permitting authorities may request any other information or data as appropriate. Technical information could include:

(1) For each aquifer underlying the landfills and surface impoundments identified in the general information above, a time series of groundwater elevations as measured in the groundwater monitoring wells covering either 2015 through the present, or the groundwater monitoring well commission year through the present, whichever is shorter.

(2) For each surface water identified in the general information above, a time series of surface water elevations covering the same date range of as in #1.

(3) For each landfill or surface impoundment from the general information above, the elevation of the waste bottom. For each surface impoundment, the operating level and freeboard shall also be included.

(4) A graph plotting the elevations in #1–3 over time.

(5) Measured, calculated, or estimated values of the site hydraulic conductivity, hydraulic gradient, velocity of groundwater, and effective porosity, giving particular consideration to these along the trajectory of groundwater flow from the landfill or surface impoundment to the surface waterbody.

(6) Estimated groundwater travel time from each landfill or surface impoundment into each surface waterbody in the general information. In addition to average estimates, minimum and maximum travel times should be estimated.

(7) A groundwater potentiometric surface map of the facility illustrating the average travel times estimated in #6. To the extent possible, such a map should be created with data collected during the same sampling round.

(8) Summary statistics including the minimum, maximum, and average of the data and estimates in #1, 2, and 6.

(9) Using all available data, summary statistics (including minimum, maximum, and average) of the concentration of each pollutant in the table following this section for each groundwater monitoring well supported by appendix tables containing all groundwater monitoring data. Where no data exist for any pollutant in this table, there should be a certification for each such pollutant that no groundwater monitoring data exist. Erroneous data (*e.g.,* due to lab error) may be excluded with a narrative explaining the exclusions.

(10) Three isoconcentration plots showing the horizontal extent of the most dispersed pollutant reported in #9 using the minimum, maximum, and average values from each well. These plots should be supported by an appendix containing isoconcentration plots showing the horizontal extent of all remaining pollutants reported in #9 in the same manner.

(11) Three isoconcentration plots showing the vertical extent of the most dispersed pollutant reported in #9 using the minimum, maximum, and average values. These plots should be supported by appendix isoconcentration plots showing the vertical extent of all remaining pollutants reported in #9 in the same manner.

(12) Boring logs, geotechnical laboratory reports, and sieve analyses from the initial safety factor assessment, if any, other site-specific data and evaluations of the subsurface, and supplemental geologic subsurface data from regional databases where necessary.

(13) A list of sorbents for the pollutants listed in the table following this section, a list of which pollutants are known to sorb to each, and a discussion of which sorbents are present in the subsurface that contaminated groundwater would pass through to the surface waterbodies listed in the general information. If available, include laboratory measurements of contaminated uppermost aquifer material.

(14) The estimated cross-sectional surface area through which CRL enters each surface waterbody listed in the table in the general information.

(15) For each pollutant listed in the table following this section, a minimum, maximum, and average estimate of the mass flux from each landfill or surface impoundment and into each surface waterbody in the general information, the mass sorbed in the subsurface, and the mass dissolved in the groundwater.

BAT/PSES Treated Pollutants in CRL

| | |
|---|---|
| Antimony | Magnesium |
| Arsenic | Manganese |
| Barium | Mercury |
| Beryllium | Molybdenum |
| Cadmium | Nickel |
| Chromium | Thallium |
| Cobalt | Titanium |



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BAT/PSES TREATED POLLUTANTS IN CRL—Continued

| | |
|---|---|
| Copper | Vanadium |
| Lead | Zinc |

EPA solicits comment on every aspect of these recommendations. While administrative burden to permitting agencies may initially increase, given the *Maui* decision and the high visibility of the data collected under the CCR rule, EPA anticipates that some of these facilities may need permit coverage in the future. EPA's intent is to assist permitting agencies by clarifying some of the supplemental data that would be useful for determining the presence and nature of a discharge of CRL through groundwater. EPA solicits comment on the extent to which this recommended information would reduce the existing burden to permitting authorities post-*Maui* and on alternatives that might further reduce this burden.

EPA also solicits comment on three alternative approaches for obtaining this information. First, EPA solicits comment on directly obtaining this information through a series of CWA 308(a) information request letters to all plants subject to 40 CFR part 423. Second, EPA solicits comment on placing the recommendations above directly in a regulation that would require provision of this information under CWA 308 authority. Third, EPA solicits comment on adding a requirement to the permit application regulations of part 122 that a facility must provide this information to the permitting authority as part of the permit application process. Under all these alternatives, EPA solicits comment on whether and how this information could be made publicly available to increase transparency.

*C. Reporting and Recordkeeping Requirements*

EPA is proposing several new reporting and recordkeeping requirements or changes and soliciting comment on others. First, to implement the proposed rule's removal of two subcategories and addition of an early adopter subcategory, under CWA sections 304(i) and 308, this proposal includes four proposed changes to the individual reporting and recordkeeping requirements of section 423.19. In particular, EPA is proposing to add an additional component to the annual progress reports under the subcategory for EGUs permanently ceasing coal combustion. As with the reporting and recordkeeping requirements of the 2020 rule, for the early adopter subcategory, EPA is proposing to balance the additional flexibilities for certifying to the subcategory at a later date with additional reporting and recordkeeping to provide extra certainty that plants still intend to avail themselves of those provisions. Moreover, EPA is proposing to add reporting and recordkeeping requirements to facilitate evaluation of CRL discharges through groundwater. EPA is also proposing to make conforming changes that would remove reporting and recordkeeping requirements applying to LUEGUs.

Second, to increase transparency for impacted communities, EPA is proposing to require all steam electric plants subject to the reporting and recordkeeping requirements of 423.19(d)–(k) to post this reporting and recordkeeping information to a public-facing website.[184]

Finally, EPA is soliciting comment on a potential reporting requirement intended to enhance flexibility for the transition to zero-discharge limitations for FGD wastewater and BA transport water.

1. Summary of Proposed Changes to the Annual Progress Reports for EGUs Permanently Ceasing Coal Combustion by 2028

EPA proposes to modify the annual progress reports for the subcategory of EGUs permanently ceasing coal combustion by 2028. Specifically, EPA proposes adding a requirement that the annual progress reports include either the official filing to the facility's reliability authority or a certification providing an estimate of when such a filing will be made. Furthermore, EPA is proposing that the final annual progress report prior to permanent cessation of coal combustion must include the official filing. While facilities may already include these filings in the NOPP or annual progress reports, these filings were not explicitly required in the 2020 rule and provide the strongest assurance that a facility will not voluntarily change its plans and continue operations beyond 2028. EPA solicits comment on whether this or additional requirements would further support the operation of the subcategory without unduly burdening regulated facilities.

2. Summary of the Proposed Reporting and Recordkeeping Requirements for Early Adopters

EPA is proposing new reporting and recordkeeping requirements for early adopters, including an initial NOPP and annual progress reports. EPA is proposing that the initial NOPP contain three items. First, EPA is proposing the NOPP include a statement that the facility discharged FGD wastewater after the effective date of the 2020 rule (85 FR 64650, October 13, 2020). Second, EPA is proposing the NOPP include a demonstration that the facility already complies with the limitations for FGD wastewater and BA transport water in the 2020 rule by March 29, 2023. Third, EPA is proposing the NOPP include information, with milestones, about plans for the permanent cessation of coal combustion by 2032 from the relevant EGUs. EPA is proposing the first two reporting requirements to ensure that early adopters relied on EPA's rules when incurring the costs to comply with existing regulations and subsequently did comply with these regulations. Specifically, EPA is proposing that this information include diagrams and descriptions of the relevant treatment chains, commission dates, and monitoring data demonstrating compliance. EPA is proposing the latter requirement to ensure that facility have a firm commitment to permanently cease coal combustion by 2032. For this requirement, EPA is proposing to require the same information and milestones as were required for the permanent cessation of coal combustion subcategory by 2028 in the 2020 rule. Finally, EPA is proposing that, as with the permanent cessation of coal combustion subcategory in the 2020 rule (and consistent with the proposed modification above), the early adopter subcategory also include annual progress reports on completion of milestones, upcoming milestones, and including certifications and official filings made to the reliability authority. Thus, EPA proposes the same language for consistency.

3. Summary of Proposed Reporting and Recordkeeping Requirements for CRL Discharges Through Groundwater

As discussed in Section VII of this preamble above, EPA is proposing BAT limitations and PSES for CRL. EPA further discusses in that section and in the implementation section above that CRL can be discharged not only through end-of-pipe discharges, but also through groundwater. EPA is proposing to include annual reporting and recordkeeping requirements to facilitate the permitting authorities' review of CRL discharges through groundwater to surface waters that are subject to NPDES permits. It would also facilitate compliance monitoring and make compliance information available to the public.

[184] EPA is seeking to adopt provisions for the websites consistent with those of the CCR rule.



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EPA is proposing that facilities with discharges of CRL through groundwater file an Annual Combustion Residual Leachate Monitoring Report with the permitting authority, or control authority in the case of indirect dischargers, annually. This annual reporting requirement would be implemented via NPDES permits that authorize discharges of CRL through groundwater or directly where an indirect discharger eliminates the discharge through groundwater and subsequently discharges the treated CRL to a POTW. EPA is proposing that this report provide a comprehensive set of monitoring data. EPA is proposing this requirement to facilitate permitting and control authorities' ability to determine compliance with CRL limitations and to increase transparency to local communities. Thus, in addition to the data provided under 40 CFR part 127, where a CRL discharge occurs through groundwater, EPA is proposing to require groundwater monitoring data on the CRL leaving each landfill and surface impoundment and where it enters surface waterbodies. To increase transparency to local communities, EPA is proposing to require the report to include monitoring data on all the pollutants treated by chemical precipitation, rather than just mercury and arsenic. EPA solicits comment on this approach.

EPA solicits comment on all aspects of the proposed CRL monitoring report including the scope, types of information to be included, and the timeframes for submitting these reports to the permitting authority. EPA also solicits comment on whether there are additional pieces of information that would increase transparency or that the public or permitting authorities would find helpful. For example, one comment in a community meeting suggested that EPA require some limited independent monitoring and reporting to increase local community members' trust in any results presented. EPA also solicits comment on whether alternatives with a lower burden should be available in certain circumstances.

4. Proposed Deletion of Reporting and Recordkeeping Requirements for LUEGUs

EPA is proposing to remove the reporting and recordkeeping requirements for LUEGUs in current section 423.19(c) and for the associated BMP plans in current section 423.19(d), since EPA is proposing to eliminate this subcategory, as described in Section VII of this preamble above.

5. Proposed Requirement To Post Information to a Publicly Available Website

The reporting and recordkeeping requirements of the CCR rule included a novel approach for posting information to a publicly available website. This was initially done because at the time the CCR rule was signed, EPA did not have enforcement authority over the CCR rule. Thus, given the self-implementing nature of the regulations, EPA sought to make information more readily available to states and the public who could enforce the CCR rule through citizen suits.[185]

In contrast to the CCR rule, ELGs are implemented largely through authorized state permitting programs with EPA oversight. Nevertheless, one message that EPA received in initial outreach to communities was that there was a lack of trust of utilities (and in some cases, the states that regulate them). Another message was that there was an interest in more accessible information. Given the success CCR websites have achieved in disseminating information to a variety of stakeholders, EPA proposes a comparable posting requirement for the ELG. Specifically, EPA proposes that all reporting and recordkeeping information not only be retained by the regulated entity and provided to the permitting authority, but that it also be posted to a public website for 10 years, or the length of the permit plus five years, whichever is longer. EPA solicits comment on this timeframe. Furthermore, EPA's proposal would include NOPPs and other filings that have occurred since the 2020 rule. These new requirements are detailed in proposed regulatory text for section 423.19(c), and EPA solicits comment on the appropriateness of this approach, as well as any modifications to the approach that could improve transparency. EPA also proposes to allow this posting on existing CCR compliance websites to reduce paperwork burden and make it easier for communities to access. The Agency solicits comment on other ways such postings could be done while minimizing burdens.

6. Additional Solicitation on Providing a More Flexible Transition to Zero Discharge

EPA solicits comment on creation of a temporary reporting requirement, which would be in place prior to the facility meeting a zero-discharge limitation. Under such an approach, a plant would not include an optimization period in the calculation of its ''as soon as possible'' date. Rather, the plant would monitor and report any necessary discharges over the first year of attempted zero discharge while the system was being optimized and these discharges would not be a violation of the zero-discharge requirements. For subsequent years, such a flexibility would be discontinued.

*D. Site-Specific Water Quality-Based Effluent Limitations*

EPA regulations at 40 CFR 122.44(d)(1), implementing section 301(b)(1)(C) of the CWA require each NPDES permit to include any requirements, in addition to or more stringent than ELGs or standards promulgated pursuant to sections 301, 304, 306, 307, 318, and 405 of the CWA, necessary to achieve water quality standards established under section 303 of the CWA, including state narrative criteria for water quality. Those same regulations require that limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) that the Director determines are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality (40 CFR 122.44(d)(1)(i)).

The preamble to the 2015 rule discussed bromide as a parameter for which water quality-based effluent limitations may be appropriate. EPA stated its recommendation that permitting authorities carefully consider whether water quality-based effluent limitations for bromide or TDS would be appropriate for FGD wastewater discharged from steam electric power plants upstream of drinking water intakes. EPA also stated its recommendation that the permitting authority notify any downstream drinking water treatment plants of the discharge of bromide.

While the 2020 rule did not include limitations on bromide for FGD wastewater or BA transport water (beyond the removals that would be required of plants choosing to meet the VIP limitations), the current proposal would require zero discharge of FGD wastewater and BA transport water for most plants. Nevertheless, EPA is proposing subcategories for these wastewaters, and new data submitted to EPA on CRL show measurable levels of

[185] While the Water Infrastructure Improvements for the Nation Act later provided EPA with permitting and oversight authority, the CCR rule continues to require posting to publicly available websites.



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bromide.[186] Therefore, the records for the 2015 rule, the 2020 rule, and this proposal continue to suggest that permitting authorities should consider establishing water quality-based effluent limitations where necessary to meet applicable water quality standards to protect of populations served by downstream drinking water treatment plants.

In consultations conducted with state and local government entities, EPA received comments from the American Water Works Association (AWWA) and the Association of Metropolitan Water Agencies. These comments requested that EPA consider technologies that could treat upstream pollutants at the point of discharge, but also suggested that EPA empower states to address the issue as well. The latter discussion referenced the approaches discussed in *Methods to Assess Anthropogenic Bromide Loads from Coal-Fired Power Plants and Their Potential Effect on Downstream Drinking Water Utilities.*[187] This document, provided in comments during the 2020 rulemaking and again during consultations on the current rulemaking, describes methodologies, data sources, and considerations for constructing an approach to bromide issues on a site-specific basis. This document presents additional data sources that NPDES permitting authorities could use to establish site-specific, water quality-based effluent limitations (*see, e.g.,* figure 29 in AWWA's document). The document also provides examples of where states have already taken similar action. For example, AWWA cites California's 0.05 mg/L standard for in-river bromide to protect public health for specific waterways and drinking water treatment systems.

In addition to considering water quality-based effluent limitations for parameters present in the wastestreams in this proposal, EPA also calls attention to the need to address potential for per- and polyfluoroalkyl substance (PFAS) discharges. In EPA's *PFAS Strategic Roadmap,*[188] the Agency laid out actions that would prevent PFAS from entering the environment. Specifically, EPA stated it would ''proactively use existing NPDES authorities to reduce discharges of PFAS at the source and obtain more comprehensive information through monitoring on the sources of PFAS and quantity of PFAS discharged by these sources.'' EPA has already drafted a memorandum covering facilities where EPA is the permitting authority,[189] as well as guidance to state permitting authorities to address PFAS in NPDES permits.[190] While the steam electric power sector was not identified as one of the top PFAS dischargers, EPA notes that PFAS may nevertheless be present in steam electric discharges. For example, the Wisconsin Department of Natural Resources has found PFAS at eight power plants.[191] In addition, firefighting foam used in exercises or actual fires at steam electric plants could contain PFAS. Therefore, permitting or control authorities may appropriately consider whether PFAS monitoring and any further restrictions (*e.g.,* BMPs) would be appropriate at a given facility.

## XVI. Related Acts of Congress, E.O.s, and Agency Initiatives

Additional information about these statutes and E.O.s can be found at *www.epa.gov/laws-regulations/laws-and-executive-orders.*

### *A. E.O.s 12866 (Regulatory Planning and Review) and 13563 (Improving Regulation and Regulatory Review)*

This proposed rule was submitted to the OMB for review as significant under Section 3(f)(1) of Executive Order 12866. Any changes made in response to OMB recommendations have been documented in the docket. EPA prepared an analysis of the potential social costs and benefits associated with this action. This analysis is contained in Chapter 12 of the BCA and is available in the docket.

### *B. Paperwork Reduction Act*

EPA has submitted the information collection activities in this proposed rule to the OMB for approval under the Paperwork Reduction Act. The Information Collection Request (ICR) document EPA prepared has been assigned EPA ICR number 2752.01 and OMB Control Number 2040–NEW. A copy of the ICR is available in the docket for this rule and is briefly summarized here.

As described in Section XV.C of this preamble, EPA is proposing several changes to the individual reporting and recordkeeping requirements of section 423.19 for specific subcategories of plants and/or plants that have certain types of discharges. EPA is proposing to add reporting and recordkeeping requirements to plants in the early adopter subcategory and plants that discharge CRL through groundwater, and to remove reporting and recordkeeping requirements for LUEGUs. EPA is also proposing a new requirement for plants to post reports to a publicly available website.

Respondents/affected entities: The respondents affected by this ICR are steam electric power plants. The North American Industry Classification System (NAICS) identification number applicable to respondents is 221112: Electric Power Generation Plants—Fossil Fuel Electric Power Generation. The U.S. Census Bureau describes this U.S. industry as establishments primarily engaged in operating fossil fuel powered electric power generation facilities. These facilities use fossil fuels, such as coal, oil, or gas, in internal combustion or combustion turbine conventional steam process to produce electric energy. The electric energy produced in these establishments is provided to electric power transmission systems or to electric power distribution systems.

Respondent's obligation to respond: Proposed language at 40 CFR 423.19 (c)–(l).

*Estimated number of respondents:* EPA estimates 100 steam electric facilities would be subject to this proposed rulemaking.

*Frequency of response:* EPA made the following assumptions for estimating frequency:

- NOPPs, notices, and the Leachate Groundwater Information Report (LGIR) would be submitted one time (in the first year of the requirements).
- Progress reports and the annual LGIR would be submitted once a year following the submittal of the official NOPP (*i.e.,* twice over a three-year period).

[186] The record also includes iodide in these discharges, another pollutant which should be considered alongside bromide for water quality-based effluent limitations.

[187] Available online at: *www.awwa.org/Portals/0/AWWA/ETS/Resources/17861ManagingBromideREPORT.pdf?ver=2020-01-09-151706-107.*

[188] U.S. EPA (Environmental Protection Agency). 2021. *PFAS Strategic Roadmap: EPA's Commitments to Action 2021–2024.* October 18. Available online at: *www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf.*

[189] Fox, Radhika. 2022. *Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations Where EPA is the Pretreatment Control Authority.* April 28. Available online at: *www.epa.gov/system/files/documents/2022-04/npdes_pfas-memo.pdf.*

[190] Fox, Radhika. 2022. *Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs.* December 5. Available online at: *https://www.epa.gov/system/files/documents/2022-12/NPDES_PFAS_State%20Memo_December_2022.pdf.*

[191] The maximum sampled concentrations in discharge from eight power plants was 28 ng/L for PFOS and 35 ng/L for PFOA, which the Wisconsin Department of Natural Resources theorized was due to concentration in cooling tower effluent.



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• Progress reports associated with EPA's VIP program or NOPPs that have already been submitted would be submitted once a year following the publication of the final rule.

*Total estimated burden:* For facilities, the estimated facility universe for any reporting for the purpose of this estimate is 100 facilities. EPA estimates the total one-time labor hours associated with this ICR for facilities is 11,525 and total annual labor hours ranging from 1,400 to 7,260 for a total annual average of 9,160 hours. For permitting/control authorities, the estimated total one-time labor hours associated with this ICR is 4,350 and total annual labor hours ranging from 30 to 1,900 for a total annual average of 2,700 hours. Burden is defined at 5 CFR 1320.3(b).

*Total estimated cost:* For facilities, EPA estimates the total one-time labor costs to be $667,000 and total annual labor costs to range from $81,000 to $422,300 for a total annual average of $531,000. For permitting/control Authorities, EPA estimates the total one-time labor costs to be $212,000 and total annual labor costs to range from $1,300 to $89,800 for a total annual average of $131,000.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

Submit your comments on EPA's need for this information, the accuracy of the provided burden estimates and any suggested methods for minimizing respondent burden using the docket identified at the beginning of this rule. Written comments and recommendations for the proposed information collection may also be sent within 30 days of publication of this notice to *www.reginfo.gov/public/do/PRAMain.* Find this particular information collection by selecting ''Currently under 30-day Review—Open for Public Comments'' or by using the search function. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after receipt, OMB must receive comments no later than April 28, 2023. EPA will respond to any ICR-related comments in the final rule.

### *C. Regulatory Flexibility Act*

I certify that this action will not have a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act. The small entities subject to the requirements of this action include small businesses and small governmental jurisdictions that own steam electric plants. EPA has determined that 229 to 427 entities own steam electric plants subject to the ELGs, of which 109 to 200 entities are small. These small entities own a total of 250 steam electric plants (out of the total of 871 plants), including 20 plants estimated to incur costs under the regulatory options. EPA considered the impacts of the regulatory options in this proposal on small businesses using a cost-to-revenue test. The analysis compares the cost of implementing wastewater controls under the four regulatory options to those under baseline (which reflects the 2020 rule, as explained in Section V of this preamble). Small entities estimated to incur compliance costs exceeding one or more of the one percent and three percent impact thresholds were identified as potentially incurring a significant impact. For the proposed rule (Option 3), EPA's analysis shows only three small entities (one non-utility and two municipalities) expected to incur incremental costs equal to or greater than one percent of revenue. For one of these small entities (non-utility), the incremental cost of the proposed rule exceeds three percent of revenue. Details of this analysis are presented in Chapter 8 of the RIA, included in the docket.

These results support EPA's finding of no significant impact on a substantial number of small entities.

### *D. Unfunded Mandates Reform Act*

This action contains a Federal mandate under the Unfunded Mandates Reform Act (UMRA), 2 U.S.C. 1531–1538 that may result in expenditures of $100 million (adjusted annually for inflation) or more for state, local, and tribal governments, in the aggregate, or the private sector in any one year ($170 million in 2021 dollars). Accordingly, EPA has prepared a written statement required under section 202 of UMRA. The statement is included in the docket for this action (see Chapter 9 in the RIA report) and briefly summarized below.

Consistent with the intergovernmental consultation provisions of section 204 of the UMRA, EPA has initiated consultations with government entities potentially affected by this proposed rule. As described in Section XVI.E of this preamble, EPA held consultation meetings with elected officials or their designated employees in January 2022 to ensure their meaningful and timely input into the proposed ELGs development. As described in Section XVI.F of this preamble, EPA also initiated consultation and coordination with federally recognized tribal governments in February 2022.

Consistent with section 205, EPA has identified and considered a reasonable number of regulatory alternatives to develop proposed BAT. These regulatory options are discussed in Section VII of this preamble. These options included a range of technology-based approaches. As discussed in detail in Section VII.B of this preamble, EPA is proposing Option 3 as the preferred BAT after considering the factors required under CWA section 304(b)(2)(B). The technologies are available, are economically achievable, and have acceptable non-water quality environmental impacts.

This proposed rule is not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. To assess the impact of compliance requirements on small governments (*i.e.,* governments with a population of less than 50,000), EPA compared total costs and costs per plant estimated to be incurred by small governments with the costs estimated to be incurred by large governments. EPA also compared costs for small government-owned plants with those of non-government-owned facilities. The Agency evaluated both the average and maximum annualized costs per plant. Chapter 9 of the RIA report provides details of these analyses. In all these comparisons, both for the cost totals and, in particular, for the average and maximum cost per plant, the costs for small government-owned facilities were less than those for large government-owned facilities or small non-government-owned facilities. On this basis, EPA concludes that the compliance cost requirements of the proposed steam electric ELGs would not significantly or uniquely affect small governments.

### *E. E.O. 13132: Federalism*

EPA has concluded that this action has federalism implications because it imposes direct compliance costs on state or local governments, and the Federal Government will not provide the funds necessary to pay those costs.

As discussed in Section XVI.B of this preamble, EPA anticipates that this proposed action would not impose incremental administrative burden on states from issuing, reviewing, and overseeing compliance with discharge requirements. EPA has identified 148 steam electric plants owned by 64 state or local government entities. Under the proposed regulatory Option 3 (BAT and PSES), EPA projects that 17 government-owned plants would incur



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compliance costs. EPA estimates that the maximum compliance cost in any one year to governments (excluding the Federal Government) for the four regulatory options ranges from $31 million under Option 1 to $46 million under Options 3 and 4 (see Chapter 9 of the RIA report for details).

EPA provides the following federalism summary impact statement.

EPA consulted with state and local officials early in the process of developing the proposed action to permit them to have meaningful and timely input into its development. EPA invited government officials to a consultation meeting held on January 27, 2022. EPA conducted outreach with several intergovernmental associations representing elected officials and encouraged their members to participate in the meeting, including the National Governors Association, the National Conference of State Legislatures, the Council of State Governments, the National Association of Counties, the National League of Cities, the U.S. Conference of Mayors, the County Executives of America, and the National Associations of Towns and Townships.

Participants representing 15 state and local government organizations participated in the virtual consultation meeting. EPA representatives were also present. EPA received five sets of unique written comments after the meeting. Two comments came from trade associations representing public water systems. These comments generally recommended more advanced treatment to reduce the pollutants making their way downstream to intakes for government-owned public water systems or, alternatively, to empower states to more effectively address these discharges. The remaining three comments came from the American Public Power Association and two of its member utilities. These comments recommended the retention of existing limitations and subcategories, a careful consideration of the CRL definition and BAT, and a compliance pathway for utilities that installed or are installing technologies to comply with the 2015 and 2020 rules.

As explained in Section VII of this preamble, EPA is proposing more stringent limitations on several wastestreams that would alleviate concerns raised by the public water systems. At the same time, EPA's preferred option (Option 3) includes retention of the permanent cessation of coal combustion subcategory and a proposed subcategory for early adopters. EPA believes these differentiated requirements would alleviate some of the concerns raised by publicly owned utilities. Further, as explained in Section VIII of this preamble, EPA's analysis demonstrates that the proposed requirements are economically achievable for the steam electric industry as a whole and for plants owned by state or local government entities. EPA is including in the docket for this proposed action a memorandum that responds to the comments it received through this consultation and the consultations described in Section XVI.F of this preamble below. For further information regarding the consultation process and supplemental materials provided to state and local government representatives, please go to the steam electric power generating effluent guidelines website at: *www.epa.gov/eg/2021-supplemental-steam-electric-rulemaking.* In the spirit of E.O. 13132, and consistent with EPA policy to promote communications between EPA and state and local governments, EPA specifically solicits comment on the proposed ELGs from state and local officials.

### *F. E.O. 13175: Consultation and Coordination With Indian Tribal Governments*

This proposed action would not have tribal implications, as specified in E.O. 13175 (65 FR 67249 (November 9, 2000)). It would not have substantial direct effects on tribal governments, on the relationship between the Federal Government and the Indian Tribes, or the distribution of power and responsibilities between the Federal Government and Indian Tribes as specified in E.O. 13175. EPA's analyses show that no facility subject to these proposed ELGs is owned by tribal governments. Thus, E.O. 13175 does not apply to this proposed action.

Although E.O. 13175 does not apply to this action, EPA consulted with tribal officials in developing this action. EPA initiated consultation and coordination with federally recognized tribal governments in January 2022, sharing information about the steam electric effluent guidelines rulemaking with the National Tribal Caucus, the National Tribal Water Council, and several individual tribes. EPA continued this government-to-government dialogue and, on February 1 and February 9, 2022, invited tribal representatives to participate in further discussions about the rulemaking process and objectives, with a focus on identifying specific ways the rulemaking may affect tribes.[192] The consultation process ended on March 29, 2022. While no tribal governments requested direct government-to-government consultations, EPA received written comments from three tribes: the Sault Ste. Marie Tribe of Chippewa Indians, the Mille Lacs Band of Ojibwe, and the Little Traverse Bay Bands of Odawa Indians. These comments conveyed the importance of historical tribal waters and rights (*e.g.,* fishing, trapping) and recommended more stringent technological controls to protect those rights or encourage retirement or fuel conversion of old coal-fired units. EPA is including in the docket for this action a memorandum that provides a response to the comments it received through this consultation and the consultations described in Sections XVI.D and XVI.E of this preamble above. For further information regarding the consultation process and supplemental materials provided to tribal representatives, please go to the steam electric power generating effluent guidelines website at: *www.epa.gov/eg/2021-supplemental-steam-electric-rulemaking.* EPA specifically solicits additional comment on this proposed action from tribal officials.

### *G. E.O. 13045: Protection of Children From Environmental Health Risks and Safety Risks*

This action is not subject to E.O. 13045 because EPA does not believe the environmental health risks or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessments are discussed in Chapters 4 and 5 of the BCA and are summarized below.

EPA identified several ways in which the proposed regulatory options could benefit children, including by potentially reducing health risks from exposure to pollutants present in steam electric plant discharges, or through impacts of the discharges on the quality of source water used by public water systems. This reduction arises from more stringent pollutant limitations as compared to baseline. In particular, EPA quantified the changes in IQ losses from lead exposure among preschool children and from mercury exposure *in utero* resulting from maternal fish consumption under the four regulatory options as compared to baseline. EPA also estimated changes in the lifetime risk of developing bladder cancer due to exposure to TTHM in drinking water. For this analysis, EPA did not estimate children-specific risks because these adverse health effects normally follow

[192] As discussed in Sections XIII and XVI.J of this preamble, EPA also did targeted outreach to communities in the top tier of its EJ screening analysis which included two tribal communities.



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long-term exposure. Finally, EPA estimated changes in air-related adverse health effects resulting from changes in the profile of electricity generation under Option 3 as compared to baseline. The analysis found that the resulting reductions in $PM_{2.5}$ and ozone will benefit children by reducing asthma onset and symptoms, allergy symptoms, emergency room visits and hospital visits for respiratory conditions, and school absences. These analyses show that all the regulatory options presented in this proposal would benefit children.

*H. E.O. 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use*

This proposed action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. EPA analyzed the potential energy effects of the proposed rule relative to baseline and found minimal or no impacts on electricity generation, generating capacity, cost of energy production, or dependence on a foreign supply of energy. Specifically, the Agency's analysis found that the proposed rule would not reduce electricity production by more than 1 billion kWhs per year or by 500 MW of installed capacity, nor would the proposed rule increase U.S. dependence on foreign energy supplies. For more detail on the potential energy effects of the regulatory options in this proposal, see section 10.7 in the RIA, available in the docket.

*I. National Technology Transfer and Advancement Act*

This rulemaking does not involve technical standards.

*J. E.O. 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*

E.O. 12898 (59 FR 7629, February 16, 1994) directs Federal agencies, to the greatest extent practicable and permitted by law, to make EJ part of their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations (people of color and/or Indigenous peoples) and low-income populations.

EPA believes that the human health or environmental conditions existing prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on people of color, low-income populations, and/or Indigenous peoples.

EPA believes that this action is likely to reduce existing disproportionate and adverse effects on people of color, low-income populations, and/or Indigenous peoples. A summary of the projected effects on these populations are contained in the EJA, which is available in the docket and summarized in Section XIII of this preamble above.

**Appendix A to the Preamble: Definitions, Acronyms, and Abbreviations Used in This Preamble**

The following acronyms, abbreviations, and terms are used in this preamble. These terms are provided for convenience to the reader and they are not regulatory definitions with the force or effect of law, nor are they to be used as guidance for implementation of this proposed rule.

*Administrator.* The Administrator of the U.S. Environmental Protection Agency.

*Agency.* U.S. Environmental Protection Agency.

*BAT.* Best available technology economically achievable, as defined by CWA sections 301(b)(2)(A) and 304(b)(2)(B).

*BCA.* Benefit Cost Analysis.

*Bioaccumulation.* General term describing a process by which chemicals are taken up by an organism either directly from exposure to a contaminated medium or by consumption of food containing the chemical, resulting in a net accumulation of the chemical over time by the organism.

*BMP.* Best management practice.

*BA.* Bottom ash. The ash, including EGU slag, that settles in a furnace or is dislodged from furnace walls. Economizer ash is included when it is collected with BA.

*BA purge water.* The water discharged from a wet BA handling system that recycles some, but not all, of its BA transport water.

*BPT.* The best practicable control technology currently available, as defined by CWA sections 301(b)(1) and 304(b)(1).

*CBI.* Confidential business information.

*CCR.* Coal combustion residuals.

*CWA.* Clean Water Act; The Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1251 *et seq.*), as amended, *e.g.,* by the Clean Water Act of 1977 (Pub. L. 95–217) and the Water Quality Act of 1987 (Pub. L. 100–4).

*Combustion residuals.* Solid wastes associated with combustion-related power plant processes, including fly ash and BA from coal-, petroleum coke-, or oil-fired units; FGD solids; FGMC wastes; and other wastewater treatment solids associated with combustion wastewater. In addition to the residuals associated with coal combustion, this also includes residuals associated with the combustion of other fossil fuels.

*Direct discharge.* (1) Any addition of any ''pollutant'' or combination of pollutants to ''waters of the United States'' from any ''point source'' or (2) any addition of any pollutant or combination of pollutant to waters of the ''contiguous zone'' or the ocean from any point source other than a vessel or other floating craft that is being used as a means of transportation. This definition includes additions of pollutants into waters of the United States from surface runoff that is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a state, municipality, or other person that do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances that lead into privately owned treatment works. This term does not include addition of pollutants by any ''indirect discharger.''

*Direct discharger.* A plant that discharges treated or untreated wastewaters into waters of the United States.

*DOE.* Department of Energy.

*Dry BA handling system.* A system that does not use water as the transport medium to convey BA away from the EGU. Dry handling systems include systems that collect and convey the BA without using any water, as well as systems in which BA is quenched in a water bath and then mechanically or pneumatically conveyed away from the EGU. Dry BA handling systems do not include wet sluicing systems (such as remote MDS or complete recycle systems).

*Effluent limitation.* Under CWA section 502(11), any restriction, including schedules of compliance, established by a state or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents that are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean.

*EGU.* Electric generating unit.

*EIA.* Energy Information Administration.

*EJA.* Environmental Justice Analysis

*ELGs.* Effluent limitations guidelines and standards.

*E.O.* Executive Order.

*EPA.* U.S. Environmental Protection Agency.

*FA.* Fly ash.

*Facility.* Any NPDES ''point source'' or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

*FGD.* Flue gas desulfurization.

*FGD wastewater.* Wastewater generated specifically from the wet FGD scrubber system that contacts the flue gas or the FGD solids, including, but not limited to, the blowdown or purge from the FGD scrubber system, overflow or underflow from the solids separation process, FGD solids wash water, and the filtrate from the solids dewatering process. Wastewater generated from cleaning the FGD scrubber, cleaning FGD solids separation equipment, cleaning FGD solids dewatering equipment, or that is collected in floor drains in the FGD process area is not considered FGD wastewater.

*Fly ash.* The ash that is carried out of the furnace by a gas stream and collected by a capture device such as a mechanical precipitator, electrostatic precipitator, and/or fabric filter. Economizer ash is included in this definition when it is collected with FA. Ash is not included in this definition when it is collected in wet scrubber air pollution control systems whose primary purpose is particulate removal.

*Groundwater.* Water that is found in the saturated part of the ground underneath the land surface.



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*Indirect discharge.* Wastewater discharged or otherwise introduced to a POTW.

*IPM.* Integrated Planning Model.

*Landfill.* A disposal facility or part of a facility or plant where solid waste, sludges, or other process residuals are placed in or on any natural or manmade formation in the earth for disposal and which is not a storage pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome or salt bed formation, an underground mine, a cave, or a corrective action management unit.

*MDS.* Mechanical drag system.

*Mechanical drag system.* BA handling system that collects BA from the bottom of an EGU in a water-filled trough. The water bath in the trough quenches the hot BA as it falls from the EGU and seals the EGU gases. A drag chain operates in a continuous loop to drag BA from the water trough up an incline, which dewaters the BA by gravity, draining the water back to the trough as the BA moves upward. The dewatered BA is often conveyed to a nearby collection area, such as a small bunker outside the EGU building, from which it is loaded onto trucks and either sold or transported to a landfill. The MDS is considered a dry BA handling system because the ash transport mechanism is mechanical removal by the drag chain, not the water.

*Mortality.* Death rate or proportion of deaths in a population.

*NAICS.* North American Industry Classification System.

*NPDES.* National Pollutant Discharge Elimination System.

*NSPSs.* New Source Performance Standards.

*ORCR.* Office of Resource Conservation and Recovery.

*Paste.* A substance containing solids in a fluid which behaves as a solid until a force is applied that causes it to behave like a fluid.

*Paste landfill.* A landfill that receives any paste designed to set into a solid after the passage of a reasonable amount of time.

*Point source.* Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel, or other floating craft from which pollutants are or may be discharged. The term does not include agricultural stormwater discharges or return flows from irrigated agriculture. *See* CWA section 502(14), 33 U.S.C. 1362(14); 40 CFR 122.2.

*POTW.* Publicly owned treatment works. *See* CWA section 212, 33 U.S.C. 1292; 40 CFR 122.2, 403.3.

*PSES.* Pretreatment Standards for Existing Sources.

*Publicly owned treatment works.* Any device or system owned by a state or municipality that is used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature. These include sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment. *See* CWA section 212, 33 U.S.C. 1292; 40 CFR 122.2, 403.3.

*PSC.* Public service commission.

*PUC.* Public utility commission.

*RCRA.* The Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901 *et seq.*

*Remote MDS.* BA handling system that collects BA at the bottom of the EGU, then uses transport water to sluice the ash to a remote MDS that dewaters BA using a similar configuration as the MDS. The remote MDS is considered a wet BA handling system because the ash transport mechanism is water.

*RO.* Reverse osmosis.

*RFA.* Regulatory Flexibility Act.

*SBA.* Small Business Administration.

*Sediment.* Particulate matter lying below water.

*Surface water.* All waters of the United States, including rivers, streams, lakes, reservoirs, and seas.

*Toxic pollutants.* As identified under the CWA, 65 pollutants and classes of pollutants, of which 126 specific substances have been designated priority toxic pollutants. *See* Appendix A to 40 CFR part 423.

*Transport water.* Wastewater that is used to convey FA, BA, or economizer ash from the ash collection or storage equipment or EGU, and has direct contact with the ash. Transport water does not include low volume, short duration discharges of wastewater from minor leaks (*e.g.,* leaks from valve packing, pipe flanges, or piping) or minor maintenance events (*e.g.,* replacement of valves or pipe sections).

*UMRA.* Unfunded Mandates Reform Act.

*Wet BA handling system.* A system in which BA is conveyed away from the EGU using water as a transport medium. Wet BA systems typically send the ash slurry to dewatering bins or a surface impoundment. Wet BA handling systems include systems that operate in conjunction with a traditional wet sluicing system to recycle all BA transport water (*e.g.,* remote MDS or complete recycle systems).

*Wet FGD system.* Wet FGD systems capture sulfur dioxide from the flue gas using a sorbent that has mixed with water to form a wet slurry, and that generates a water stream that exits the FGD scrubber absorber.

**List of Subjects in 40 CFR Part 423**

Environmental protection, Electric power generation, Power facilities, Waste treatment and disposal, Water pollution control.

**Michael S. Regan,**

*Administrator.*

For the reasons stated in the preamble, the Environmental Protection Agency proposes to amend 40 CFR part 423 as follows:

## PART 423—STEAM ELECTRIC POWER GENERATING POINT SOURCE CATEGORY

■ 1. The authority citation for part 423 is revised to read as follows:

**Authority:** Secs. 101; 301; 304(b), (c), (e), (g), and (i)(A) and (B); 306; 307; 308 and 501, Clean Water Act (Federal Water Pollution Control Act Amendments of 1972, as amended; 33 U.S.C. 1251 *et seq.;* 1311; 1314(b), (c), (e), (g), and (i)(A) and (B); 1316; 1317; 1318 and 1361).

■ 2. Amend § 423.11 by:

■ a. Revising paragraphs (x), (y), and (z);

■ b. Removing paragraph (bb);

■ c. Redesignating paragraph (cc) as paragraph (bb) and revising new paragraph (bb);

■ d. Redesignating paragraph (dd) as paragraph (cc); and

■ e. Adding new paragraphs (dd) and (ee).

The revisions and additions read as follows:

**§ 423.11 Specialized definitions.**

* * * * *

(x) The term ''early adopter'' means the owner or operator certifies under § 423.19(e) that an electric generating unit that generated FGD wastewater on or after October 13, 2020, has installed by March 24, 2023 biological treatment equipment or zero valent iron treatment equipment to meet all applicable limitations in § 423.13(g) or 423.16(e) as those provisions existed on October 13, 2020, and bottom ash handling equipment to meet all applicable limitations in § 423.13(k) or 423.16(g) as those provisions existed on October 13, 2020; that the installed equipment does meet such applicable limitations as of March 24, 2023; and that such electric generating unit will and does permanently cease combustion of coal no later than December 31, 2032.

(y) The term ''surface impoundment'' means a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of coal combustion residuals and liquids, and the unit treats, stores, or disposes of coal combustion residuals.

(z) The term ''tank'' means a stationary device, designed to contain an accumulation of wastewater, which is constructed primarily of non-earthen materials (*e.g.,* wood, concrete, steel, plastic) that provide structural support, and which is not a surface impoundment.

* * * * *

(bb) The term ''bottom ash purge water'' means any water being discharged subject to § 423.13(k)(2)(i) or 423.16(g)(3).

(cc) The term ''30-day rolling average'' means the series of averages using the measured values of the preceding 30 days for each average in the series.

(dd) The term ''surface impoundment decant wastewater'' means the layer of a closing surface impoundment's wastewater which is located from the water surface down to the level sufficiently above any coal combustion

residuals that, when drained, does not resuspend the coal combustion residuals.

(ee) The term ''surface impoundment dewatering wastewater'' means the layer of a closing surface impoundment's wastewater which is located below surface impoundment decant wastewater due to its contact with either stationary or resuspended coal combustion residuals. * * * * *

■ 3. Amend § 423.12 by revising paragraph (b)(11) to read as follows:

**§ 423.12 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).**

* * * * *

(b)* * *

(11) The quantity of pollutants discharged in FGD wastewater, flue gas mercury control wastewater, combustion residual leachate, gasification wastewater, bottom ash purge water, surface impoundment decant wastewater, and surface impoundment dewatering wastewater shall not exceed the quantity determined by multiplying the flow of the applicable wastewater times the concentration listed in the following table:

TABLE 7 TO PARAGRAPH (b)(11)

| Pollutant or pollutant property | BPT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day (mg/L) | Average of daily values for 30 consecutive days shall not exceed (mg/L) |
| TSS | 100.0 | 30.0 |
| Oil and grease | 20.0 | 15.0 |

* * * * *

■ 4. Amend § 423.13 by:

■ a. Revising paragraphs (g)(1), (2)(ii), (2)(iii), (3)(ii), (k)(1), (2)(i), (2)(iii), (l);

■ b. Redesignating paragraph (n) as paragraph (p);

■ c. Redesignating paragraph (m) as paragraph (n) and adding new paragraph (m); and

■ d. Revising paragraphs (o)(1), and (3).

The revisions and additions read as follows:

**§ 423.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).**

* * * * *

(g)(1)(i) *FGD wastewater.* Except for those discharges to which paragraph (g)(2) or (3) of this section applies, there shall be no discharge of pollutants in FGD wastewater. Dischargers must meet the discharge limitation in this paragraph by a date determined by the permitting authority that is as soon as possible beginning [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE], but no later than December 31, 2029. These effluent limitations apply to the discharge of FGD wastewater generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph.

(ii) FGD wastewater generated before the date determined by the permitting authority as specified in paragraph (g)(1)(i) of this section.

(A) [Reserved]

* * * * *

(2) * * *

(ii) For any electric generating unit subject to paragraph (g)(2)(i) of this section for which the owner has submitted a certification for the permanent cessation of coal combustion pursuant to § 423.19(f) and has not transferred between subcategories under paragraph (o) of this section, after December 31, 2028, there shall be no discharge of pollutants in FGD wastewater. Any permit issued beginning [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE] must contain this no discharge requirement applicable as of January 1, 2029.

(iii) For FGD wastewater discharges from an early adopter electric generating unit, on or before December 31, 2032, the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in the table following this paragraph (g)(2)(iii) of this section. After December 31, 2032, there shall be no discharge of pollutants in FGD wastewater. Any permit issued beginning [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE] must contain this no discharge requirement applicable as of January 1, 2033.

TABLE 6 TO PARAGRAPH (g)(2)(iii)

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (μg/L) | 18 | 8 |
| Mercury, total (ng/L) | 103 | 34 |
| Selenium, total (μg/L) | 70 | 29 |
| Nitrate/nitrite as N (mg/L) | 4 | 3 |

* * * * *

(3) * * *

(ii) FGD wastewater generated before December 31, 2028.

(A) For discharges of FGD wastewater generated before December 31, 2023, the quantity of pollutants discharged in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed for TSS in § 423.12(b)(11).

(B) [Reserved].

* * * * *

(k)(1)(i) *Bottom ash transport water.* Except for those discharges to which paragraph (k)(2) of this section applies, or when the bottom ash transport water is used in the FGD scrubber, there shall be no discharge of pollutants in bottom ash transport water. Dischargers must meet the discharge limitation in this paragraph by a date determined by the permitting authority that is as soon as possible beginning [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE], but no later than December 31, 2029. This limitation applies to the discharge of bottom ash transport water generated on and after the date determined by the permitting authority for meeting the discharge limitation, as specified in this paragraph. Except for those discharges to which paragraph (k)(2) of this section applies, whenever bottom ash transport water is used in any other plant process or is sent to a treatment system at the plant (except when it is used in the FGD scrubber), the resulting effluent must comply with the discharge limitation in this paragraph. When the bottom ash transport water is used in the FGD scrubber, it ceases to be bottom ash transport water, and instead is FGD wastewater, which must meet the requirements in paragraph (g) of this section.

(ii) Bottom ash transport water generated before the date determined by the permitting authority as specified in paragraph (k)(1)(i) of this section.

(A) [Reserved]

(2)(i) For early adopter electric generating units:

(A) The discharge of pollutants in bottom ash transport water from a properly installed, operated, and maintained bottom ash system on or before December 31, 2032, is authorized under the following conditions, and after December 31, 2032, there shall be no discharge of pollutants in BA transport water. Any permit issued beginning [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE] must contain this no discharge requirement.

(*1*) To maintain system water balance when precipitation-related inflows are generated from storm events exceeding a 10-year storm event of 24-hour or longer duration (*e.g.,* 30-day storm event) and cannot be managed by installed spares, redundancies, maintenance tanks, and other secondary bottom ash system equipment; or

(*2*) To maintain system water balance when regular inflows from wastestreams other than bottom ash transport water exceed the ability of the bottom ash system to accept recycled water and segregating these other wastestreams is not feasible; or

(*3*) To maintain system water chemistry where installed equipment at the facility is unable to manage pH, corrosive substances, substances or conditions causing scaling, or fine particulates to below levels which impact system operation or maintenance; or

(*4*) To conduct maintenance not otherwise included in paragraphs (k)(2)(i)(A)(*1*), (*2*), or (*3*) of this section and not exempted from the definition of transport water in § 423.11(p), and when water volumes cannot be managed by installed spares, redundancies, maintenance tanks, and other secondary bottom ash system equipment.

(B) The total volume that may be discharged for the activities in paragraph (k)(2)(i)(A) of this section shall be reduced or eliminated to the extent achievable using control measures (including best management practices) that are technologically available and economically achievable in light of best industry practice. The total volume of the discharge authorized in this paragraph shall be determined on a case-by-case basis by the permitting authority and in no event shall such discharge exceed a 30-day rolling average of ten percent of the primary active wetted bottom ash system volume. The volume of daily discharges used to calculate the 30-day rolling average shall be calculated using measurements from flow monitors.

* * * * *

(iii) For any electric generating unit subject to paragraph (k)(2)(ii) of this section for which the owner has submitted a certification for the permanent cessation of coal combustion pursuant to § 423.19(f), and has not transferred to another subcategory under paragraph (o) of this section, after December 31, 2028, there shall be no discharge of pollutants in bottom ash transport water. Any permit issued beginning [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE] must contain this no discharge requirement applicable as of January 1, 2029.

(l) *Combustion residual leachate.* The quantity of pollutants in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration listed in the table following this paragraph (l). Dischargers must meet the effluent limitations in this paragraph by a date determined by the permitting authority that is as soon as possible beginning [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE], but no later than December 31, 2029. These effluent limitations apply to the discharge of combustion residual leachate generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph.

TABLE 9 TO PARAGRAPH (l)

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

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(m)(1) Surface impoundment decant wastewater.

(A) [Reserved].

(2) Surface impoundment dewatering wastewater.

(A) [Reserved].

(3) Bottom ash purge water.

(A) [Reserved].

(n) At the permitting authority's discretion, the quantity of pollutant allowed to be discharged may be expressed as a concentration limitation instead of any mass-based limitations specified in paragraphs (b) through (m) of this section. Concentration limitations shall be those concentrations specified in this section.

(o)(1) Transfer between subcategories and applicable limitations in a permit. Where, in the permit, the permitting authority has included alternative limitations subject to eligibility requirements, upon timely notification to the permitting authority under § 423.19(i), a facility can become subject to the alternative limitations under the following circumstances:

(i) On or before December 31, 2025, a facility may convert:

(A) From voluntary incentives program limitations under paragraph (g)(3)(i) of this section to limitations for electric generating units permanently ceasing coal combustion under paragraph (g)(2)(i) of this section; or

(B) From limitations for electric generating units permanently ceasing coal combustion under paragraphs (g)(2)(i) or (k)(2)(ii) of this section to voluntary incentives program limitations under paragraphs (g)(3)(i) of this section or generally applicable limitations under (k)(1)(i) of this section.

* * * * *

(3) Where a facility seeking a transfer is currently subject to more stringent limitations than the limitations being sought, the facility must continue to meet those more stringent limitations.

(p) In the event that wastestreams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (a) through (n) of this section attributable to each controlled waste source shall not exceed the specified limitation for that waste source.

■ 5. Amend § 423.16 by revising paragraphs (e)(1) and (g)(1), and adding paragraphs (j) and (k) to read as follows:

**§ 423.16 Pretreatment standards for existing sources (PSES).**

* * * * *

(e)(1) *FGD wastewater.* (i) Except as provided for in paragraph (e)(2) of this section, for any electric generating unit with a total nameplate generating capacity of more than 50 megawatts, that is not an oil-fired unit, and that the owner has not certified to the permitting authority that it will permanently cease coal combustion pursuant to § 423.19(f), there shall be no discharge of pollutants in FGD wastewater. Dischargers must meet the standards in this paragraph by [DATE 3 YEARS AFTER DATE OF PUBLICATION OF FINAL RULE] except as provided for in paragraph (e)(2) of this section. These standards apply to the discharge of FGD wastewater generated on and after [DATE 3 YEARS AFTER DATE OF PUBLICATION OF FINAL RULE].

(ii) For any electric generating unit excepted from paragraph (e)(1)(i) of this section because the owner has submitted a certification for the permanent cessation of coal combustion pursuant to § 423.19(f), after December 31, 2028, there shall be no discharge of pollutants in FGD wastewater.

(2) For FGD wastewater discharges from an early adopter electric generating unit, on or before December 31, 2032, the quantity of pollutants in FGD wastewater shall not exceed the quantity determined by multiplying the flow of FGD wastewater times the concentration listed in the table following this paragraph (e)(2) of this section. After December 31, 2032, there shall be no discharge of pollutants in FGD wastewater.

TABLE 3 TO PARAGRAPH (e)(2)

| Pollutant or pollutant property | PSES | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (ug/L) | 18 | 8 |
| Mercury, total (ng/L) | 103 | 34 |
| Selenium, total (ug/L) | 70 | 29 |
| Nitrate/nitrite as N (mg/L) | 4 | 3 |

* * * * *

(g) *Bottom ash transport water.* (1) Except for those discharges to which paragraph (g)(2) of this section applies, or when the bottom ash transport water is used in the FGD scrubber, for any electric generating unit with a total nameplate generating capacity of more than 50 megawatts, that is not an oil-fired unit, and that the owner has not certified to the permitting authority that the electric generating unit will permanently cease coal combustion pursuant to § 423.19(f), there shall be no discharge of pollutants in bottom ash transport water. This standard applies to the discharge of bottom ash transport water generated on and after [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE]. Except for those discharges to which paragraph (g)(3) of this section applies, whenever bottom ash transport water is used in any other plant process or is sent to a treatment system at the plant the resulting effluent must comply with the discharge standard in this paragraph.

(2) For any electric generating unit excepted from paragraph (g)(1) because the owner has submitted a certification for the permanent cessation of coal combustion pursuant to § 423.19(f), after December 31, 2028, there shall be no discharge of pollutants in bottom ash transport water.

(3) For early adopter electric generating units:

(i) The discharge of pollutants in bottom ash transport water from a properly installed, operated, and maintained bottom ash system on or before December 31, 2032, is authorized under the following conditions, and after December 31, 2032, there shall be no discharge of pollutants in BA transport water.

(A) To maintain system water balance when precipitation-related inflows are generated from a 10-year storm event of 24-hour or longer duration (*e.g.,* 30-day



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storm event) and cannot be managed by installed spares, redundancies, maintenance tanks, and other secondary bottom ash system equipment; or

(B) To maintain system water balance when regular inflows from wastestreams other than bottom ash transport water exceed the ability of the bottom ash system to accept recycled water and segregating these other wastestreams is feasible; or

(C) To maintain system water chemistry where current operations at the facility are unable to currently manage pH, corrosive substances, substances or conditions causing scaling, or fine particulates to below levels which impact system operation or maintenance; or

(D) To conduct maintenance not otherwise included in paragraphs (g)(3)(i)(A), (B), or (C) of this paragraph and not exempted from the definition of transport water in § 423.11(p), and when water volumes cannot be managed by installed spares, redundancies, maintenance tanks, and other secondary bottom ash system equipment.

(ii) The total volume that may be discharged to a POTW for the activities in paragraph (g)(3)(i) of this section shall be reduced or eliminated to the extent achievable as determined by the control authority. The control authority may also include control measures (including best management practices) that are technologically available and economically achievable in light of best industry practice. In no event shall the total volume of the discharge exceed a 30-day rolling average of ten percent of the primary active wetted bottom ash system volume. The volume of daily discharges used to calculate the 30-day rolling average shall be calculated using measurements from flow monitors.

* * * * *

(j) Combustion residual leachate. The quantity of pollutants in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration listed in the table following this paragraph (j). Dischargers must meet the standards in this paragraph [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE].

TABLE 5 TO PARAGRAPH (j)

| Pollutant or pollutant property | PSES | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (ug/L) | 11 | 8 |
| Mercury, total (ng/L) | 788 | 356 |

(k) Surface impoundment decant wastewater, surface impoundment dewatering wastewater, and bottom ash purge water.

(1) Surface impoundment decant wastewater.

(A) [Reserved].

(2) Surface impoundment dewatering wastewater.

(A) [Reserved].

(3) Bottom ash purge water.

(A) [Reserved].

■ 6. Amend § 423.18 by revising paragraph (a) to read as follows.

**§ 423.18 Permit conditions.**

(a) All permits subject to this part shall include the following permit conditions:

(1) An electric generating unit shall qualify as permanently ceasing the combustion of coal by December 31, 2028, or December 31, 2032, if such qualification would have been demonstrated absent the following qualifying event:

(i) An emergency order issued by the Department of Energy under Section 202(c) of the Federal Power Act;

(ii) A reliability must run agreement issued by a Public Utility Commission; or

(iii) Any other reliability-related order or agreement issued by a competent electricity regulator (*e.g.,* an independent system operator) which results in that electric generating unit operating in a way not contemplated when the certification was made; or

(2)(i) The operation of the electric generating unit was necessary for load balancing in an area subject to a declaration under 42 U.S.C. 5121 *et seq.,* that there exists:

(A) An ''Emergency''; or

(B) A ''Major Disaster''; and

(3) That load balancing was due to the event that caused the ''Emergency'' or ''Major Disaster'' in paragraph (a)(2)(i) of this section to be declared.

* * * * *

■ 7. Amend § 423.19 by:

■ a. Removing paragraph (d);

■ b. Redesignating paragraph (c) as paragraph (d) and adding a new paragraph (c) and revising the newly designated paragraph (d);

■ c. Revising paragraphs, (e), (f)(1) and (4), (i), and (j); and

■ d. Adding paragraph (k).

The revisions and additions read as follows:

**§ 423.19 Reporting and recordkeeping requirements.**

* * * * *

(c) Publicly accessible internet site requirements.

(1) Except as provided in paragraph (c)(2) of this section, each facility subject to the requirements of this part must maintain a publicly accessible internet site (ELG website) containing the information specified in paragraphs (d) through (l) of this section, if applicable. This website shall be titled ''ELG Rule Compliance Data and Information.'' The facility must ensure that all information required to be posted is immediately available to anyone visiting the site, without requiring any prerequisite, such as registration or a requirement to submit a document request. All required information must be clearly identifiable and must be able to be immediately downloaded by anyone accessing the site in a format that enables additional analysis (*e.g.,* comma-separated values text file format). When the facility initially creates, or later changes, the web address (*i.e.,* Uniform Resource Locator (URL)) at any point, they must notify EPA via the ''contact us'' form on EPA's Effluent Guidelines website and the permitting authority or control authority within 14 days of creating the website or making the change. The facility's ELG website must also have a ''contact us'' form or a specific email address posted on the website for the public to use to submit questions and issues relating to the availability of information on the website.



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(2) Combined websites.

(i) When an owner or operator subject to this section already maintains a ''CCR Rule Compliance Data and Information'' website pursuant to 40 CFR 257.107, the postings required under this section may be made to the existing ''CCR Rule Compliance Data and Information'' website and shall be delineated under a separate heading that shall state ''ELG Rule Compliance Data and Information.'' When electing to use an existing website pursuant to this paragraph, the facility shall notify EPA via the ''contact us'' form on EPA's Effluent Guidelines website and the permitting authority or control authority no later than [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE].

(ii) When the same owner or operator is subject to the provisions of this part for multiple facilities, the owner or operator may comply with the requirements of this section by using the same internet site for multiple facilities provided the ELG website clearly delineates information by the name of each facility.

(3) Unless otherwise required in this section, the information required to be posted to the ELG website must be made available to the public for at least 10 years following the date on which the information was first posted to the ELG website, or the length of the permit plus five years, whichever is longer. All required information must be clearly identifiable and must be able to be immediately downloaded by anyone accessing the site in a format that enables additional analysis (*e.g.,* comma-separated values text file format).

(4) Unless otherwise required in this section, the information must be posted to the ELG website:

(i) Within 30 days of submitting the information to the permitting authority or control authority; or

(ii) Where information was submitted to the permitting authority or control authority prior to [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE], by [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE].

(d) Requirements for early adopter electric generating units discharging bottom ash transport water pursuant to § 423.13(k)(2)(i) or 423.16(g)(3).

(1) *Initial Certification Statement.* For sources seeking to discharge bottom ash transport water pursuant to § 423.13(k)(2)(i) or 423.16(g)(3), an initial certification shall be submitted to the permitting authority by [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE].

(2) *Signature and certification.* The certification statement must be signed and certified by a professional engineer.

(3) *Contents.* An initial certification shall include the following:

(i) A statement that the professional engineer is a licensed professional engineer.

(ii) A statement that the professional engineer is familiar with the regulation requirements.

(iii) A statement that the professional engineer is familiar with the facility.

(iv) The primary active wetted bottom ash system volume in § 423.11(aa).

(v) Material assumptions, information, and calculations used by the certifying professional engineer to determine the primary active wetted bottom ash system volume.

(vi) A list of all potential discharges under § 423.13(k)(2)(i)(A)(*1*) through (A)(*4*) or 423.16(g)(3)(i) through (iv), the expected volume of each discharge, and the expected frequency of each discharge.

(vii) Material assumptions, information, and calculations used by the certifying professional engineer to determine the expected volume and frequency of each discharge including a narrative discussion of why such water cannot be managed within the system and must be discharged.

(viii) A list of all wastewater treatment systems at the facility currently, or otherwise required by a date certain under this section.

(ix) A narrative discussion of each treatment system including the system type, design capacity, and current or expected operation.

(e) Requirements for early adopter electric generating units.

(1) *Notice of Planned Participation.* For sources seeking to qualify as early adopter electric generating units that will achieve permanent cessation of coal combustion by December 31, 2032, under this part, a Notice of Planned Participation shall be submitted to the permitting authority or control authority no later than [DATE 1 YEAR AFTER DATE OF PUBLICATION OF FINAL RULE].

(2) *Contents.* A Notice of Planned Participation shall identify the early adopter electric generating unit intended to achieve the permanent cessation of coal combustion. A Notice of Planned Participation shall include:

(i) A statement that the electric generating unit discharged FGD wastewater on or after October 13, 2020;

(ii) A statement that the facility was in compliance with the FGD wastewater limitations of § 423.13(g)(2)(iii) or 423.16(e)(2)(i) as those provisions existed on October 13, 2020, and where applicable the bottom ash transport water limitations of § 423.13(k)(2)(i) or 423.16(g)(2)(i) as those provisions existed on October 13, 2020, by March 24, 2023 with the following additional details:

(A) A diagram of the treatment chain for FGD wastewater, including the biological treatment or zero valent iron component, with a complete narrative discussion explaining the components of the treatment chain including the flows entering, leaving, or passing through each component, a description of any solids generated by each component, and measurements (or where necessary, estimates) of both the flows and solids (*e.g.,* gallons per minute, tons per day, etc.);

(B) A diagram of the bottom ash handling system with a complete narrative discussion explaining the treatment chain including the flows entering, leaving, or passing through each component, a description of any solids generated by each component, and measurements (or where necessary, estimates) of both the flows and solids (*e.g.,* gallons per minute, tons per day, etc.);

(C) The dates the treatment chains in paragraph (e)(2)(ii) of this section were commissioned, or where separate components were commissioned on different dates, the commission dates of each;

(D) All effluent monitoring data from the relevant outfall(s) or, where an internal monitoring location(s) was used, from the internal monitoring location(s); and

(E) Where applicable, the data and calculations demonstrating compliance of the diluted FGD wastewater where monitoring data from the relevant outfall captures a diluted wastestream shall include a narrative discussion of all data, assumptions, and calculations such that an independent party could duplicate the work.

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(iii) The expected date that each electric generating unit is projected to achieve permanent cessation of coal combustion, whether each date represents a retirement or a fuel conversion, whether each retirement or fuel conversion has been approved by a regulatory body, and what the relevant regulatory body is. The Notice of Planned Participation shall also include a copy of the most recent integrated resource plan for which the applicable state agency approved the retirement or repowering of the unit subject to the ELGs, or other documentation supporting that the electric generating unit will permanently cease the combustion of coal by December 31, 2032. The Notice of Planned Participation shall also include, for each such electric generating unit, a timeline to achieve the permanent cessation of coal combustion. Each timeline shall include interim milestones and the projected dates of completion.

(3) *Annual Progress Report.* Annually after submission of the Notice of Planned Participation in paragraph (e)(1) of this section, a progress report shall be filed with the permitting authority, or control authority in the case of an indirect discharger.

(4) *Contents.* An Annual Progress Report shall detail the completion of any interim milestones listed in the Notice of Planned Participation since the previous progress report, provide a narrative discussion of any completed, missed, or delayed milestones, and provide updated milestones. An annual progress report shall also include one of the following:

(i) A copy of the official suspension filing (or equivalent filing) made to the facility's reliability authority detailing the conversion to a fuel source other than coal;

(ii) A copy of the official retirement filing (or equivalent filing) made to the facility's reliability authority which must include a waiver of recission rights; or

(iii) An initial certification, or recertification for subsequent annual progress reports, containing either a statement that the facility will make the filing required in paragraph (e)(4)(i) of this section or a statement that the facility will make the filing required in paragraph (e)(4)(ii) of this section. The certification or recertification must include the estimated date that such a filing will be made.

(iv) A facility shall not include a certification or recertification under paragraph (e)(4)(iii) of this section in the final annual progress report submitted prior to permanent cessation of coal combustion. Rather, this final annual progress report must include the filing under paragraph (e)(4)(i) or (ii) of this section.

* * * * *

(f) * * *

(1) *Notice of Planned Participation.* For sources seeking to qualify as an electric generating unit that will achieve permanent cessation of coal combustion by December 31, 2028, under this part, a Notice of Planned Participation shall be made to the permitting authority, or to the control authority in the case of an indirect discharger, no later than [DATE 60 DAYS AFTER DATE OF PUBLICATION OF FINAL RULE].

* * * * *

(4) *Contents.* An Annual Progress Report shall detail the completion of any interim milestones listed in the Notice of Planned Participation since the previous progress report, provide a narrative discussion of any completed, missed, or delayed milestones, and provide updated milestones. An annual progress report shall also include one of the following:

(i) A copy of the official suspension filing (or equivalent filing) made to the facility's reliability authority detailing the conversion to a fuel source other than coal;

(ii) A copy of the official retirement filing (or equivalent filing) made to the facility's reliability authority which must include a waiver of recission rights; or

(iii) An initial certification, or recertification for subsequent annual progress reports, containing either a statement that the facility will make the filing required in paragraph (f)(4)(i) of this section or a statement that the facility will make the filing required in paragraph (f)(4)(ii) of this section. The certification or recertification must include the estimated date that such a filing will be made.

(iv) A facility shall not include a certification or recertification under paragraph (f)(4)(iii) of this section in the final annual progress report submitted prior to permanent cessation of coal combustion. Rather, this final annual progress report must include the filing under paragraph (f)(4)(i) or (ii) of this section.

* * * * *

(i) Requirements for facilities seeking to transfer between subcategories and applicable limitations in a permit under § 423.13(o).

(1) *Notice of Planned Participation.* For sources which have filed a Notice of Planned Participation under paragraphs (f)(1) or (h)(1) of this section and intend to make changes that would qualify them for a different set of requirements under § 423.13(o), a Notice of Planned Participation shall be made to the permitting authority, or to the control authority in the case of an indirect discharger, no later than the dates stated in § 423.13(o)(1).

(2) *Contents.* A Notice of Planned Participation shall include a list of the electric generating units for which the source intends to change compliance alternatives. For each such electric generating unit, the notice shall list the specific provision under which this transfer will occur, the reason such a transfer is warranted, and a narrative discussion demonstrating that each electric generating unit will be able to maintain compliance with the relevant provisions.

(j) Notice of Material Delay.

(1) *Notice.* Within 30 days of experiencing a material delay in the milestones set forth in paragraphs (e)(2), (f)(2), or (h)(2) of this section, and where such a delay may preclude permanent cessation of coal combustion or compliance with the voluntary incentives program limitations by December 31, 2028, or December 31, 2032, for early adopter electric generating units, a facility shall file a notice of material delay with the permitting authority, or control authority in the case of an indirect discharger.

(2) *Contents.* The contents of such a notice shall include the reason for the delay, the projected length of the delay, and a proposed resolution to maintain compliance.

(k) Requirements for facilities with coal combustion residual landfills or surface impoundments

(1) *Annual Combustion Residual Leachate Monitoring Report.* In addition to reporting pursuant to 40 CFR part 127, each facility treating combustion residual leachate in groundwater to comply with § 423.13(l) or 423.16(j) shall file an annual combustion residual leachate monitoring report each calendar year to the permitting authority or control authority for indirect discharges of the treated CRL.



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(2) *Contents.* The annual combustion residual leachate monitoring report shall provide the following monitoring data for each pollutant listed in the table following this section. For paragraphs (k)(2)(ii) and (iii) of this section the report shall also describe the location of monitoring wells, screening depth, and frequency of sampling. The report shall include summary statistics including monthly minimum, maximum, and average concentrations for each pollutant. The report shall be supported by an appendix of all samples.

(i) Effluent monitoring data reported pursuant to 40 CFR part 127.

(ii) Groundwater monitoring data as the combustion residual leachate leaves each of the landfills and surface impoundments discharging through groundwater.

(iii) Groundwater monitoring at the point the combustion residual leachate enters each surface waterbody.

(iv) Summary statistics for the data described in paragraphs (k)(2)(i) through (iii) of this section including the monthly average and daily maximum of each pollutant and a comparison to any limitation in § 423.13(l) or 423.16(j).

TABLE 1 TO PARAGRAPH (k)(2)(iv)

| BAT/PSES Treated Pollutants in Combustion Residual Leachate | |
|---|---|
| Antimony | Magnesium |
| Arsenic | Manganese |
| Barium | Mercury |
| Beryllium | Molybdenum |
| Cadmium | Nickel |
| Chromium | Thallium |
| Cobalt | Titanium |
| Copper | Vanadium |
| Lead | Zinc |

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erwise final is final for the purposes of this section whether or not there has been presented or determined an application for a declaratory order, for any form of reconsideration, or, unless the agency otherwise requires by rule and provides that the action meanwhile is inoperative, for an appeal to superior agency authority.

(Pub. L. 89–554, Sept. 6, 1966, 80 Stat. 392.)

HISTORICAL AND REVISION NOTES

| *Derivation* | *U.S. Code* | *Revised Statutes and Statutes at Large* |
|---|---|---|
| ..... | 5 U.S.C. 1009(c). | June 11, 1946, ch. 324, §10(c), 60 Stat. 243. |

Standard changes are made to conform with the definitions applicable and the style of this title as outlined in the preface of this report.

### § 705. Relief pending review

When an agency finds that justice so requires, it may postpone the effective date of action taken by it, pending judicial review. On such conditions as may be required and to the extent necessary to prevent irreparable injury, the reviewing court, including the court to which a case may be taken on appeal from or on application for certiorari or other writ to a reviewing court, may issue all necessary and appropriate process to postpone the effective date of an agency action or to preserve status or rights pending conclusion of the review proceedings.

(Pub. L. 89–554, Sept. 6, 1966, 80 Stat. 393.)

HISTORICAL AND REVISION NOTES

| *Derivation* | *U.S. Code* | *Revised Statutes and Statutes at Large* |
|---|---|---|
| ..... | 5 U.S.C. 1009(d). | June 11, 1946, ch. 324, §10(d), 60 Stat. 243. |

Standard changes are made to conform with the definitions applicable and the style of this title as outlined in the preface of this report.

### § 706. Scope of review

To the extent necessary to decision and when presented, the reviewing court shall decide all relevant questions of law, interpret constitutional and statutory provisions, and determine the meaning or applicability of the terms of an agency action. The reviewing court shall—

(1) compel agency action unlawfully withheld or unreasonably delayed; and

(2) hold unlawful and set aside agency action, findings, and conclusions found to be—

(A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law;

(B) contrary to constitutional right, power, privilege, or immunity;

(C) in excess of statutory jurisdiction, authority, or limitations, or short of statutory right;

(D) without observance of procedure required by law;

(E) unsupported by substantial evidence in a case subject to sections 556 and 557 of this title or otherwise reviewed on the record of an agency hearing provided by statute; or

(F) unwarranted by the facts to the extent that the facts are subject to trial de novo by the reviewing court.

In making the foregoing determinations, the court shall review the whole record or those parts of it cited by a party, and due account shall be taken of the rule of prejudicial error.

(Pub. L. 89–554, Sept. 6, 1966, 80 Stat. 393.)

HISTORICAL AND REVISION NOTES

| *Derivation* | *U.S. Code* | *Revised Statutes and Statutes at Large* |
|---|---|---|
| ..... | 5 U.S.C. 1009(e). | June 11, 1946, ch. 324, §10(e), 60 Stat. 243. |

Standard changes are made to conform with the definitions applicable and the style of this title as outlined in the preface of this report.

#### Statutory Notes and Related Subsidiaries

ABBREVIATION OF RECORD

Pub. L. 85–791, Aug. 28, 1958, 72 Stat. 941, which authorized abbreviation of record on review or enforcement of orders of administrative agencies and review on the original papers, provided, in section 35 thereof, that: ''This Act [see Tables for classification] shall not be construed to repeal or modify any provision of the Administrative Procedure Act [see Short Title note set out preceding section 551 of this title].''

## CHAPTER 8—CONGRESSIONAL REVIEW OF AGENCY RULEMAKING

Sec.
801. Congressional review.
802. Congressional disapproval procedure.
803. Special rule on statutory, regulatory, and judicial deadlines.
804. Definitions.
805. Judicial review.
806. Applicability; severability.
807. Exemption for monetary policy.
808. Effective date of certain rules.

### § 801. Congressional review

(a)(1)(A) Before a rule can take effect, the Federal agency promulgating such rule shall submit to each House of the Congress and to the Comptroller General a report containing—

(i) a copy of the rule;

(ii) a concise general statement relating to the rule, including whether it is a major rule; and

(iii) the proposed effective date of the rule.

(B) On the date of the submission of the report under subparagraph (A), the Federal agency promulgating the rule shall submit to the Comptroller General and make available to each House of Congress—

(i) a complete copy of the cost-benefit analysis of the rule, if any;

(ii) the agency's actions relevant to sections 603, 604, 605, 607, and 609;

(iii) the agency's actions relevant to sections 202, 203, 204, and 205 of the Unfunded Mandates Reform Act of 1995; and

(iv) any other relevant information or requirements under any other Act and any relevant Executive orders.

(C) Upon receipt of a report submitted under subparagraph (A), each House shall provide copies of the report to the chairman and ranking member of each standing committee with jurisdiction under the rules of the House of Rep-



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hear the case in banc or by means of a specially constituted court of appeals composed of the three circuit judges senior in commission who are able to sit. In case of disqualification or disability, the court shall be filled by designation and assignment as provided in chapter 15 of this title.

The provisions of section 29 of title 15, U.S.C., 1940 ed., and section 45 of title 49, U.S.C., 1940 ed., relating to time for appeal are incorporated in section 2101 of this title. The provisions of said sections for direct appeal to the Supreme Court are retained in said titles 15 and 49.

The second paragraph of the revised section is new. It recognizes the necessity of final disposition of litigation in which appellate review has been had and further review by the Supreme Court is impossible for lack of a quorum of qualified justices.

### [§ 2110. Repealed. Pub. L. 97–164, title I, § 136, Apr. 2, 1982, 96 Stat. 41]

Section, acts June 25, 1948, ch. 646, 62 Stat. 964; May 24, 1949, ch. 139, § 109, 63 Stat. 105, provided that appeals to the Court of Claims in tort claims cases, as provided in section 1504 of this title, be taken within 90 days after the entry of the final judgment of the district court.

#### Statutory Notes and Related Subsidiaries

EFFECTIVE DATE OF REPEAL

Repeal effective Oct. 1, 1982, see section 402 of Pub. L. 97–164, set out as an Effective Date of 1982 Amendment note under section 171 of this title.

### § 2111. Harmless error

On the hearing of any appeal or writ of certiorari in any case, the court shall give judgment after an examination of the record without regard to errors or defects which do not affect the substantial rights of the parties.

(Added May 24, 1949, ch. 139, § 110, 63 Stat. 105.)

HISTORICAL AND REVISION NOTES

1949 ACT

Incorporates in title 28, U.S.C., as section 2111 thereof, the harmless error provisions of section 269 of the Judicial Code (now repealed), which applied to all courts of the United States and to all cases therein and therefore was superseded only in part by the Federal Procedural Rules, which apply only to the United States district courts.

### § 2112. Record on review and enforcement of agency orders

(a) The rules prescribed under the authority of section 2072 of this title may provide for the time and manner of filing and the contents of the record in all proceedings instituted in the courts of appeals to enjoin, set aside, suspend, modify, or otherwise review or enforce orders of administrative agencies, boards, commissions, and officers. Such rules may authorize the agency, board, commission, or officer to file in the court a certified list of the materials comprising the record and retain and hold for the court all such materials and transmit the same or any part thereof to the court, when and as required by it, at any time prior to the final determination of the proceeding, and such filing of such certified list of the materials comprising the record and such subsequent transmittal of any such materials when and as required shall be deemed full compliance with any provision of law requiring the filing of the record in the court. The record in such proceedings shall be certified and filed in or held for and transmitted to the court of appeals by the agency, board, commission, or officer concerned within the time and in the manner prescribed by such rules. If proceedings are instituted in two or more courts of appeals with respect to the same order, the following shall apply:

(1) If within ten days after issuance of the order the agency, board, commission, or officer concerned receives, from the persons instituting the proceedings, the petition for review with respect to proceedings in at least two courts of appeals, the agency, board, commission, or officer shall proceed in accordance with paragraph (3) of this subsection. If within ten days after the issuance of the order the agency, board, commission, or officer concerned receives, from the persons instituting the proceedings, the petition for review with respect to proceedings in only one court of appeals, the agency, board, commission, or officer shall file the record in that court notwithstanding the institution in any other court of appeals of proceedings for review of that order. In all other cases in which proceedings have been instituted in two or more courts of appeals with respect to the same order, the agency, board, commission, or officer concerned shall file the record in the court in which proceedings with respect to the order were first instituted.

(2) For purposes of paragraph (1) of this subsection, a copy of the petition or other pleading which institutes proceedings in a court of appeals and which is stamped by the court with the date of filing shall constitute the petition for review. Each agency, board, commission, or officer, as the case may be, shall designate by rule the office and the officer who must receive petitions for review under paragraph (1).

(3) If an agency, board, commission, or officer receives two or more petitions for review of an order in accordance with the first sentence of paragraph (1) of this subsection, the agency, board, commission, or officer shall, promptly after the expiration of the ten-day period specified in that sentence, so notify the judicial panel on multidistrict litigation authorized by section 1407 of this title, in such form as that panel shall prescribe. The judicial panel on multidistrict litigation shall, by means of random selection, designate one court of appeals, from among the courts of appeals in which petitions for review have been filed and received within the ten-day period specified in the first sentence of paragraph (1), in which the record is to be filed, and shall issue an order consolidating the petitions for review in that court of appeals. The judicial panel on multidistrict litigation shall, after providing notice to the public and an opportunity for the submission of comments, prescribe rules with respect to the consolidation of proceedings under this paragraph. The agency, board, commission, or officer concerned shall file the record in the court of appeals designated pursuant to this paragraph.

(4) Any court of appeals in which proceedings with respect to an order of an agency,



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board, commission, or officer have been instituted may, to the extent authorized by law, stay the effective date of the order. Any such stay may thereafter be modified, revoked, or extended by a court of appeals designated pursuant to paragraph (3) with respect to that order or by any other court of appeals to which the proceedings are transferred.

(5) All courts in which proceedings are instituted with respect to the same order, other than the court in which the record is filed pursuant to this subsection, shall transfer those proceedings to the court in which the record is so filed. For the convenience of the parties in the interest of justice, the court in which the record is filed may thereafter transfer all the proceedings with respect to that order to any other court of appeals.

(b) The record to be filed in the court of appeals in such a proceeding shall consist of the order sought to be reviewed or enforced, the findings or report upon which it is based, and the pleadings, evidence, and proceedings before the agency, board, commission, or officer concerned, or such portions thereof (1) as the rules prescribed under the authority of section 2072 of this title may require to be included therein, or (2) as the agency, board, commission, or officer concerned, the petitioner for review or respondent in enforcement, as the case may be, and any intervenor in the court proceeding by written stipulation filed with the agency, board, commission, or officer concerned or in the court in any such proceeding may consistently with the rules prescribed under the authority of section 2072 of this title designate to be included therein, or (3) as the court upon motion of a party or, after a prehearing conference, upon its own motion may by order in any such proceeding designate to be included therein. Such a stipulation or order may provide in an appropriate case that no record need be filed in the court of appeals. If, however, the correctness of a finding of fact by the agency, board, commission, or officer is in question all of the evidence before the agency, board, commission, or officer shall be included in the record except such as the agency, board, commission, or officer concerned, the petitioner for review or respondent in enforcement, as the case may be, and any intervenor in the court proceeding by written stipulation filed with the agency, board, commission, or officer concerned or in the court agree to omit as wholly immaterial to the questioned finding. If there is omitted from the record any portion of the proceedings before the agency, board, commission, or officer which the court subsequently determines to be proper for it to consider to enable it to review or enforce the order in question the court may direct that such additional portion of the proceedings be filed as a supplement to the record. The agency, board, commission, or officer concerned may, at its option and without regard to the foregoing provisions of this subsection, and if so requested by the petitioner for review or respondent in enforcement shall, file in the court the entire record of the proceedings before it without abbreviation.

(c) The agency, board, commission, or officer concerned may transmit to the court of appeals the original papers comprising the whole or any part of the record or any supplemental record, otherwise true copies of such papers certified by an authorized officer or deputy of the agency, board, commission, or officer concerned shall be transmitted. Any original papers thus transmitted to the court of appeals shall be returned to the agency, board, commission, or officer concerned upon the final determination of the review or enforcement proceeding. Pending such final determination any such papers may be returned by the court temporarily to the custody of the agency, board, commission, or officer concerned if needed for the transaction of the public business. Certified copies of any papers included in the record or any supplemental record may also be returned to the agency, board, commission, or officer concerned upon the final determination of review or enforcement proceedings.

(d) The provisions of this section are not applicable to proceedings to review decisions of the Tax Court of the United States or to proceedings to review or enforce those orders of administrative agencies, boards, commissions, or officers which are by law reviewable or enforceable by the district courts.

(Added Pub. L. 85–791, §2, Aug. 28, 1958, 72 Stat. 941; amended Pub. L. 89–773, §5(a), (b), Nov. 6, 1966, 80 Stat. 1323; Pub. L. 100–236, §1, Jan. 8, 1988, 101 Stat. 1731.)

### Editorial Notes

#### AMENDMENTS

1988—Subsec. (a). Pub. L. 100–236 substituted ''If proceedings are instituted in two or more courts of appeals with respect to the same order, the following shall apply:'' and pars. (1) to (5) for ''If proceedings have been instituted in two or more courts of appeals with respect to the same order the agency, board, commission, or officer concerned shall file the record in that one of such courts in which a proceeding with respect to such order was first instituted. The other courts in which such proceedings are pending shall thereupon transfer them to the court of appeals in which the record has been filed. For the convenience of the parties in the interest of justice such court may thereafter transfer all the proceedings with respect to such order to any other court of appeals.''

1966—Subsec. (a). Pub. L. 89–773, §5(a), substituted ''The rules prescribed under the authority of section 2072 of this title may provide for the time and manner of filing'' for ''The several courts of appeal shall have power to adopt, with the approval of the Judicial Conference of the United States, rules, which so far as practicable shall be uniform in all such courts prescribing the time and manner of filing.'' See section 2072 of this title.

Subsec. (b). Pub. L. 89–773, §5(b), substituted ''the rules prescribed under the authority of section 2072 of this title'' for ''the said rules of the court of appeals'' and for ''the rules of such court''.

### Statutory Notes and Related Subsidiaries

#### EFFECTIVE DATE OF 1988 AMENDMENT

Pub. L. 100–236, §3, Jan. 8, 1988, 101 Stat. 1732, provided that: ''The amendments made by this Act [amending this section and section 1369 of Title 33, Navigation and Navigable Waters] take effect 180 days after the date of the enactment of this Act [Jan 8, 1988], except that the judicial panel on multidistrict litigation may issue rules pursuant to subsection (a)(3) of section 2112 of title 28, United States Code (as added by section 1), on or after such date of enactment.''



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(5) a description of existing challenges concerning the use of new and emerging, but proven, stormwater control infrastructure.

**(e) Authorization of appropriations**

**(1) In general**

There is authorized to be appropriated to carry out this section (except for subsection (b)) $10,000,000 for each of fiscal years 2022 through 2026.

**(2) Limitation on use of funds**

Of the amounts made available for grants under paragraph (1), not more than 2 percent may be used to pay the administrative costs of the Administrator.

(Pub. L. 117–58, div. E, title II, § 50217, Nov. 15, 2021, 135 Stat. 1175.)

**Editorial Notes**

CODIFICATION

Section was enacted as part of the Drinking Water and Wastewater Infrastructure Act of 2021 and also as part of the Infrastructure Investment and Jobs Act, and not as part of the Federal Water Pollution Control Act which comprises this chapter.

**Statutory Notes and Related Subsidiaries**

''ADMINISTRATOR'' DEFINED

Administrator means the Administrator of the Environmental Protection Agency, see section 50002 of Pub. L. 117–58, set out as a note under section 300j–18a of Title 42, The Public Health and Welfare.

## SUBCHAPTER III—STANDARDS AND ENFORCEMENT

### § 1311. Effluent limitations

**(a) Illegality of pollutant discharges except in compliance with law**

Except as in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title, the discharge of any pollutant by any person shall be unlawful.

**(b) Timetable for achievement of objectives**

In order to carry out the objective of this chapter there shall be achieved—

(1)(A) not later than July 1, 1977, effluent limitations for point sources, other than publicly owned treatment works, (i) which shall require the application of the best practicable control technology currently available as defined by the Administrator pursuant to section 1314(b) of this title, or (ii) in the case of a discharge into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, which shall require compliance with any applicable pretreatment requirements and any requirements under section 1317 of this title; and

(B) for publicly owned treatment works in existence on July 1, 1977, or approved pursuant to section 1283 of this title prior to June 30, 1974 (for which construction must be completed within four years of approval), effluent limitations based upon secondary treatment as defined by the Administrator pursuant to section 1314(d)(1) of this title; or,

(C) not later than July 1, 1977, any more stringent limitation, including those necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations (under authority preserved by section 1370 of this title) or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to this chapter.

(2)(A) for pollutants identified in subparagraphs (C), (D), and (F) of this paragraph, effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which (i) shall require application of the best available technology economically achievable for such category or class, which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(2) of this title, which such effluent limitations shall require the elimination of discharges of all pollutants if the Administrator finds, on the basis of information available to him (including information developed pursuant to section 1325 of this title), that such elimination is technologically and economically achievable for a category or class of point sources as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(2) of this title, or (ii) in the case of the introduction of a pollutant into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, shall require compliance with any applicable pretreatment requirements and any other requirement under section 1317 of this title;

(B) Repealed. Pub. L. 97–117, § 21(b), Dec. 29, 1981, 95 Stat. 1632.

(C) with respect to all toxic pollutants referred to in table 1 of Committee Print Numbered 95–30 of the Committee on Public Works and Transportation of the House of Representatives compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989;

(D) for all toxic pollutants listed under paragraph (1) of subsection (a) of section 1317 of this title which are not referred to in subparagraph (C) of this paragraph compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable, but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989;

(E) as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989, compliance with effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which in the case of pollutants identified pursuant to section 1314(a)(4) of this title



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shall require application of the best conventional pollutant control technology as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(4) of this title; and

(F) for all pollutants (other than those subject to subparagraphs (C), (D), or (E) of this paragraph) compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than 3 years after the date such limitations are established, and in no case later than March 31, 1989.

(3)(A) for effluent limitations under paragraph (1)(A)(i) of this subsection promulgated after January 1, 1982, and requiring a level of control substantially greater or based on fundamentally different control technology than under permits for an industrial category issued before such date, compliance as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989; and

(B) for any effluent limitation in accordance with paragraph (1)(A)(i), (2)(A)(i), or (2)(E) of this subsection established only on the basis of section 1342(a)(1) of this title in a permit issued after February 4, 1987, compliance as expeditiously as practicable but in no case later than three years after the date such limitations are established, and in no case later than March 31, 1989.

**(c) Modification of timetable**

The Administrator may modify the requirements of subsection (b)(2)(A) of this section with respect to any point source for which a permit application is filed after July 1, 1977, upon a showing by the owner or operator of such point source satisfactory to the Administrator that such modified requirements (1) will represent the maximum use of technology within the economic capability of the owner or operator; and (2) will result in reasonable further progress toward the elimination of the discharge of pollutants.

**(d) Review and revision of effluent limitations**

Any effluent limitation required by paragraph (2) of subsection (b) of this section shall be reviewed at least every five years and, if appropriate, revised pursuant to the procedure established under such paragraph.

**(e) All point discharge source application of effluent limitations**

Effluent limitations established pursuant to this section or section 1312 of this title shall be applied to all point sources of discharge of pollutants in accordance with the provisions of this chapter.

**(f) Illegality of discharge of radiological, chemical, or biological warfare agents, high-level radioactive waste, or medical waste**

Notwithstanding any other provisions of this chapter it shall be unlawful to discharge any radiological, chemical, or biological warfare agent, any high-level radioactive waste, or any medical waste, into the navigable waters.

**(g) Modifications for certain nonconventional pollutants**

**(1) General authority**

The Administrator, with the concurrence of the State, may modify the requirements of subsection (b)(2)(A) of this section with respect to the discharge from any point source of ammonia, chlorine, color, iron, and total phenols (4AAP) (when determined by the Administrator to be a pollutant covered by subsection (b)(2)(F)) and any other pollutant which the Administrator lists under paragraph (4) of this subsection.

**(2) Requirements for granting modifications**

A modification under this subsection shall be granted only upon a showing by the owner or operator of a point source satisfactory to the Administrator that—

(A) such modified requirements will result at a minimum in compliance with the requirements of subsection (b)(1)(A) or (C) of this section, whichever is applicable;

(B) such modified requirements will not result in any additional requirements on any other point or nonpoint source; and

(C) such modification will not interfere with the attainment or maintenance of that water quality which shall assure protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities, in and on the water and such modification will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistency in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity or teratogenicity), or synergistic propensities.

**(3) Limitation on authority to apply for subsection (c) modification**

If an owner or operator of a point source applies for a modification under this subsection with respect to the discharge of any pollutant, such owner or operator shall be eligible to apply for modification under subsection (c) of this section with respect to such pollutant only during the same time period as he is eligible to apply for a modification under this subsection.

**(4) Procedures for listing additional pollutants**

**(A) General authority**

Upon petition of any person, the Administrator may add any pollutant to the list of pollutants for which modification under this section is authorized (except for pollutants identified pursuant to section 1314(a)(4) of this title, toxic pollutants subject to section 1317(a) of this title, and the thermal component of discharges) in accordance with the provisions of this paragraph.

**(B) Requirements for listing**

**(i) Sufficient information**

The person petitioning for listing of an additional pollutant under this subsection



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| ''Category | Date by which the final regulation shall be promulgated |
|---|---|
| Organic chemicals and plastics and synthetic fibers | December 31, 1986. |
| Pesticides | December 31, 1986.'' |

PHOSPHATE FERTILIZER EFFLUENT LIMITATION

Amendment by section 306(a), (b) of Pub. L. 100–4 not to be construed (A) to require the Administrator to permit the discharge of gypsum or gypsum waste into the navigable waters, (B) to affect the procedures and standards applicable to the Administrator in issuing permits under section 1342(a)(1)(B) of this title, and (C) to affect the authority of any State to deny or condition certification under section 1314 of this title with respect to the issuance of permits under section 1342(a)(1)(B) of this title, see section 306(c) of Pub. L. 100–4, set out as a note under section 1342 of this title.

DISCHARGES FROM POINT SOURCES IN UNITED STATES VIRGIN ISLANDS ATTRIBUTABLE TO MANUFACTURE OF RUM; EXEMPTION FROM FEDERAL WATER POLLUTION CONTROL REQUIREMENTS; CONDITIONS

Pub. L. 98–67, title II, § 214(g), Aug. 5, 1983, 97 Stat. 393, as amended by Pub. L. 99–514, § 2, Oct. 22, 1986, 100 Stat. 2095, provided that: ''Any discharge from a point source in the United States Virgin Islands in existence on the date of the enactment of this subsection [Aug. 5, 1983] which discharge is attributable to the manufacture of rum (as defined in paragraphs (3) of section 7652(c) of the Internal Revenue Code of 1986 [formerly I.R.C. 1954]) [26 U.S.C. 7652(c)(3)] shall not be subject to the requirements of section 301 (other than toxic pollutant discharges), section 306 or section 403 of the Federal Water Pollution Control Act [33 U.S.C. 1311, 1316, 1343] if—

''(1) such discharge occurs at least one thousand five hundred feet into the territorial sea from the line of ordinary low water from that portion of the coast which is in direct contact with the sea, and

''(2) the Governor of the United States Virgin Islands determines that such discharge will not interfere with the attainment or maintenance of that water quality which shall assure protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities, in and on the water and will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistency in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity, or teratogenicity), or synergistic propensities.''

CERTAIN MUNICIPAL COMPLIANCE DEADLINES UNAFFECTED; EXCEPTION

Pub. L. 97–117, § 21(a), Dec. 29, 1981, 95 Stat. 1631, provided in part that: ''The amendment made by this subsection [amending this section] shall not be interpreted or applied to extend the date for compliance with section 301(b)(1)(B) or (C) of the Federal Water Pollution Control Act [33 U.S.C. 1311(b)(1)(B), (C)] beyond schedules for compliance in effect as of the date of enactment of this Act [Dec. 29, 1981], except in cases where reductions in the amount of financial assistance under this Act [Pub. L. 97–117, see Short Title of 1981 Amendment note set out under section 1251 of this title] or changed conditions affecting the rate of construction beyond the control of the owner or operator will make it impossible to complete construction by July 1, 1983.''

**Executive Documents**

TERRITORIAL SEA AND CONTIGUOUS ZONE OF UNITED STATES

For extension of territorial sea and contiguous zone of United States, see Proc. No. 5928 and Proc. No. 7219, respectively, set out as notes under section 1331 of Title 43, Public Lands.

## § 1312. Water quality related effluent limitations

### (a) Establishment

Whenever, in the judgment of the Administrator or as identified under section 1314(*l*) of this title, discharges of pollutants from a point source or group of point sources, with the application of effluent limitations required under section 1311(b)(2) of this title, would interfere with the attainment or maintenance of that water quality in a specific portion of the navigable waters which shall assure protection of public health, public water supplies, agricultural and industrial uses, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and allow recreational activities in and on the water, effluent limitations (including alternative effluent control strategies) for such point source or sources shall be established which can reasonably be expected to contribute to the attainment or maintenance of such water quality.

### (b) Modifications of effluent limitations

#### (1) Notice and hearing

Prior to establishment of any effluent limitation pursuant to subsection (a) of this section, the Administrator shall publish such proposed limitation and within 90 days of such publication hold a public hearing.

#### (2) Permits

##### (A) No reasonable relationship

The Administrator, with the concurrence of the State, may issue a permit which modifies the effluent limitations required by subsection (a) of this section for pollutants other than toxic pollutants if the applicant demonstrates at such hearing that (whether or not technology or other alternative control strategies are available) there is no reasonable relationship between the economic and social costs and the benefits to be obtained (including attainment of the objective of this chapter) from achieving such limitation.

##### (B) Reasonable progress

The Administrator, with the concurrence of the State, may issue a permit which modifies the effluent limitations required by subsection (a) of this section for toxic pollutants for a single period not to exceed 5 years if the applicant demonstrates to the satisfaction of the Administrator that such modified requirements (i) will represent the maximum degree of control within the economic capability of the owner and operator of the source, and (ii) will result in reasonable further progress beyond the requirements of section 1311(b)(2) of this title toward the requirements of subsection (a) of this section.

### (c) Delay in application of other limitations

The establishment of effluent limitations under this section shall not operate to delay the application of any effluent limitation established under section 1311 of this title.

(June 30, 1948, ch. 758, title III, § 302, as added Pub. L. 92–500, § 2, Oct. 18, 1972, 86 Stat. 846;



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1314(a)(9) of this title, each State having coastal recreation waters shall adopt and submit to the Administrator new or revised water quality standards for the coastal recreation waters of the State for all pathogens and pathogen indicators to which the new or revised water quality criteria are applicable.

**(2) Failure of States to adopt**

**(A) In general**

If a State fails to adopt water quality criteria and standards in accordance with paragraph (1)(A) that are as protective of human health as the criteria for pathogens and pathogen indicators for coastal recreation waters published by the Administrator, the Administrator shall promptly propose regulations for the State setting forth revised or new water quality standards for pathogens and pathogen indicators described in paragraph (1)(A) for coastal recreation waters of the State.

**(B) Exception**

If the Administrator proposes regulations for a State described in subparagraph (A) under subsection (c)(4)(B), the Administrator shall publish any revised or new standard under this subsection not later than 42 months after October 10, 2000.

**(3) Applicability**

Except as expressly provided by this subsection, the requirements and procedures of subsection (c) apply to this subsection, including the requirement in subsection (c)(2)(A) that the criteria protect public health and welfare.

(June 30, 1948, ch. 758, title III, § 303, as added Pub. L. 92–500, § 2, Oct. 18, 1972, 86 Stat. 846; amended Pub. L. 100–4, title III, § 308(d), title IV, § 404(b), Feb. 4, 1987, 101 Stat. 39, 68; Pub. L. 106–284, § 2, Oct. 10, 2000, 114 Stat. 870.)

**Editorial Notes**

REFERENCES IN TEXT

This Act, referred to in subsecs. (a)(1), (2), (3)(B), (C) and (b)(1), means act June 30, 1948, ch. 758, 62 Stat. 1155, prior to the supersedure and reenactment of act June 30, 1948 by act Oct. 18, 1972, Pub. L. 92–500, 86 Stat. 816. Act June 30, 1948, ch. 758, as added by act Oct. 18, 1972, Pub. L. 92–500, 86 Stat. 816, enacted this chapter.

AMENDMENTS

2000—Subsec. (i). Pub. L. 106–284 added subsec. (i).

1987—Subsec. (c)(2). Pub. L. 100–4, § 308(d), designated existing provision as subpar. (A) and added subpar. (B).

Subsec. (d)(4). Pub. L. 100–4, § 404(b), added par. (4).

### § 1313a. Revised water quality standards

The review, revision, and adoption or promulgation of revised or new water quality standards pursuant to section 303(c) of the Federal Water Pollution Control Act [33 U.S.C. 1313(c)] shall be completed by the date three years after December 29, 1981. No grant shall be made under title II of the Federal Water Pollution Control Act [33 U.S.C. 1281 et seq.] after such date until water quality standards are reviewed and revised pursuant to section 303(c), except where the State has in good faith submitted such revised water quality standards and the Administrator has not acted to approve or disapprove such submission within one hundred and twenty days of receipt.

(Pub. L. 97–117, § 24, Dec. 29, 1981, 95 Stat. 1632.)

**Editorial Notes**

REFERENCES IN TEXT

The Federal Water Pollution Control Act, referred to in text, is act June 30, 1948, ch. 758, as amended generally by Pub. L. 92–500, § 2, Oct. 18, 1972, 86 Stat. 816. Title II of the Act is classified generally to subchapter II (§ 1281 et seq.) of this chapter. For complete classification of this Act to the Code, see Short Title note set out under section 1251 of this title and Tables.

CODIFICATION

Section was enacted as part of the Municipal Wastewater Treatment Construction Grant Amendments of 1981, and not as part of the Federal Water Pollution Control Act which comprises this chapter.

### § 1314. Information and guidelines

**(a) Criteria development and publication**

(1) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after October 18, 1972 (and from time to time thereafter revise) criteria for water quality accurately reflecting the latest scientific knowledge (A) on the kind and extent of all identifiable effects on health and welfare including, but not limited to, plankton, fish, shellfish, wildlife, plant life, shorelines, beaches, esthetics, and recreation which may be expected from the presence of pollutants in any body of water, including ground water; (B) on the concentration and dispersal of pollutants, or their byproducts, through biological, physical, and chemical processes; and (C) on the effects of pollutants on biological community diversity, productivity, and stability, including information on the factors affecting rates of eutrophication and rates of organic and inorganic sedimentation for varying types of receiving waters.

(2) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after October 18, 1972 (and from time to time thereafter revise) information (A) on the factors necessary to restore and maintain the chemical, physical, and biological integrity of all navigable waters, ground waters, waters of the contiguous zone, and the oceans; (B) on the factors necessary for the protection and propagation of shellfish, fish, and wildlife for classes and categories of receiving waters and to allow recreational activities in and on the water; and (C) on the measurement and classification of water quality; and (D) for the purpose of section 1313 of this title, on and the identification of pollutants suitable for maximum daily load measurement correlated with the achievement of water quality objectives.

(3) Such criteria and information and revisions thereof shall be issued to the States and shall be published in the Federal Register and otherwise made available to the public.

(4) The Administrator shall, within 90 days after December 27, 1977, and from time to time



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thereafter, publish and revise as appropriate information identifying conventional pollutants, including but not limited to, pollutants classified as biological oxygen demanding, suspended solids, fecal coliform, and pH. The thermal component of any discharge shall not be identified as a conventional pollutant under this paragraph.

(5)(A) The Administrator, to the extent practicable before consideration of any request under section 1311(g) of this title and within six months after December 27, 1977, shall develop and publish information on the factors necessary for the protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and to allow recreational activities, in and on the water.

(B) The Administrator, to the extent practicable before consideration of any application under section 1311(h) of this title and within six months after December 27, 1977, shall develop and publish information on the factors necessary for the protection of public water supplies, and the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife, and to allow recreational activities, in and on the water.

(6) The Administrator shall, within three months after December 27, 1977, and annually thereafter, for purposes of section 1311(h) of this title publish and revise as appropriate information identifying each water quality standard in effect under this chapter or State law, the specific pollutants associated with such water quality standard, and the particular waters to which such water quality standard applies.

(7) GUIDANCE TO STATES.—The Administrator, after consultation with appropriate State agencies and on the basis of criteria and information published under paragraphs (1) and (2) of this subsection, shall develop and publish, within 9 months after February 4, 1987, guidance to the States on performing the identification required by subsection (*l*)(1) of this section.

(8) INFORMATION ON WATER QUALITY CRITERIA.—The Administrator, after consultation with appropriate State agencies and within 2 years after February 4, 1987, shall develop and publish information on methods for establishing and measuring water quality criteria for toxic pollutants on other bases than pollutant-by-pollutant criteria, including biological monitoring and assessment methods.

(9) REVISED CRITERIA FOR COASTAL RECREATION WATERS.—

(A) IN GENERAL.—Not later than 5 years after October 10, 2000, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), the Administrator shall publish new or revised water quality criteria for pathogens and pathogen indicators (including a revised list of testing methods, as appropriate), based on the results of the studies conducted under section 1254(v) of this title, for the purpose of protecting human health in coastal recreation waters.

(B) REVIEWS.—Not later than the date that is 5 years after the date of publication of water quality criteria under this paragraph, and at least once every 5 years thereafter, the Administrator shall review and, as necessary, revise the water quality criteria.

**(b) Effluent limitation guidelines**

For the purpose of adopting or revising effluent limitations under this chapter the Administrator shall, after consultation with appropriate Federal and State agencies and other interested persons, publish within one year of October 18, 1972, regulations, providing guidelines for effluent limitations, and, at least annually thereafter, revise, if appropriate, such regulations. Such regulations shall—

(1)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best practicable control technology currently available for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the control measures and practices to be applicable to point sources (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best practicable control technology currently available to comply with subsection (b)(1) of section 1311 of this title shall include consideration of the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, and shall also take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, nonwater quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate;

(2)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods, and other alternatives for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the best measures and practices available to comply with subsection (b)(2) of section 1311 of this title to be applicable to any point source (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best available technology shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate;

(3) identify control measures and practices available to eliminate the discharge of pollutants from categories and classes of point



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sources, taking into account the cost of achieving such elimination of the discharge of pollutants; and

(4)(A) identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, the degree of effluent reduction attainable through the application of the best conventional pollutant control technology (including measures and practices) for classes and categories of point sources (other than publicly owned treatment works); and

(B) specify factors to be taken into account in determining the best conventional pollutant control technology measures and practices to comply with section 1311(b)(2)(E) of this title to be applicable to any point source (other than publicly owned treatment works) within such categories or classes. Factors relating to the assessment of best conventional pollutant control technology (including measures and practices) shall include consideration of the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived, and the comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources, and shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate.

**(c) Pollution discharge elimination procedures**

The Administrator, after consultation, with appropriate Federal and State agencies and other interested persons, shall issue to the States and appropriate water pollution control agencies within 270 days after October 18, 1972 (and from time to time thereafter) information on the processes, procedures, or operating methods which result in the elimination or reduction of the discharge of pollutants to implement standards of performance under section 1316 of this title. Such information shall include technical and other data, including costs, as are available on alternative methods of elimination or reduction of the discharge of pollutants. Such information, and revisions thereof, shall be published in the Federal Register and otherwise shall be made available to the public.

**(d) Secondary treatment information; alternative waste treatment management techniques; innovative and alternative wastewater treatment processes; facilities deemed equivalent of secondary treatment**

(1) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall publish within sixty days after October 18, 1972 (and from time to time thereafter) information, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, on the degree of effluent reduction attainable through the application of secondary treatment.

(2) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall publish within nine months after October 18, 1972 (and from time to time thereafter) information on alternative waste treatment management techniques and systems available to implement section 1281 of this title.

(3) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall promulgate within one hundred and eighty days after December 27, 1977, guidelines for identifying and evaluating innovative and alternative wastewater treatment processes and techniques referred to in section 1281(g)(5) of this title.

(4) For the purposes of this subsection, such biological treatment facilities as oxidation ponds, lagoons, and ditches and trickling filters shall be deemed the equivalent of secondary treatment. The Administrator shall provide guidance under paragraph (1) of this subsection on design criteria for such facilities, taking into account pollutant removal efficiencies and, consistent with the objectives of this chapter, assuring that water quality will not be adversely affected by deeming such facilities as the equivalent of secondary treatment.

**(e) Best management practices for industry**

The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, may publish regulations, supplemental to any effluent limitations specified under subsections (b) and (c) of this section for a class or category of point sources, for any specific pollutant which the Administrator is charged with a duty to regulate as a toxic or hazardous pollutant under section 1317(a)(1) or 1321 of this title, to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage which the Administrator determines are associated with or ancillary to the industrial manufacturing or treatment process within such class or category of point sources and may contribute significant amounts of such pollutants to navigable waters. Any applicable controls established under this subsection shall be included as a requirement for the purposes of section 1311, 1312, 1316, 1317, or 1343 of this title, as the case may be, in any permit issued to a point source pursuant to section 1342 of this title.

**(f) Identification and evaluation of nonpoint sources of pollution; processes, procedures, and methods to control pollution**

The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall issue to appropriate Federal agencies, the States, water pollution control agencies, and agencies designated under section 1288 of this title, within one year after October 18, 1972 (and from time to time thereafter) information including (1) guidelines for identifying and evaluating the nature and extent of nonpoint sources of pollutants, and (2) processes, procedures, and methods to control pollution resulting from—

(A) agricultural and silvicultural activities, including runoff from fields and crop and forest lands;



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(B) mining activities, including runoff and siltation from new, currently operating, and abandoned surface and underground mines;

(C) all construction activity, including runoff from the facilities resulting from such construction;

(D) the disposal of pollutants in wells or in subsurface excavations;

(E) salt water intrusion resulting from reductions of fresh water flow from any cause, including extraction of ground water, irrigation, obstruction, and diversion; and

(F) changes in the movement, flow, or circulation of any navigable waters or ground waters, including changes caused by the construction of dams, levees, channels, causeways, or flow diversion facilities.

Such information and revisions thereof shall be published in the Federal Register and otherwise made available to the public.

**(g) Guidelines for pretreatment of pollutants**

(1) For the purpose of assisting States in carrying out programs under section 1342 of this title, the Administrator shall publish, within one hundred and twenty days after October 18, 1972, and review at least annually thereafter and, if appropriate, revise guidelines for pretreatment of pollutants which he determines are not susceptible to treatment by publicly owned treatment works. Guidelines under this subsection shall be established to control and prevent the discharge into the navigable waters, the contiguous zone, or the ocean (either directly or through publicly owned treatment works) of any pollutant which interferes with, passes through, or otherwise is incompatible with such works.

(2) When publishing guidelines under this subsection, the Administrator shall designate the category or categories of treatment works to which the guidelines shall apply.

**(h) Test procedures guidelines**

The Administrator shall, within one hundred and eighty days from October 18, 1972, promulgate guidelines establishing test procedures for the analysis of pollutants that shall include the factors which must be provided in any certification pursuant to section 1341 of this title or permit application pursuant to section 1342 of this title.

**(i) Guidelines for monitoring, reporting, enforcement, funding, personnel, and manpower**

The Administrator shall (1) within sixty days after October 18, 1972, promulgate guidelines for the purpose of establishing uniform application forms and other minimum requirements for the acquisition of information from owners and operators of point-sources of discharge subject to any State program under section 1342 of this title, and (2) within sixty days from October 18, 1972, promulgate guidelines establishing the minimum procedural and other elements of any State program under section 1342 of this title, which shall include:

(A) monitoring requirements;

(B) reporting requirements (including procedures to make information available to the public);

(C) enforcement provisions; and

(D) funding, personnel qualifications, and manpower requirements (including a requirement that no board or body which approves permit applications or portions thereof shall include, as a member, any person who receives, or has during the previous two years received, a significant portion of his income directly or indirectly from permit holders or applicants for a permit).

**(j) Lake restoration guidance manual**

The Administrator shall, within 1 year after February 4, 1987, and biennially thereafter, publish and disseminate a lake restoration guidance manual describing methods, procedures, and processes to guide State and local efforts to improve, restore, and enhance water quality in the Nation's publicly owned lakes.

**(k) Agreements with Secretaries of Agriculture, Army, and the Interior to provide maximum utilization of programs to achieve and maintain water quality; transfer of funds; authorization of appropriations**

(1) The Administrator shall enter into agreements with the Secretary of Agriculture, the Secretary of the Army, and the Secretary of the Interior, and the heads of such other departments, agencies, and instrumentalities of the United States as the Administrator determines, to provide for the maximum utilization of other Federal laws and programs for the purpose of achieving and maintaining water quality through appropriate implementation of plans approved under section 1288 of this title and nonpoint source pollution management programs approved under section 1329 of this title.

(2) The Administrator is authorized to transfer to the Secretary of Agriculture, the Secretary of the Army, and the Secretary of the Interior and the heads of such other departments, agencies, and instrumentalities of the United States as the Administrator determines, any funds appropriated under paragraph (3) of this subsection to supplement funds otherwise appropriated to programs authorized pursuant to any agreement under paragraph (1).

(3) There is authorized to be appropriated to carry out the provisions of this subsection, $100,000,000 per fiscal year for the fiscal years 1979 through 1983 and such sums as may be necessary for fiscal years 1984 through 1990.

***(l)* Individual control strategies for toxic pollutants**

**(1) State list of navigable waters and development of strategies**

Not later than 2 years after February 4, 1987, each State shall submit to the Administrator for review, approval, and implementation under this subsection—

(A) a list of those waters within the State which after the application of effluent limitations required under section 1311(b)(2) of this title cannot reasonably be anticipated to attain or maintain (i) water quality standards for such waters reviewed, revised, or adopted in accordance with section 1313(c)(2)(B) of this title, due to toxic pollutants, or (ii) that water quality which shall assure protection of public health, public water supplies, agricultural and industrial



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uses, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and allow recreational activities in and on the water;

(B) a list of all navigable waters in such State for which the State does not expect the applicable standard under section 1313 of this title will be achieved after the requirements of sections 1311(b), 1316, and 1317(b) of this title are met, due entirely or substantially to discharges from point sources of any toxic pollutants listed pursuant to section 1317(a) of this title;

(C) for each segment of the navigable waters included on such lists, a determination of the specific point sources discharging any such toxic pollutant which is believed to be preventing or impairing such water quality and the amount of each such toxic pollutant discharged by each such source; and

(D) for each such segment, an individual control strategy which the State determines will produce a reduction in the discharge of toxic pollutants from point sources identified by the State under this paragraph through the establishment of effluent limitations under section 1342 of this title and water quality standards under section 1313(c)(2)(B) of this title, which reduction is sufficient, in combination with existing controls on point and nonpoint sources of pollution, to achieve the applicable water quality standard as soon as possible, but not later than 3 years after the date of the establishment of such strategy.

**(2) Approval or disapproval**

Not later than 120 days after the last day of the 2-year period referred to in paragraph (1), the Administrator shall approve or disapprove the control strategies submitted under paragraph (1) by any State.

**(3) Administrator's action**

If a State fails to submit control strategies in accordance with paragraph (1) or the Administrator does not approve the control strategies submitted by such State in accordance with paragraph (1), then, not later than 1 year after the last day of the period referred to in paragraph (2), the Administrator, in cooperation with such State and after notice and opportunity for public comment, shall implement the requirements of paragraph (1) in such State. In the implementation of such requirements, the Administrator shall, at a minimum, consider for listing under this subsection any navigable waters for which any person submits a petition to the Administrator for listing not later than 120 days after such last day.

**(m) Schedule for review of guidelines**

**(1) Publication**

Within 12 months after February 4, 1987, and biennially thereafter, the Administrator shall publish in the Federal Register a plan which shall—

(A) establish a schedule for the annual review and revision of promulgated effluent guidelines, in accordance with subsection (b) of this section;

(B) identify categories of sources discharging toxic or nonconventional pollutants for which guidelines under subsection (b)(2) of this section and section 1316 of this title have not previously been published; and

(C) establish a schedule for promulgation of effluent guidelines for categories identified in subparagraph (B), under which promulgation of such guidelines shall be no later than 4 years after February 4, 1987, for categories identified in the first published plan or 3 years after the publication of the plan for categories identified in later published plans.

**(2) Public review**

The Administrator shall provide for public review and comment on the plan prior to final publication.

(June 30, 1948, ch. 758, title III, § 304, as added Pub. L. 92–500, § 2, Oct. 18, 1972, 86 Stat. 850; amended Pub. L. 95–217, §§ 48–51, 62(b), Dec. 27, 1977, 91 Stat. 1587, 1588, 1598; Pub. L. 97–117, § 23, Dec. 29, 1981, 95 Stat. 1632; Pub. L. 100–4, title I, § 101(f), title III, §§ 308(a), (c), (f), 315(c), 316(e), Feb. 4, 1987, 101 Stat. 9, 38–40, 52, 61; Pub. L. 106–284, § 3(b), Oct. 10, 2000, 114 Stat. 871.)

**Editorial Notes**

CODIFICATION

Pub. L. 95–217, § 50, Dec. 27, 1977, 91 Stat. 1588, provided in part that, upon the enactment of subsec. (e) of this section by Pub. L. 95–217 and the concurrent redesignation of former subsecs. (e) to (j) of this section as (f) to (k), respectively, all references to former subsecs. (e) to (j) be changed to (f) to (k), respectively.

AMENDMENTS

2000—Subsec. (a)(9). Pub. L. 106–284 added par. (9).

1987—Subsec. (a)(7), (8). Pub. L. 100–4, § 308(c), added pars. (7) and (8).

Subsec. (j). Pub. L. 100–4, § 315(c), amended subsec. (j) generally. Prior to amendment, subsec. (j) read as follows: ''The Administrator shall issue information biennially on methods, procedures, and processes as may be appropriate to restore and enhance the quality of the Nation's publicly owned freshwater lakes.''

Subsec. (k)(1). Pub. L. 100–4, § 316(e), inserted ''and nonpoint source pollution management programs approved under section 1329 of this title'' before period at end.

Subsec. (k)(3). Pub. L. 100–4, § 101(f), inserted ''and such sums as may be necessary for fiscal years 1984 through 1990'' after ''1983''.

Subsec. (*l*). Pub. L. 100–4, § 308(a), added subsec. (*l*).

Subsec. (m). Pub. L. 100–4, § 308(f), added subsec. (m).

1981—Subsec. (d)(4). Pub. L. 97–117 added par. (4).

1977—Subsec. (a)(4) to (6). Pub. L. 95–217, § 48(a), added pars. (4) to (6).

Subsec. (b)(4). Pub. L. 95–217, § 48(b), added par. (4).

Subsec. (d)(3). Pub. L. 95–217, § 49, added par. (3).

Subsecs. (e) to (i). Pub. L. 95–217, § 50, added subsec. (e) and redesignated former subsecs. (e) to (h) as (f) to (i), respectively. Former subsec. (i) redesignated (j).

Subsec. (j). Pub. L. 95–217, §§ 50, 62(b), redesignated former subsec. (i) as (j) and substituted ''shall issue information biennially on methods'' for ''shall, within 270 days after October 18, 1972 (and from time to time thereafter), issue such information on methods''. Former subsec. (j) redesignated (k).

Subsec. (k). Pub. L. 95–217, §§ 50, 51, redesignated former subsec. (j) as (k), substituted ''The Administrator shall enter into agreements with the Secretary of Agriculture, the Secretary of the Army, and the Secretary of the Interior, and the heads of such other de-



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(C) an analysis of the extent to which the elimination of the discharge of pollutants and a level of water quality which provides for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allows recreational activities in and on the water, have been or will be achieved by the requirements of this chapter, together with recommendations as to additional action necessary to achieve such objectives and for what waters such additional action is necessary;

(D) an estimate of (i) the environmental impact, (ii) the economic and social costs necessary to achieve the objective of this chapter in such State, (iii) the economic and social benefits of such achievement, and (iv) an estimate of the date of such achievement; and

(E) a description of the nature and extent of nonpoint sources of pollutants, and recommendations as to the programs which must be undertaken to control each category of such sources, including an estimate of the costs of implementing such programs.

(2) The Administrator shall transmit such State reports, together with an analysis thereof, to Congress on or before October 1, 1975, and October 1, 1976, and biennially thereafter.

(June 30, 1948, ch. 758, title III, § 305, as added Pub. L. 92–500, § 2, Oct. 18, 1972, 86 Stat. 853; amended Pub. L. 95–217, § 52, Dec. 27, 1977, 91 Stat. 1589.)

**Editorial Notes**

CODIFICATION

Subsec. (a) authorized the Administrator, in cooperation with the States and Federal agencies, to prepare a report describing the specific quality, during 1973, of all navigable waters and waters of the contiguous zone, including an inventory of all point sources of discharge of pollutants into these waters, and identifying those navigable waters capable of supporting fish and wildlife populations and allowing recreational activities, those which could reasonably be expected to attain this level by 1977 or 1983, and those which could attain this level sooner, and submit this report to Congress on or before Jan. 1, 1974.

AMENDMENTS

1977—Subsec. (b)(1). Pub. L. 95–217, § 52(1), substituted ''April 1, 1975, and shall bring up to date by April 1, 1976, and biennially thereafter'' for ''January 1, 1975, and shall bring up to date each year thereafter'' in provisions preceding subpar. (A).

Subsec. (b)(2). Pub. L. 95–217, § 52(2), substituted ''on or before October 1, 1975, and October 1, 1976, and biennially thereafter'' for ''on or before October 1, 1975, and annually thereafter''.

## § 1316. National standards of performance

### (a) Definitions

For purposes of this section:

(1) The term ''standard of performance'' means a standard for the control of the discharge of pollutants which reflects the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants.

(2) The term ''new source'' means any source, the construction of which is commenced after the publication of proposed regulations prescribing a standard of performance under this section which will be applicable to such source, if such standard is thereafter promulgated in accordance with this section.

(3) The term ''source'' means any building, structure, facility, or installation from which there is or may be the discharge of pollutants.

(4) The term ''owner or operator'' means any person who owns, leases, operates, controls, or supervises a source.

(5) The term ''construction'' means any placement, assembly, or installation of facilities or equipment (including contractual obligations to purchase such facilities or equipment) at the premises where such equipment will be used, including preparation work at such premises.

### (b) Categories of sources; Federal standards of performance for new sources

(1)(A) The Administrator shall, within ninety days after October 18, 1972, publish (and from time to time thereafter shall revise) a list of categories of sources, which shall, at the minimum, include:

pulp and paper mills;
paperboard, builders paper and board mills;
meat product and rendering processing;
dairy product processing;
grain mills;
canned and preserved fruits and vegetables processing;
canned and preserved seafood processing;
sugar processing;
textile mills;
cement manufacturing;
feedlots;
electroplating;
organic chemicals manufacturing;
inorganic chemicals manufacturing;
plastic and synthetic materials manufacturing;
soap and detergent manufacturing;
fertilizer manufacturing;
petroleum refining;
iron and steel manufacturing;
nonferrous metals manufacturing;
phosphate manufacturing;
steam electric powerplants;
ferroalloy manufacturing;
leather tanning and finishing;
glass and asbestos manufacturing;
rubber processing; and
timber products processing.

(B) As soon as practicable, but in no case more than one year, after a category of sources is included in a list under subparagraph (A) of this paragraph, the Administrator shall propose and publish regulations establishing Federal standards of performance for new sources within such category. The Administrator shall afford interested persons an opportunity for written comment on such proposed regulations. After considering such comments, he shall promulgate, within one hundred and twenty days after publication of such proposed regulations, such standards with such adjustments as he deems appropriate. The Administrator shall, from time to time, as technology and alternatives change, revise such standards following the procedure required by this subsection for promulgation of



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such standards. Standards of performance, or revisions thereof, shall become effective upon promulgation. In establishing or revising Federal standards of performance for new sources under this section, the Administrator shall take into consideration the cost of achieving such effluent reduction, and any non-water quality, environmental impact and energy requirements.

(2) The Administrator may distinguish among classes, types, and sizes within categories of new sources for the purpose of establishing such standards and shall consider the type of process employed (including whether batch or continuous).

(3) The provisions of this section shall apply to any new source owned or operated by the United States.

**(c) State enforcement of standards of performance**

Each State may develop and submit to the Administrator a procedure under State law for applying and enforcing standards of performance for new sources located in such State. If the Administrator finds that the procedure and the law of any State require the application and enforcement of standards of performance to at least the same extent as required by this section, such State is authorized to apply and enforce such standards of performance (except with respect to new sources owned or operated by the United States).

**(d) Protection from more stringent standards**

Notwithstanding any other provision of this chapter, any point source the construction of which is commenced after October 18, 1972, and which is so constructed as to meet all applicable standards of performance shall not be subject to any more stringent standard of performance during a ten-year period beginning on the date of completion of such construction or during the period of depreciation or amortization of such facility for the purposes of section 167 or 169 (or both) of title 26 whichever period ends first.

**(e) Illegality of operation of new sources in violation of applicable standards of performance**

After the effective date of standards of performance promulgated under this section, it shall be unlawful for any owner or operator of any new source to operate such source in violation of any standard of performance applicable to such source.

(June 30, 1948, ch. 758, title III, §306, as added Pub. L. 92–500, §2, Oct. 18, 1972, 86 Stat. 854.)

**Statutory Notes and Related Subsidiaries**

DISCHARGES FROM POINT SOURCES IN UNITED STATES VIRGIN ISLANDS ATTRIBUTABLE TO MANUFACTURE OF RUM; EXEMPTION; CONDITIONS

Discharges from point sources in the United States Virgin Islands in existence on Aug. 5, 1983, attributable to the manufacture of rum not to be subject to the requirements of this section under certain conditions, see section 214(g) of Pub. L. 98–67, set out as a note under section 1311 of this title.

**§ 1317. Toxic and pretreatment effluent standards**

**(a) Toxic pollutant list; revision; hearing; promulgation of standards; effective date; consultation**

(1) On and after December 27, 1977, the list of toxic pollutants or combination of pollutants subject to this chapter shall consist of those toxic pollutants listed in table 1 of Committee Print Numbered 95–30 of the Committee on Public Works and Transportation of the House of Representatives, and the Administrator shall publish, not later than the thirtieth day after December 27, 1977, that list. From time to time thereafter, the Administrator may revise such list and the Administrator is authorized to add to or remove from such list any pollutant. The Administrator in publishing any revised list, including the addition or removal of any pollutant from such list, shall take into account toxicity of the pollutant, its persistence, degradability, the usual or potential presence of the affected organisms in any waters, the importance of the affected organisms, and the nature and extent of the effect of the toxic pollutant on such organisms. A determination of the Administrator under this paragraph shall be final except that if, on judicial review, such determination was based on arbitrary and capricious action of the Administrator, the Administrator shall make a redetermination.

(2) Each toxic pollutant listed in accordance with paragraph (1) of this subsection shall be subject to effluent limitations resulting from the application of the best available technology economically achievable for the applicable category or class of point sources established in accordance with sections 1311(b)(2)(A) and 1314(b)(2) of this title. The Administrator, in his discretion, may publish in the Federal Register a proposed effluent standard (which may include a prohibition) establishing requirements for a toxic pollutant which, if an effluent limitation is applicable to a class or category of point sources, shall be applicable to such category or class only if such standard imposes more stringent requirements. Such published effluent standard (or prohibition) shall take into account the toxicity of the pollutant, its persistence, degradability, the usual or potential presence of the affected organisms in any waters, the importance of the affected organisms and the nature and extent of the effect of the toxic pollutant on such organisms, and the extent to which effective control is being or may be achieved under other regulatory authority. The Administrator shall allow a period of not less than sixty days following publication of any such proposed effluent standard (or prohibition) for written comment by interested persons on such proposed standard. In addition, if within thirty days of publication of any such proposed effluent standard (or prohibition) any interested person so requests, the Administrator shall hold a public hearing in connection therewith. Such a public hearing shall provide an opportunity for oral and written presentations, such cross-examination as the Administrator determines is appropriate on disputed issues of material fact, and the transcription of a verbatim record which



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shall be available to the public. After consideration of such comments and any information and material presented at any public hearing held on such proposed standard or prohibition, the Administrator shall promulgate such standard (or prohibition) with such modification as the Administrator finds are justified. Such promulgation by the Administrator shall be made within two hundred and seventy days after publication of proposed standard (or prohibition). Such standard (or prohibition) shall be final except that if, on judicial review, such standard was not based on substantial evidence, the Administrator shall promulgate a revised standard. Effluent limitations shall be established in accordance with sections 1311(b)(2)(A) and 1314(b)(2) of this title for every toxic pollutant referred to in table 1 of Committee Print Numbered 95–30 of the Committee on Public Works and Transportation of the House of Representatives as soon as practicable after December 27, 1977, but no later than July 1, 1980. Such effluent limitations or effluent standards (or prohibitions) shall be established for every other toxic pollutant listed under paragraph (1) of this subsection as soon as practicable after it is so listed.

(3) Each such effluent standard (or prohibition) shall be reviewed and, if appropriate, revised at least every three years.

(4) Any effluent standard promulgated under this section shall be at that level which the Administrator determines provides an ample margin of safety.

(5) When proposing or promulgating any effluent standard (or prohibition) under this section, the Administrator shall designate the category or categories of sources to which the effluent standard (or prohibition) shall apply. Any disposal of dredged material may be included in such a category of sources after consultation with the Secretary of the Army.

(6) Any effluent standard (or prohibition) established pursuant to this section shall take effect on such date or dates as specified in the order promulgating such standard, but in no case, more than one year from the date of such promulgation. If the Administrator determines that compliance within one year from the date of promulgation is technologically infeasible for a category of sources, the Administrator may establish the effective date of the effluent standard (or prohibition) for such category at the earliest date upon which compliance can be feasibly attained by sources within such category, but in no event more than three years after the date of such promulgation.

(7) Prior to publishing any regulations pursuant to this section the Administrator shall, to the maximum extent practicable within the time provided, consult with appropriate advisory committees, States, independent experts, and Federal departments and agencies.

**(b) Pretreatment standards; hearing; promulgation; compliance period; revision; application to State and local laws**

(1) The Administrator shall, within one hundred and eighty days after October 18, 1972, and from time to time thereafter, publish proposed regulations establishing pretreatment standards for introduction of pollutants into treatment works (as defined in section 1292 of this title) which are publicly owned for those pollutants which are determined not to be susceptible to treatment by such treatment works or which would interfere with the operation of such treatment works. Not later than ninety days after such publication, and after opportunity for public hearing, the Administrator shall promulgate such pretreatment standards. Pretreatment standards under this subsection shall specify a time for compliance not to exceed three years from the date of promulgation and shall be established to prevent the discharge of any pollutant through treatment works (as defined in section 1292 of this title) which are publicly owned, which pollutant interferes with, passes through, or otherwise is incompatible with such works. If, in the case of any toxic pollutant under subsection (a) of this section introduced by a source into a publicly owned treatment works, the treatment by such works removes all or any part of such toxic pollutant and the discharge from such works does not violate that effluent limitation or standard which would be applicable to such toxic pollutant if it were discharged by such source other than through a publicly owned treatment works, and does not prevent sludge use or disposal by such works in accordance with section 1345 of this title, then the pretreatment requirements for the sources actually discharging such toxic pollutant into such publicly owned treatment works may be revised by the owner or operator of such works to reflect the removal of such toxic pollutant by such works.

(2) The Administrator shall, from time to time, as control technology, processes, operating methods, or other alternatives change, revise such standards following the procedure established by this subsection for promulgation of such standards.

(3) When proposing or promulgating any pretreatment standard under this section, the Administrator shall designate the category or categories of sources to which such standard shall apply.

(4) Nothing in this subsection shall affect any pretreatment requirement established by any State or local law not in conflict with any pretreatment standard established under this subsection.

**(c) New sources of pollutants into publicly owned treatment works**

In order to insure that any source introducing pollutants into a publicly owned treatment works, which source would be a new source subject to section 1316 of this title if it were to discharge pollutants, will not cause a violation of the effluent limitations established for any such treatment works, the Administrator shall promulgate pretreatment standards for the category of such sources simultaneously with the promulgation of standards of performance under section 1316 of this title for the equivalent category of new sources. Such pretreatment standards shall prevent the discharge of any pollutant into such treatment works, which pollutant may interfere with, pass through, or otherwise be incompatible with such works.



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ceived from the certifying State, agency, or Administrator, as the case may be, that there is reasonable assurance that such facility or activity will not violate the applicable provisions of section 1311, 1312, 1313, 1316, or 1317 of this title.

(5) Any Federal license or permit with respect to which a certification has been obtained under paragraph (1) of this subsection may be suspended or revoked by the Federal agency issuing such license or permit upon the entering of a judgment under this chapter that such facility or activity has been operated in violation of the applicable provisions of section 1311, 1312, 1313, 1316, or 1317 of this title.

(6) Except with respect to a permit issued under section 1342 of this title, in any case where actual construction of a facility has been lawfully commenced prior to April 3, 1970, no certification shall be required under this subsection for a license or permit issued after April 3, 1970, to operate such facility, except that any such license or permit issued without certification shall terminate April 3, 1973, unless prior to such termination date the person having such license or permit submits to the Federal agency which issued such license or permit a certification and otherwise meets the requirements of this section.

**(b) Compliance with other provisions of law setting applicable water quality requirements**

Nothing in this section shall be construed to limit the authority of any department or agency pursuant to any other provision of law to require compliance with any applicable water quality requirements. The Administrator shall, upon the request of any Federal department or agency, or State or interstate agency, or applicant, provide, for the purpose of this section, any relevant information on applicable effluent limitations, or other limitations, standards, regulations, or requirements, or water quality criteria, and shall, when requested by any such department or agency or State or interstate agency, or applicant, comment on any methods to comply with such limitations, standards, regulations, requirements, or criteria.

**(c) Authority of Secretary of the Army to permit use of spoil disposal areas by Federal licensees or permittees**

In order to implement the provisions of this section, the Secretary of the Army, acting through the Chief of Engineers, is authorized, if he deems it to be in the public interest, to permit the use of spoil disposal areas under his jurisdiction by Federal licensees or permittees, and to make an appropriate charge for such use. Moneys received from such licensees or permittees shall be deposited in the Treasury as miscellaneous receipts.

**(d) Limitations and monitoring requirements of certification**

Any certification provided under this section shall set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant for a Federal license or permit will comply with any applicable effluent limitations and other limitations, under section 1311 or 1312 of this title, standard of performance under section 1316 of this title, or prohibition, effluent standard, or pretreatment standard under section 1317 of this title, and with any other appropriate requirement of State law set forth in such certification, and shall become a condition on any Federal license or permit subject to the provisions of this section.

(June 30, 1948, ch. 758, title IV, § 401, as added Pub. L. 92–500, § 2, Oct. 18, 1972, 86 Stat. 877; amended Pub. L. 95–217, §§ 61(b), 64, Dec. 27, 1977, 91 Stat. 1598, 1599.)

**Editorial Notes**

AMENDMENTS

1977—Subsec. (a). Pub. L. 95–217 inserted reference to section 1313 of this title in pars. (1), (3), (4), and (5), struck out par. (6) which provided that no Federal agency be deemed an applicant for purposes of this subsection, and redesignated par. (7) as (6).

## § 1342. National pollutant discharge elimination system

**(a) Permits for discharge of pollutants**

(1) Except as provided in sections 1328 and 1344 of this title, the Administrator may, after opportunity for public hearing issue a permit for the discharge of any pollutant, or combination of pollutants, notwithstanding section 1311(a) of this title, upon condition that such discharge will meet either (A) all applicable requirements under sections 1311, 1312, 1316, 1317, 1318, and 1343 of this title, or (B) prior to the taking of necessary implementing actions relating to all such requirements, such conditions as the Administrator determines are necessary to carry out the provisions of this chapter.

(2) The Administrator shall prescribe conditions for such permits to assure compliance with the requirements of paragraph (1) of this subsection, including conditions on data and information collection, reporting, and such other requirements as he deems appropriate.

(3) The permit program of the Administrator under paragraph (1) of this subsection, and permits issued thereunder, shall be subject to the same terms, conditions, and requirements as apply to a State permit program and permits issued thereunder under subsection (b) of this section.

(4) All permits for discharges into the navigable waters issued pursuant to section 407 of this title shall be deemed to be permits issued under this subchapter, and permits issued under this subchapter shall be deemed to be permits issued under section 407 of this title, and shall continue in force and effect for their term unless revoked, modified, or suspended in accordance with the provisions of this chapter.

(5) No permit for a discharge into the navigable waters shall be issued under section 407 of this title after October 18, 1972. Each application for a permit under section 407 of this title, pending on October 18, 1972, shall be deemed to be an application for a permit under this section. The Administrator shall authorize a State, which he determines has the capability of administering a permit program which will carry out the objectives of this chapter to issue permits for discharges into the navigable waters within the ju-



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risdiction of such State. The Administrator may exercise the authority granted him by the preceding sentence only during the period which begins on October 18, 1972, and ends either on the ninetieth day after the date of the first promulgation of guidelines required by section 1314(i)(2) of this title, or the date of approval by the Administrator of a permit program for such State under subsection (b) of this section, whichever date first occurs, and no such authorization to a State shall extend beyond the last day of such period. Each such permit shall be subject to such conditions as the Administrator determines are necessary to carry out the provisions of this chapter. No such permit shall issue if the Administrator objects to such issuance.

**(b) State permit programs**

At any time after the promulgation of the guidelines required by subsection (i)(2) of section 1314 of this title, the Governor of each State desiring to administer its own permit program for discharges into navigable waters within its jurisdiction may submit to the Administrator a full and complete description of the program it proposes to establish and administer under State law or under an interstate compact. In addition, such State shall submit a statement from the attorney general (or the attorney for those State water pollution control agencies which have independent legal counsel), or from the chief legal officer in the case of an interstate agency, that the laws of such State, or the interstate compact, as the case may be, provide adequate authority to carry out the described program. The Administrator shall approve each submitted program unless he determines that adequate authority does not exist:

(1) To issue permits which—

(A) apply, and insure compliance with, any applicable requirements of sections 1311, 1312, 1316, 1317, and 1343 of this title;

(B) are for fixed terms not exceeding five years; and

(C) can be terminated or modified for cause including, but not limited to, the following:

(i) violation of any condition of the permit;

(ii) obtaining a permit by misrepresentation, or failure to disclose fully all relevant facts;

(iii) change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge;

(D) control the disposal of pollutants into wells;

(2)(A) To issue permits which apply, and insure compliance with, all applicable requirements of section 1318 of this title; or

(B) To inspect, monitor, enter, and require reports to at least the same extent as required in section 1318 of this title;

(3) To insure that the public, and any other State the waters of which may be affected, receive notice of each application for a permit and to provide an opportunity for public hearing before a ruling on each such application;

(4) To insure that the Administrator receives notice of each application (including a copy thereof) for a permit;

(5) To insure that any State (other than the permitting State), whose waters may be affected by the issuance of a permit may submit written recommendations to the permitting State (and the Administrator) with respect to any permit application and, if any part of such written recommendations are not accepted by the permitting State, that the permitting State will notify such affected State (and the Administrator) in writing of its failure to so accept such recommendations together with its reasons for so doing;

(6) To insure that no permit will be issued if, in the judgment of the Secretary of the Army acting through the Chief of Engineers, after consultation with the Secretary of the department in which the Coast Guard is operating, anchorage and navigation of any of the navigable waters would be substantially impaired thereby;

(7) To abate violations of the permit or the permit program, including civil and criminal penalties and other ways and means of enforcement;

(8) To insure that any permit for a discharge from a publicly owned treatment works includes conditions to require the identification in terms of character and volume of pollutants of any significant source introducing pollutants subject to pretreatment standards under section 1317(b) of this title into such works and a program to assure compliance with such pretreatment standards by each such source, in addition to adequate notice to the permitting agency of (A) new introductions into such works of pollutants from any source which would be a new source as defined in section 1316 of this title if such source were discharging pollutants, (B) new introductions of pollutants into such works from a source which would be subject to section 1311 of this title if it were discharging such pollutants, or (C) a substantial change in volume or character of pollutants being introduced into such works by a source introducing pollutants into such works at the time of issuance of the permit. Such notice shall include information on the quality and quantity of effluent to be introduced into such treatment works and any anticipated impact of such change in the quantity or quality of effluent to be discharged from such publicly owned treatment works; and

(9) To insure that any industrial user of any publicly owned treatment works will comply with sections 1284(b), 1317, and 1318 of this title.

**(c) Suspension of Federal program upon submission of State program; withdrawal of approval of State program; return of State program to Administrator**

(1) Not later than ninety days after the date on which a State has submitted a program (or revision thereof) pursuant to subsection (b) of this section, the Administrator shall suspend the issuance of permits under subsection (a) of this section as to those discharges subject to such program unless he determines that the State permit program does not meet the requirements of subsection (b) of this section or does not conform to the guidelines issued under section 1314(i)(2) of this title. If the Administrator so determines, he shall notify the State of any revisions or modifications necessary to conform to such requirements or guidelines.



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(2) Any State permit program under this section shall at all times be in accordance with this section and guidelines promulgated pursuant to section 1314(i)(2) of this title.

(3) Whenever the Administrator determines after public hearing that a State is not administering a program approved under this section in accordance with requirements of this section, he shall so notify the State and, if appropriate corrective action is not taken within a reasonable time, not to exceed ninety days, the Administrator shall withdraw approval of such program. The Administrator shall not withdraw approval of any such program unless he shall first have notified the State, and made public, in writing, the reasons for such withdrawal.

(4) LIMITATIONS ON PARTIAL PERMIT PROGRAM RETURNS AND WITHDRAWALS.—A State may return to the Administrator administration, and the Administrator may withdraw under paragraph (3) of this subsection approval, of—

(A) a State partial permit program approved under subsection (n)(3) only if the entire permit program being administered by the State department or agency at the time is returned or withdrawn; and

(B) a State partial permit program approved under subsection (n)(4) only if an entire phased component of the permit program being administered by the State at the time is returned or withdrawn.

**(d) Notification of Administrator**

(1) Each State shall transmit to the Administrator a copy of each permit application received by such State and provide notice to the Administrator of every action related to the consideration of such permit application, including each permit proposed to be issued by such State.

(2) No permit shall issue (A) if the Administrator within ninety days of the date of his notification under subsection (b)(5) of this section objects in writing to the issuance of such permit, or (B) if the Administrator within ninety days of the date of transmittal of the proposed permit by the State objects in writing to the issuance of such permit as being outside the guidelines and requirements of this chapter. Whenever the Administrator objects to the issuance of a permit under this paragraph such written objection shall contain a statement of the reasons for such objection and the effluent limitations and conditions which such permit would include if it were issued by the Administrator.

(3) The Administrator may, as to any permit application, waive paragraph (2) of this subsection.

(4) In any case where, after December 27, 1977, the Administrator, pursuant to paragraph (2) of this subsection, objects to the issuance of a permit, on request of the State, a public hearing shall be held by the Administrator on such objection. If the State does not resubmit such permit revised to meet such objection within 30 days after completion of the hearing, or, if no hearing is requested within 90 days after the date of such objection, the Administrator may issue the permit pursuant to subsection (a) of this section for such source in accordance with the guidelines and requirements of this chapter.

**(e) Waiver of notification requirement**

In accordance with guidelines promulgated pursuant to subsection (i)(2) of section 1314 of this title, the Administrator is authorized to waive the requirements of subsection (d) of this section at the time he approves a program pursuant to subsection (b) of this section for any category (including any class, type, or size within such category) of point sources within the State submitting such program.

**(f) Point source categories**

The Administrator shall promulgate regulations establishing categories of point sources which he determines shall not be subject to the requirements of subsection (d) of this section in any State with a program approved pursuant to subsection (b) of this section. The Administrator may distinguish among classes, types, and sizes within any category of point sources.

**(g) Other regulations for safe transportation, handling, carriage, storage, and stowage of pollutants**

Any permit issued under this section for the discharge of pollutants into the navigable waters from a vessel or other floating craft shall be subject to any applicable regulations promulgated by the Secretary of the department in which the Coast Guard is operating, establishing specifications for safe transportation, handling, carriage, storage, and stowage of pollutants.

**(h) Violation of permit conditions; restriction or prohibition upon introduction of pollutant by source not previously utilizing treatment works**

In the event any condition of a permit for discharges from a treatment works (as defined in section 1292 of this title) which is publicly owned is violated, a State with a program approved under subsection (b) of this section or the Administrator, where no State program is approved or where the Administrator determines pursuant to section 1319(a) of this title that a State with an approved program has not commenced appropriate enforcement action with respect to such permit, may proceed in a court of competent jurisdiction to restrict or prohibit the introduction of any pollutant into such treatment works by a source not utilizing such treatment works prior to the finding that such condition was violated.

**(i) Federal enforcement not limited**

Nothing in this section shall be construed to limit the authority of the Administrator to take action pursuant to section 1319 of this title.

**(j) Public information**

A copy of each permit application and each permit issued under this section shall be available to the public. Such permit application or permit, or portion thereof, shall further be available on request for the purpose of reproduction.

**(k) Compliance with permits**

Compliance with a permit issued pursuant to this section shall be deemed compliance, for purposes of sections 1319 and 1365 of this title, with sections 1311, 1312, 1316, 1317, and 1343 of this title, except any standard imposed under section



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1317 of this title for a toxic pollutant injurious to human health. Until December 31, 1974, in any case where a permit for discharge has been applied for pursuant to this section, but final administrative disposition of such application has not been made, such discharge shall not be a violation of (1) section 1311, 1316, or 1342 of this title, or (2) section 407 of this title, unless the Administrator or other plaintiff proves that final administrative disposition of such application has not been made because of the failure of the applicant to furnish information reasonably required or requested in order to process the application. For the 180-day period beginning on October 18, 1972, in the case of any point source discharging any pollutant or combination of pollutants immediately prior to such date which source is not subject to section 407 of this title, the discharge by such source shall not be a violation of this chapter if such a source applies for a permit for discharge pursuant to this section within such 180-day period.

**(*l*) Limitation on permit requirement**

**(1) Agricultural return flows**

The Administrator shall not require a permit under this section for discharges composed entirely of return flows from irrigated agriculture, nor shall the Administrator directly or indirectly, require any State to require such a permit.

**(2) Stormwater runoff from oil, gas, and mining operations**

The Administrator shall not require a permit under this section, nor shall the Administrator directly or indirectly require any State to require a permit, for discharges of stormwater runoff from mining operations or oil and gas exploration, production, processing, or treatment operations or transmission facilities, composed entirely of flows which are from conveyances or systems of conveyances (including but not limited to pipes, conduits, ditches, and channels) used for collecting and conveying precipitation runoff and which are not contaminated by contact with, or do not come into contact with, any overburden, raw material, intermediate products, finished product, byproduct, or waste products located on the site of such operations.

**(3) Silvicultural activities**

(A) NPDES PERMIT REQUIREMENTS FOR SILVICULTURAL ACTIVITIES.—The Administrator shall not require a permit under this section nor directly or indirectly require any State to require a permit under this section for a discharge from runoff resulting from the conduct of the following silviculture activities conducted in accordance with standard industry practice: nursery operations, site preparation, reforestation and subsequent cultural treatment, thinning, prescribed burning, pest and fire control, harvesting operations, surface drainage, or road construction and maintenance.

(B) OTHER REQUIREMENTS.—Nothing in this paragraph exempts a discharge from silvicultural activity from any permitting requirement under section 1344 of this title, existing permitting requirements under section 1342 of this title, or from any other federal law.

(C) The authorization provided in Section[1] 1365(a) of this title does not apply to any nonpermitting program established under 1342(p)(6)[2] of this title for the silviculture activities listed in 1342(*l*)(3)(A)[2] of this title, or to any other limitations that might be deemed to apply to the silviculture activities listed in 1342(*l*)(3)(A)[2] of this title.

**(m) Additional pretreatment of conventional pollutants not required**

To the extent a treatment works (as defined in section 1292 of this title) which is publicly owned is not meeting the requirements of a permit issued under this section for such treatment works as a result of inadequate design or operation of such treatment works, the Administrator, in issuing a permit under this section, shall not require pretreatment by a person introducing conventional pollutants identified pursuant to section 1314(a)(4) of this title into such treatment works other than pretreatment required to assure compliance with pretreatment standards under subsection (b)(8) of this section and section 1317(b)(1) of this title. Nothing in this subsection shall affect the Administrator's authority under sections 1317 and 1319 of this title, affect State and local authority under sections 1317(b)(4) and 1370 of this title, relieve such treatment works of its obligations to meet requirements established under this chapter, or otherwise preclude such works from pursuing whatever feasible options are available to meet its responsibility to comply with its permit under this section.

**(n) Partial permit program**

**(1) State submission**

The Governor of a State may submit under subsection (b) of this section a permit program for a portion of the discharges into the navigable waters in such State.

**(2) Minimum coverage**

A partial permit program under this subsection shall cover, at a minimum, administration of a major category of the discharges into the navigable waters of the State or a major component of the permit program required by subsection (b).

**(3) Approval of major category partial permit programs**

The Administrator may approve a partial permit program covering administration of a major category of discharges under this subsection if—

(A) such program represents a complete permit program and covers all of the discharges under the jurisdiction of a department or agency of the State; and

(B) the Administrator determines that the partial program represents a significant and identifiable part of the State program required by subsection (b).

**(4) Approval of major component partial permit programs**

The Administrator may approve under this subsection a partial and phased permit pro-

[1] So in original. Probably should not be capitalized.

[2] So in original. Probably should be preceded by ''section''.



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gram covering administration of a major component (including discharge categories) of a State permit program required by subsection (b) if—

(A) the Administrator determines that the partial program represents a significant and identifiable part of the State program required by subsection (b); and

(B) the State submits, and the Administrator approves, a plan for the State to assume administration by phases of the remainder of the State program required by subsection (b) by a specified date not more than 5 years after submission of the partial program under this subsection and agrees to make all reasonable efforts to assume such administration by such date.

**(*o*) Anti-backsliding**

**(1) General prohibition**

In the case of effluent limitations established on the basis of subsection (a)(1)(B) of this section, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 1314(b) of this title subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit. In the case of effluent limitations established on the basis of section 1311(b)(1)(C) or section 1313(d) or (e) of this title, a permit may not be renewed, reissued, or modified to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit except in compliance with section 1313(d)(4) of this title.

**(2) Exceptions**

A permit with respect to which paragraph (1) applies may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant if—

(A) material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation;

(B)(i) information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance; or

(ii) the Administrator determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under subsection (a)(1)(B);

(C) a less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy;

(D) the permittee has received a permit modification under section 1311(c), 1311(g), 1311(h), 1311(i), 1311(k), 1311(n), or 1326(a) of this title; or

(E) the permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

Subparagraph (B) shall not apply to any revised waste load allocations or any alternative grounds for translating water quality standards into effluent limitations, except where the cumulative effect of such revised allocations results in a decrease in the amount of pollutants discharged into the concerned waters, and such revised allocations are not the result of a discharger eliminating or substantially reducing its discharge of pollutants due to complying with the requirements of this chapter or for reasons otherwise unrelated to water quality.

**(3) Limitations**

In no event may a permit with respect to which paragraph (1) applies be renewed, reissued, or modified to contain an effluent limitation which is less stringent than required by effluent guidelines in effect at the time the permit is renewed, reissued, or modified. In no event may such a permit to discharge into waters be renewed, reissued, or modified to contain a less stringent effluent limitation if the implementation of such limitation would result in a violation of a water quality standard under section 1313 of this title applicable to such waters.

**(p) Municipal and industrial stormwater discharges**

**(1) General rule**

Prior to October 1, 1994, the Administrator or the State (in the case of a permit program approved under this section) shall not require a permit under this section for discharges composed entirely of stormwater.

**(2) Exceptions**

Paragraph (1) shall not apply with respect to the following stormwater discharges:

(A) A discharge with respect to which a permit has been issued under this section before February 4, 1987.

(B) A discharge associated with industrial activity.

(C) A discharge from a municipal separate storm sewer system serving a population of 250,000 or more.

(D) A discharge from a municipal separate storm sewer system serving a population of 100,000 or more but less than 250,000.

(E) A discharge for which the Administrator or the State, as the case may be, determines that the stormwater discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

**(3) Permit requirements**

**(A) Industrial discharges**

Permits for discharges associated with industrial activity shall meet all applicable



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provisions of this section and section 1311 of this title.

**(B) Municipal discharge**

Permits for discharges from municipal storm sewers—

(i) may be issued on a system- or jurisdiction-wide basis;

(ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers; and

(iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.

**(4) Permit application requirements**

**(A) Industrial and large municipal discharges**

Not later than 2 years after February 4, 1987, the Administrator shall establish regulations setting forth the permit application requirements for stormwater discharges described in paragraphs (2)(B) and (2)(C). Applications for permits for such discharges shall be filed no later than 3 years after February 4, 1987. Not later than 4 years after February 4, 1987, the Administrator or the State, as the case may be, shall issue or deny each such permit. Any such permit shall provide for compliance as expeditiously as practicable, but in no event later than 3 years after the date of issuance of such permit.

**(B) Other municipal discharges**

Not later than 4 years after February 4, 1987, the Administrator shall establish regulations setting forth the permit application requirements for stormwater discharges described in paragraph (2)(D). Applications for permits for such discharges shall be filed no later than 5 years after February 4, 1987. Not later than 6 years after February 4, 1987, the Administrator or the State, as the case may be, shall issue or deny each such permit. Any such permit shall provide for compliance as expeditiously as practicable, but in no event later than 3 years after the date of issuance of such permit.

**(5) Studies**

The Administrator, in consultation with the States, shall conduct a study for the purposes of—

(A) identifying those stormwater discharges or classes of stormwater discharges for which permits are not required pursuant to paragraphs (1) and (2) of this subsection;

(B) determining, to the maximum extent practicable, the nature and extent of pollutants in such discharges; and

(C) establishing procedures and methods to control stormwater discharges to the extent necessary to mitigate impacts on water quality.

Not later than October 1, 1988, the Administrator shall submit to Congress a report on the results of the study described in subparagraphs (A) and (B). Not later than October 1, 1989, the Administrator shall submit to Congress a report on the results of the study described in subparagraph (C).

**(6) Regulations**

Not later than October 1, 1993, the Administrator, in consultation with State and local officials, shall issue regulations (based on the results of the studies conducted under paragraph (5)) which designate stormwater discharges, other than those discharges described in paragraph (2), to be regulated to protect water quality and shall establish a comprehensive program to regulate such designated sources. The program shall, at a minimum, (A) establish priorities, (B) establish requirements for State stormwater management programs, and (C) establish expeditious deadlines. The program may include performance standards, guidelines, guidance, and management practices and treatment requirements, as appropriate.

**(q) Combined sewer overflows**

**(1) Requirement for permits, orders, and decrees**

Each permit, order, or decree issued pursuant to this chapter after December 21, 2000, for a discharge from a municipal combined storm and sanitary sewer shall conform to the Combined Sewer Overflow Control Policy signed by the Administrator on April 11, 1994 (in this subsection referred to as the ''CSO control policy'').

**(2) Water quality and designated use review guidance**

Not later than July 31, 2001, and after providing notice and opportunity for public comment, the Administrator shall issue guidance to facilitate the conduct of water quality and designated use reviews for municipal combined sewer overflow receiving waters.

**(3) Report**

Not later than September 1, 2001, the Administrator shall transmit to Congress a report on the progress made by the Environmental Protection Agency, States, and municipalities in implementing and enforcing the CSO control policy.

**(r) Discharges incidental to the normal operation of recreational vessels**

No permit shall be required under this chapter by the Administrator (or a State, in the case of a permit program approved under subsection (b)) for the discharge of any graywater, bilge water, cooling water, weather deck runoff, oil water separator effluent, or effluent from properly functioning marine engines, or any other discharge that is incidental to the normal operation of a vessel, if the discharge is from a recreational vessel.

**(s) Integrated plans**

**(1) Definition of integrated plan**

In this subsection, the term ''integrated plan'' means a plan developed in accordance with the Integrated Municipal Stormwater and Wastewater Planning Approach Frame-



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work, issued by the Environmental Protection Agency and dated June 5, 2012.

**(2) In general**

The Administrator (or a State, in the case of a permit program approved by the Administrator) shall inform municipalities of the opportunity to develop an integrated plan that may be incorporated into a permit under this section.

**(3) Scope**

**(A) Scope of permit incorporating integrated plan**

A permit issued under this section that incorporates an integrated plan may integrate all requirements under this chapter addressed in the integrated plan, including requirements relating to—

(i) a combined sewer overflow;

(ii) a capacity, management, operation, and maintenance program for sanitary sewer collection systems;

(iii) a municipal stormwater discharge;

(iv) a municipal wastewater discharge; and

(v) a water quality-based effluent limitation to implement an applicable wasteload allocation in a total maximum daily load.

**(B) Inclusions in integrated plan**

An integrated plan incorporated into a permit issued under this section may include the implementation of—

(i) projects, including innovative projects, to reclaim, recycle, or reuse water; and

(ii) green infrastructure.

**(4) Compliance schedules**

**(A) In general**

A permit issued under this section that incorporates an integrated plan may include a schedule of compliance, under which actions taken to meet any applicable water quality-based effluent limitation may be implemented over more than 1 permit term if the schedule of compliance—

(i) is authorized by State water quality standards; and

(ii) meets the requirements of section 122.47 of title 40, Code of Federal Regulations (as in effect on January 14, 2019).

**(B) Time for compliance**

For purposes of subparagraph (A)(ii), the requirement of section 122.47 of title 40, Code of Federal Regulations, for compliance by an applicable statutory deadline under this chapter does not prohibit implementation of an applicable water quality-based effluent limitation over more than 1 permit term.

**(C) Review**

A schedule of compliance incorporated into a permit issued under this section may be reviewed at the time the permit is renewed to determine whether the schedule should be modified.

**(5) Existing authorities retained**

**(A) Applicable standards**

Nothing in this subsection modifies any obligation to comply with applicable technology and water quality-based effluent limitations under this chapter.

**(B) Flexibility**

Nothing in this subsection reduces or eliminates any flexibility available under this chapter, including the authority of a State to revise a water quality standard after a use attainability analysis under section 131.10(g) of title 40, Code of Federal Regulations (or a successor regulation), subject to the approval of the Administrator under section 1313(c) of this title.

**(6) Clarification of State authority**

**(A) In general**

Nothing in section 1311(b)(1)(C) of this title precludes a State from authorizing in the water quality standards of the State the issuance of a schedule of compliance to meet water quality-based effluent limitations in permits that incorporate provisions of an integrated plan.

**(B) Transition rule**

In any case in which a discharge is subject to a judicial order or consent decree, as of January 14, 2019, resolving an enforcement action under this chapter, any schedule of compliance issued pursuant to an authorization in a State water quality standard may not revise a schedule of compliance in that order or decree to be less stringent, unless the order or decree is modified by agreement of the parties and the court.

(June 30, 1948, ch. 758, title IV, §402, as added Pub. L. 92–500, §2, Oct. 18, 1972, 86 Stat. 880; amended Pub. L. 95–217, §§33(c), 50, 54(c)(1), 65, 66, Dec. 27, 1977, 91 Stat. 1577, 1588, 1591, 1599, 1600; Pub. L. 100–4, title IV, §§401–404(a), 404(c), formerly 404(d), 405, Feb. 4, 1987, 101 Stat. 65–67, 69, renumbered §404(c), Pub. L. 104–66, title II, §2021(e)(2), Dec. 21, 1995, 109 Stat. 727; Pub. L. 102–580, title III, §364, Oct. 31, 1992, 106 Stat. 4862; Pub. L. 106–554, §1(a)(4) [div. B, title I, §112(a)], Dec. 21, 2000, 114 Stat. 2763, 2763A–224; Pub. L. 110–288, §2, July 29, 2008, 122 Stat. 2650; Pub. L. 113–79, title XII, §12313, Feb. 7, 2014, 128 Stat. 992; Pub. L. 115–436, §3(a), Jan. 14, 2019, 132 Stat. 5558.)

**Editorial Notes**

AMENDMENTS

2019—Subsec. (s). Pub. L. 115–436 added subsec. (s).

2014—Subsec. (*l*)(3). Pub. L. 113–79 added par. (3).

2008—Subsec. (r). Pub. L. 110–288 added subsec. (r).

2000—Subsec. (q). Pub. L. 106–554 added subsec. (q).

1992—Subsec. (p)(1), (6). Pub. L. 102–580 substituted ''October 1, 1994'' for ''October 1, 1992'' in par. (1) and ''October 1, 1993'' for ''October 1, 1992'' in par. (6).

1987—Subsec. (a)(1). Pub. L. 100–4, §404(c), inserted cl. (A) and (B) designations.

Subsec. (c)(1). Pub. L. 100–4, §403(b)(2), substituted ''as to those discharges'' for ''as to those navigable waters''.

Subsec. (c)(4). Pub. L. 100–4, §403(b)(1), added par. (4).

Subsec. (*l*). Pub. L. 100–4, §401, inserted ''Limitation on permit requirement'' as subsec. heading designated existing provisions as par. (1) and inserted par. heading, added par. (2), and aligned pars. (1) and (2).

Subsecs. (m) to (p). Pub. L. 100–4, §§402, 403(a), 404(a), 405, added subsecs. (m) to (p).



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**Statutory Notes and Related Subsidiaries**

APPLICABILITY OF SPILL PREVENTION, CONTROL, AND COUNTERMEASURE RULE

Pub. L. 113–121, title I, §1049, June 10, 2014, 128 Stat. 1257, as amended by Pub. L. 114–322, title IV, §5011, Dec. 16, 2016, 130 Stat. 1902, provided that:

''(a) DEFINITIONS.—In this section:

''(1) ADMINISTRATOR.—The term 'Administrator' means the Administrator of the Environmental Protection Agency.

''(2) FARM.—The term 'farm' has the meaning given the term in section 112.2 of title 40, Code of Federal Regulations (or successor regulations).

''(3) GALLON.—The term 'gallon' means a United States gallon.

''(4) OIL.—The term 'oil' has the meaning given the term in section 112.2 of title 40, Code of Federal Regulations (or successor regulations).

''(5) OIL DISCHARGE.—The term 'oil discharge' has the meaning given the term 'discharge' in section 112.2 of title 40, Code of Federal Regulations (or successor regulations).

''(6) REPORTABLE OIL DISCHARGE HISTORY.—

''(A) IN GENERAL.—Subject to subparagraph (B), the term 'reportable oil discharge history' means a single oil discharge, as described in section 112.1(b) of title 40, Code of Federal Regulations (including successor regulations), that exceeds 1,000 gallons or 2 oil discharges, as described in section 112.1(b) of title 40, Code of Federal Regulations (including successor regulations), that each exceed 42 gallons within any 12-month period—

''(i) in the 3 years prior to the certification date of the Spill Prevention, Control, and Countermeasure plan (as described in section 112.3 of title 40, Code of Federal Regulations (including successor regulations); or

''(ii) since becoming subject to part 112 of title 40, Code of Federal Regulations, if the facility has been in operation for less than 3 years.

''(B) EXCLUSIONS.—The term 'reportable oil discharge history' does not include an oil discharge, as described in section 112.1(b) of title 40, Code of Federal Regulations (including successor regulations), that is the result of a natural disaster, an act of war, or terrorism.

''(7) SPILL PREVENTION, CONTROL, AND COUNTERMEASURE RULE.—The term 'Spill Prevention, Control, and Countermeasure rule' means the regulation, including amendments, promulgated by the Administrator under part 112 of title 40, Code of Federal Regulations (or successor regulations).

''(b) CERTIFICATION.—In implementing the Spill Prevention, Control, and Countermeasure rule with respect to any farm, the Administrator shall—

''(1) require certification by a professional engineer for a farm with—

''(A) an individual tank with an aboveground storage capacity greater than 10,000 gallons;

''(B) an aggregate aboveground storage capacity greater than or equal to 20,000 gallons; or

''(C) a reportable oil discharge history; or

''(2) allow certification by the owner or operator of the farm (via self-certification) for a farm with—

''(A) an aggregate aboveground storage capacity less than 20,000 gallons and greater than the lesser of—

''(i) 6,000 gallons; and

''(ii) the adjustment quantity established under subsection (d)(2); and

''(B) no reportable oil discharge history; and

''(3) not require compliance with the rule by any farm—

''(A) with an aggregate aboveground storage capacity greater than 2,500 gallons and less than the lesser of—

''(i) 6,000 gallons; and

''(ii) the adjustment quantity established under subsection (d)(2); and

''(B) no reportable oil discharge history; and

''(4) not require compliance with the rule by any farm with an aggregate aboveground storage capacity of less than 2,500 gallons.

''(c) REGULATION OF ABOVEGROUND STORAGE AT FARMS.—

''(1) CALCULATION OF AGGREGATE ABOVEGROUND STORAGE CAPACITY.—For purposes of subsection (b), the aggregate aboveground storage capacity of a farm excludes—

''(A) all containers on separate parcels that have a capacity that is 1,000 gallons or less; and

''(B) all containers holding animal feed ingredients approved for use in livestock feed by the Commissioner of Food and Drugs.

''(2) CERTAIN FARM CONTAINERS.—Part 112 of title 40, Code of Federal Regulations (or successor regulations), shall not apply to the following containers located at a farm:

''(A) Containers on a separate parcel that have—

''(i) an individual capacity of not greater than 1,000 gallons; and

''(ii) an aggregate capacity of not greater than 2,500 gallons.

''(B) A container holding animal feed ingredients approved for use in livestock feed by the Food and Drug Administration.

''(d) STUDY.—

''(1) IN GENERAL.—Not later than 1 year after the date of enactment of this Act [June 10, 2014], the Administrator, in consultation with the Secretary of Agriculture, shall conduct a study to determine the appropriate exemption under paragraphs (2) and (3) of subsection (b), which shall be not more than 6,000 gallons and not less than 2,500 gallons, based on a significant risk of discharge to water.

''(2) ADJUSTMENT.—Not later than 18 months after the date on which the study described in paragraph (1) is complete, the Administrator, in consultation with the Secretary of Agriculture, shall promulgate a rule to adjust the exemption levels described in paragraphs (2) and (3) of subsection (b) in accordance with the study.''

ENVIRONMENTAL COURT FEASIBILITY STUDY

Pub. L. 92–500, §9, Oct. 18, 1972, 86 Stat. 899, authorized the President, acting through the Attorney General, to study the feasibility of establishing a separate court or court system with jurisdiction over environmental matters and required him to report the results of his study, together with his recommendations, to Congress not later than one year after Oct. 18, 1972.

TRANSFER OF PUBLIC HEALTH SERVICE OFFICERS

Pub. L. 89–234, §2(b)–(k), Oct. 2, 1965, 79 Stat. 904, 905, authorized the transfer of certain commissioned officers of the Public Health Service to classified positions in the Federal Water Pollution Control Administration, now the Environmental Protection Agency, where such transfer was requested within six months after the establishment of the Administration and made certain administrative provisions relating to pension and retirement rights of the transferees, sick leave benefits, group life insurance, and certain other miscellaneous provisions.

## § 1362. Definitions

Except as otherwise specifically provided, when used in this chapter:

(1) The term ''State water pollution control agency'' means the State agency designated by the Governor having responsibility for enforcing State laws relating to the abatement of pollution.

(2) The term ''interstate agency'' means an agency of two or more States established by or pursuant to an agreement or compact approved



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by the Congress, or any other agency of two or more States, having substantial powers or duties pertaining to the control of pollution as determined and approved by the Administrator.

(3) The term ''State'' means a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the Trust Territory of the Pacific Islands.

(4) The term ''municipality'' means a city, town, borough, county, parish, district, association, or other public body created by or pursuant to State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 1288 of this title.

(5) The term ''person'' means an individual, corporation, partnership, association, State, municipality, commission, or political subdivision of a State, or any interstate body.

(6) The term ''pollutant'' means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. This term does not mean (A) ''sewage from vessels or a discharge incidental to the normal operation of a vessel of the Armed Forces'' within the meaning of section 1322 of this title; or (B) water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the State in which the well is located, and if such State determines that such injection or disposal will not result in the degradation of ground or surface water resources.

(7) The term ''navigable waters'' means the waters of the United States, including the territorial seas.

(8) The term ''territorial seas'' means the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles.

(9) The term ''contiguous zone'' means the entire zone established or to be established by the United States under article 24 of the Convention of the Territorial Sea and the Contiguous Zone.

(10) The term ''ocean'' means any portion of the high seas beyond the contiguous zone.

(11) The term ''effluent limitation'' means any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance.

(12) The term ''discharge of a pollutant'' and the term ''discharge of pollutants'' each means (A) any addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft.

(13) The term ''toxic pollutant'' means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring.

(14) The term ''point source'' means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

(15) The term ''biological monitoring'' shall mean the determination of the effects on aquatic life, including accumulation of pollutants in tissue, in receiving waters due to the discharge of pollutants (A) by techniques and procedures, including sampling of organisms representative of appropriate levels of the food chain appropriate to the volume and the physical, chemical, and biological characteristics of the effluent, and (B) at appropriate frequencies and locations.

(16) The term ''discharge'' when used without qualification includes a discharge of a pollutant, and a discharge of pollutants.

(17) The term ''schedule of compliance'' means a schedule of remedial measures including an enforceable sequence of actions or operations leading to compliance with an effluent limitation, other limitation, prohibition, or standard.

(18) The term ''industrial user'' means those industries identified in the Standard Industrial Classification Manual, Bureau of the Budget, 1967, as amended and supplemented, under the category of ''Division D—Manufacturing'' and such other classes of significant waste producers as, by regulation, the Administrator deems appropriate.

(19) The term ''pollution'' means the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water.

(20) The term ''medical waste'' means isolation wastes; infectious agents; human blood and blood products; pathological wastes; sharps; body parts; contaminated bedding; surgical wastes and potentially contaminated laboratory wastes; dialysis wastes; and such additional medical items as the Administrator shall prescribe by regulation.

(21) COASTAL RECREATION WATERS.—

(A) IN GENERAL.—The term ''coastal recreation waters'' means—

(i) the Great Lakes; and

(ii) marine coastal waters (including coastal estuaries) that are designated under section 1313(c) of this title by a State for use for



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**§ 1368. Federal procurement**

**(a) Contracts with violators prohibited**

No Federal agency may enter into any contract with any person, who has been convicted of any offense under section 1319(c) of this title, for the procurement of goods, materials, and services if such contract is to be performed at any facility at which the violation which gave rise to such conviction occurred, and if such facility is owned, leased, or supervised by such person. The prohibition in the preceding sentence shall continue until the Administrator certifies that the condition giving rise to such conviction has been corrected.

**(b) Notification of agencies**

The Administrator shall establish procedures to provide all Federal agencies with the notification necessary for the purposes of subsection (a) of this section.

**(c) Omitted**

**(d) Exemptions**

The President may exempt any contract, loan, or grant from all or part of the provisions of this section where he determines such exemption is necessary in the paramount interest of the United States and he shall notify the Congress of such exemption.

**(e) Annual report to Congress**

The President shall annually report to the Congress on measures taken in compliance with the purpose and intent of this section, including, but not limited to, the progress and problems associated with such compliance.

**(f) Contractor certification or contract clause in acquisition of commercial products or commercial services**

(1) No certification by a contractor, and no contract clause, may be required in the case of a contract for the acquisition of commercial products or commercial services in order to implement a prohibition or requirement of this section or a prohibition or requirement issued in the implementation of this section.

(2) In paragraph (1), the terms ''commercial product'' and ''commercial service'' have the meanings given those terms in sections 103 and 103a, respectively, of title 41.

(June 30, 1948, ch. 758, title V, § 508, as added Pub. L. 92–500, § 2, Oct. 18, 1972, 86 Stat. 891; amended Pub. L. 103–355, title VIII, § 8301(a), Oct. 13, 1994, 108 Stat. 3396; Pub. L. 115–232, div. A, title VIII, § 836(g)(5), Aug. 13, 2018, 132 Stat. 1873.)

**Editorial Notes**

CODIFICATION

Subsec. (c) of this section authorized the President to cause to be issued, not more than 180 days after October 18, 1972, an order (1) requiring each Federal agency authorized to enter into contracts or to extend Federal assistance by way of grant, loan, or contract, to effectuate the purpose and policy of this chapter, and (2) setting forth procedures, sanctions and penalties as the President determines necessary to carry out such requirement.

AMENDMENTS

2018—Subsec. (f)(1). Pub. L. 115–232, § 836(g)(5)(A), substituted ''commercial products or commercial services'' for ''commercial items''.

Subsec. (f)(2). Pub. L. 115–232, § 836(g)(5)(B), substituted ''the terms 'commercial product' and 'commercial service' have the meanings given those terms in sections 103 and 103a, respectively, of title 41.'' for ''the term 'commercial item' has the meaning given such term in section 103 of title 41.''

1994—Subsec. (f). Pub. L. 103–355 added subsec. (f).

**Statutory Notes and Related Subsidiaries**

EFFECTIVE DATE OF 2018 AMENDMENT

Amendment by Pub. L. 115–232 effective Jan. 1, 2020, subject to a savings provision, see section 836(h) of Pub. L. 115–232, set out as an Effective Date of 2018 Amendment; Savings Provision note under section 453b of Title 6, Domestic Security.

EFFECTIVE DATE OF 1994 AMENDMENT

For effective date and applicability of amendment by Pub. L. 103–355, see section 10001 of Pub. L. 103–355, set out as a note under section 8752 of Title 10, Armed Forces.

**Executive Documents**

ADMINISTRATION OF CHAPTER WITH RESPECT TO FEDERAL CONTRACTS, GRANTS, OR LOANS

For provisions concerning the administration of this chapter with respect to Federal contracts, grants, or loans, see Ex. Ord. No. 11738, Sept. 10, 1973, 38 F.R. 25161, set out as a note under section 7606 of Title 42, The Public Health and Welfare.

**§ 1369. Administrative procedure and judicial review**

**(a) Subpenas**

(1) For purposes of obtaining information under section 1315 of this title, or carrying out section 1367(e) of this title, the Administrator may issue subpenas for the attendance and testimony of witnesses and the production of relevant papers, books, and documents, and he may administer oaths. Except for effluent data, upon a showing satisfactory to the Administrator that such papers, books, documents, or information or particular part thereof, if made public, would divulge trade secrets or secret processes, the Administrator shall consider such record, report, or information or particular portion thereof confidential in accordance with the purposes of section 1905 of title 18, except that such paper, book, document, or information may be disclosed to other officers, employees, or authorized representatives of the United States concerned with carrying out this chapter, or when relevant in any proceeding under this chapter. Witnesses summoned shall be paid the same fees and mileage that are paid witnesses in the courts of the United States. In case of contumacy or refusal to obey a subpena served upon any person under this subsection, the district court of the United States for any district in which such person is found or resides or transacts business, upon application by the United States and after notice to such person, shall have jurisdiction to issue an order requiring such person to appear and give testimony before the Administrator, to appear and produce papers, books, and documents before the Administrator, or both, and any failure to obey such order of the court may be punished by such court as a contempt thereof.

(2) The district courts of the United States are authorized, upon application by the Adminis-



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trator, to issue subpenas for attendance and testimony of witnesses and the production of relevant papers, books, and documents, for purposes of obtaining information under sections 1314(b) and (c) of this title. Any papers, books, documents, or other information or part thereof, obtained by reason of such a subpena shall be subject to the same requirements as are provided in paragraph (1) of this subsection.

**(b) Review of Administrator's actions; selection of court; fees**

(1) Review of the Administrator's action (A) in promulgating any standard of performance under section 1316 of this title, (B) in making any determination pursuant to section 1316(b)(1)(C) of this title, (C) in promulgating any effluent standard, prohibition, or pretreatment standard under section 1317 of this title, (D) in making any determination as to a State permit program submitted under section 1342(b) of this title, (E) in approving or promulgating any effluent limitation or other limitation under section 1311, 1312, 1316, or 1345 of this title, (F) in issuing or denying any permit under section 1342 of this title, and (G) in promulgating any individual control strategy under section 1314(*l*) of this title, may be had by any interested person in the Circuit Court of Appeals of the United States for the Federal judicial district in which such person resides or transacts business which is directly affected by such action upon application by such person. Any such application shall be made within 120 days from the date of such determination, approval, promulgation, issuance or denial, or after such date only if such application is based solely on grounds which arose after such 120th day.

(2) Action of the Administrator with respect to which review could have been obtained under paragraph (1) of this subsection shall not be subject to judicial review in any civil or criminal proceeding for enforcement.

(3) AWARD OF FEES.—In any judicial proceeding under this subsection, the court may award costs of litigation (including reasonable attorney and expert witness fees) to any prevailing or substantially prevailing party whenever it determines that such award is appropriate.

(4) DISCHARGES INCIDENTAL TO NORMAL OPERATION OF VESSELS.—

(A) IN GENERAL.—Except as provided in subparagraph (B), any interested person may file a petition for review of a final agency action under section 1322(p) of this title of the Administrator or the Secretary of the department in which the Coast Guard is operating in accordance with the requirements of this subsection.

(B) VENUE EXCEPTION.—Subject to section 1322(p)(7)(C)(v) of this title, a petition for review of a final agency action under section 1322(p) of this title of the Administrator or the Secretary of the department in which the Coast Guard is operating may be filed only in the United States Court of Appeals for the District of Columbia Circuit.

**(c) Additional evidence**

In any judicial proceeding brought under subsection (b) of this section in which review is sought of a determination under this chapter required to be made on the record after notice and opportunity for hearing, if any party applies to the court for leave to adduce additional evidence, and shows to the satisfaction of the court that such additional evidence is material and that there were reasonable grounds for the failure to adduce such evidence in the proceeding before the Administrator, the court may order such additional evidence (and evidence in rebuttal thereof) to be taken before the Administrator, in such manner and upon such terms and conditions as the court may deem proper. The Administrator may modify his findings as to the facts, or make new findings, by reason of the additional evidence so taken and he shall file such modified or new findings, and his recommendation, if any, for the modification or setting aside of his original determination, with the return of such additional evidence.

(June 30, 1948, ch. 758, title V, § 509, as added Pub. L. 92–500, § 2, Oct. 18, 1972, 86 Stat. 891; amended Pub. L. 93–207, § 1(6), Dec. 28, 1973, 87 Stat. 906; Pub. L. 100–4, title III, § 308(b), title IV, § 406(d)(3), title V, § 505(a), (b), Feb. 4, 1987, 101 Stat. 39, 73, 75; Pub. L. 100–236, § 2, Jan. 8, 1988, 101 Stat. 1732; Pub. L. 115–282, title IX, § 903(c)(4), Dec. 4, 2018, 132 Stat. 4356.)

**Editorial Notes**

AMENDMENTS

2018—Subsec. (b)(4). Pub. L. 115–282 added par. (4).

1988—Subsec. (b)(3), (4). Pub. L. 100–236 redesignated par. (4) as (3) and struck out former par. (3) relating to venue, which provided for selection procedure in subpar. (A), administrative provisions in subpar. (B), and transfers in subpar. (C).

1987—Subsec. (b)(1). Pub. L. 100–4, §§ 308(b), 406(d)(3), 505(a), substituted ''transacts business which is directly affected by such action'' for ''transacts such business'', ''120'' for ''ninety'', and ''120th'' for ''ninetieth'', substituted ''1316, or 1345 of this title'' for ''or 1316 of this title'' in cl. (E), and added cl. (G).

Subsec. (b)(3), (4). Pub. L. 100–4, § 505(b), added pars. (3) and (4).

1973—Subsec. (b)(1)(C). Pub. L. 93–207 substituted ''pretreatment'' for ''treatment''.

**Statutory Notes and Related Subsidiaries**

EFFECTIVE DATE OF 1988 AMENDMENT

Amendment by Pub. L. 100–236 effective 180 days after Jan. 8, 1988, see section 3 of Pub. L. 100–236, set out as a note under section 2112 of Title 28, Judiciary and Judicial Procedure.

**§ 1370. State authority**

Except as expressly provided in this chapter, nothing in this chapter shall (1) preclude or deny the right of any State or political subdivision thereof or interstate agency to adopt or enforce (A) any standard or limitation respecting discharges of pollutants, or (B) any requirement respecting control or abatement of pollution; except that if an effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard, or standard of performance is in effect under this chapter, such State or political subdivision or interstate agency may not adopt or enforce any effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard, or standard of



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may allow the prevailing party, other than the United States, a reasonable attorney's fee against the United States as part of the costs. Nothing in this subsection precludes the award of attorney's fees available under any other provisions of the United States Code.

(Pub. L. 96–247, § 5, May 23, 1980, 94 Stat. 351; Pub. L. 104–134, title I, § 101[(a)] [title VIII, § 803(c)], Apr. 26, 1996, 110 Stat. 1321, 1321–71; renumbered title I, Pub. L. 104–140, § 1(a), May 2, 1996, 110 Stat. 1327.)

**Editorial Notes**

AMENDMENTS

1996—Subsec. (b)(1)(A). Pub. L. 104–134, § 101[(a)] [title VIII, § 803(c)(1)(A)], substituted ''the Attorney General'' for ''he'' in introductory provisions and in cl. (iii).

Subsec. (b)(1)(B). Pub. L. 104–134, § 101[(a)] [title VIII, § 803(c)(1)(A)], substituted ''the Attorney General'' for ''he''.

Subsec. (b)(2). Pub. L. 104–134, § 101[(a)] [title VIII, § 803(c)(1)(B)], amended par. (2) generally. Prior to amendment, par. (2) read as follows: ''Any certification made by the Attorney General pursuant to this subsection shall be personally signed by him.''

Subsec. (c). Pub. L. 104–134, § 101[(a)] [title VIII, § 803(c)(2)], amended subsec. (c) generally. Prior to amendment, subsec. (c) read as follows: ''Any motion to intervene made by the Attorney General pursuant to this section shall be personally signed by him.''

### § 1997d. Prohibition of retaliation

No person reporting conditions which may constitute a violation under this subchapter shall be subjected to retaliation in any manner for so reporting.

(Pub. L. 96–247, § 6, May 23, 1980, 94 Stat. 352.)

### § 1997e. Suits by prisoners

**(a) Applicability of administrative remedies**

No action shall be brought with respect to prison conditions under section 1983 of this title, or any other Federal law, by a prisoner confined in any jail, prison, or other correctional facility until such administrative remedies as are available are exhausted.

**(b) Failure of State to adopt or adhere to administrative grievance procedure**

The failure of a State to adopt or adhere to an administrative grievance procedure shall not constitute the basis for an action under section 1997a or 1997c of this title.

**(c) Dismissal**

(1) The court shall on its own motion or on the motion of a party dismiss any action brought with respect to prison conditions under section 1983 of this title, or any other Federal law, by a prisoner confined in any jail, prison, or other correctional facility if the court is satisfied that the action is frivolous, malicious, fails to state a claim upon which relief can be granted, or seeks monetary relief from a defendant who is immune from such relief.

(2) In the event that a claim is, on its face, frivolous, malicious, fails to state a claim upon which relief can be granted, or seeks monetary relief from a defendant who is immune from such relief, the court may dismiss the underlying claim without first requiring the exhaustion of administrative remedies.

**(d) Attorney's fees**

(1) In any action brought by a prisoner who is confined to any jail, prison, or other correctional facility, in which attorney's fees are authorized under section 1988[1] of this title, such fees shall not be awarded, except to the extent that—

(A) the fee was directly and reasonably incurred in proving an actual violation of the plaintiff's rights protected by a statute pursuant to which a fee may be awarded under section 1988[1] of this title; and

(B)(i) the amount of the fee is proportionately related to the court ordered relief for the violation; or

(ii) the fee was directly and reasonably incurred in enforcing the relief ordered for the violation.

(2) Whenever a monetary judgment is awarded in an action described in paragraph (1), a portion of the judgment (not to exceed 25 percent) shall be applied to satisfy the amount of attorney's fees awarded against the defendant. If the award of attorney's fees is not greater than 150 percent of the judgment, the excess shall be paid by the defendant.

(3) No award of attorney's fees in an action described in paragraph (1) shall be based on an hourly rate greater than 150 percent of the hourly rate established under section 3006A of title 18 for payment of court-appointed counsel.

(4) Nothing in this subsection shall prohibit a prisoner from entering into an agreement to pay an attorney's fee in an amount greater than the amount authorized under this subsection, if the fee is paid by the individual rather than by the defendant pursuant to section 1988[1] of this title.

**(e) Limitation on recovery**

No Federal civil action may be brought by a prisoner confined in a jail, prison, or other correctional facility, for mental or emotional injury suffered while in custody without a prior showing of physical injury or the commission of a sexual act (as defined in section 2246 of title 18).

**(f) Hearings**

(1) To the extent practicable, in any action brought with respect to prison conditions in Federal court pursuant to section 1983 of this title, or any other Federal law, by a prisoner confined in any jail, prison, or other correctional facility, pretrial proceedings in which the prisoner's participation is required or permitted shall be conducted by telephone, video conference, or other telecommunications technology without removing the prisoner from the facility in which the prisoner is confined.

(2) Subject to the agreement of the official of the Federal, State, or local unit of government with custody over the prisoner, hearings may be conducted at the facility in which the prisoner is confined. To the extent practicable, the court shall allow counsel to participate by telephone, video conference, or other communications technology in any hearing held at the facility.

**(g) Waiver of reply**

(1) Any defendant may waive the right to reply to any action brought by a prisoner confined in

[1] See References in Text note below.



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(c) *General Counsel* means the General Counsel of EPA or any official exercising authority delegated by the General Counsel.

[50 FR 7270, Feb. 21, 1985, as amended at 53 FR 29322, Aug. 3, 1988]

### § 23.2 Timing of Administrator's action under Clean Water Act.

Unless the Administrator otherwise explicity provides in a particular promulgation or approval action, the time and date of the Administrator's action in promulgation (for purposes of sections 509(b)(1) (A), (C), and (E)), approving (for purposes of section 509(b)(1)(E)), making a determination (for purposes of section 509(b)(1) (B) and (D), and issuing or denying (for purposes of section 509(b)(1)(F)) shall be at 1:00 p.m. eastern time (standard or daylight, as appropriate) on (a) for a FEDERAL REGISTER document, the date that is two weeks after the date when the document is published in the FEDERAL REGISTER, or (b) for any other document, two weeks after it is signed.

### § 23.3 Timing of Administrator's action under Clean Air Act.

Unless the Administrator otherwise explicitly provides in a particular promulgation, approval, or action, the time and date of such promulgation, approval or action for purposes of the second sentence of section 307(b)(1) shall be at 1:00 p.m. eastern time (standard or daylight, as appropriate) on (a) for a FEDERAL REGISTER document, the date when the document is published in the FEDERAL REGISTER, or (b) for any other document, two weeks after it is signed.

### § 23.4 Timing of Administrator's action under Resource Conservation and Recovery Act.

Unless the Administrator otherwise explicitly provides in taking a particular action, for purposes of section 7006(b), the time and date of the Administrator's action in issuing, denying, modifying, or revoking any permit under section 3005, or in granting, denying, or withdrawing authorization or interim authorization under section 3006, shall be at 1:00 p.m. eastern time (standard or daylight, as appropriate) on the date that is (a) for a FEDERAL REGISTER document, two weeks after the date when the document is published in the FEDERAL REGISTER, or (b) for any other document, two weeks after it is signed.

### § 23.5 Timing of Administrator's action under Toxic Substances Control Act.

Unless the Administrator otherwise explicitly provides in promulgating a particular rule or issuing a particular order, the time and date of the Administrator's promulgation or issuance for purposes of section 19(a)(1) shall be at 1:00 p.m. eastern time (standard or daylight, as appropriate) on the date that is (a) for a FEDERAL REGISTER document, two weeks after the date when the document is published in the FEDERAL REGISTER, or (b) for any other document, two weeks after it is signed.

### § 23.6 Timing of Administrator's action under Federal Insecticide, Fungicide and Rodenticide Act.

Unless the Administrator otherwise explicitly provides in a particular order, the time and date of entry of an order issued by the Administrator following a public hearing for purposes of section 16(b) shall be at 1:00 p.m. eastern time (standard or daylight, as appropriate) on the date that is two weeks after it is signed.

### § 23.7 Timing of Administrator's action under Safe Drinking Water Act.

Unless the Administrator otherwise explicitly provides in a particular promulgation action or determination, the time and date of the Administrator's promulgation, issuance, or determination for purposes of section 1448(a)(2) shall be at 1:00 p.m. eastern time (standard or daylight, as appropriate) on the date that is (a) for a FEDERAL REGISTER document, two weeks after the date when the document is published in the FEDERAL REGISTER or (b) for any other document, two weeks after it is signed.

### § 23.8 Timing of Administrator's action under Uranium Mill Tailings Radiation Control Act of 1978.

Unless the Administrator otherwise explicitly provides in a particular rule, the time and date of the Administrator's promulgation for purposes of 42





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55. Polynuclear aromatic hydrocarbons (including benzanthracenes, benzopyrenes, benzofluoranthene, chrysenes, dibenzanthracenes, and indenopyrenes)
56. Selenium and compounds
57. Silver and compounds
58. 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)
59. Tetrachloroethylene
60. Thallium and compounds
61. Toluene
62. Toxaphene[1]
63. Trichloroethylene
64. Vinyl chloride
65. Zinc and compounds

[44 FR 44502, July 30, 1979, as amended at 46 FR 2266, Jan. 8, 1981; 46 FR 10724, Feb. 4, 1981]

### § 401.16 Conventional pollutants.

The following comprise the list of conventional pollutants designated pursuant to section 304(a)(4) of the Act:

1. Biochemical oxygen demand (BOD)
2. Total suspended solids (nonfilterable) (TSS)
3. pH
4. Fecal coliform
5. Oil and grease

[44 FR 44503, July 30, 1979; 44 FR 52685, Sept. 10, 1979]

### § 401.17 pH Effluent limitations under continuous monitoring.

(a) Where a permittee continuously measures the pH of wastewater pursuant to a requirement or option in a National Pollutant Discharge Elimination System (NPDES) permit issued pursuant to section 402 of the Act, the permittee shall maintain the pH of such wastewater within the range set forth in the applicable effluent limitations guidelines, except excursions from the range are permitted subject to the following limitations:

(1) The total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month; and

(2) No individual excursion from the range of pH values shall exceed 60 minutes.

(b) The Director, as defined in § 122.3 of this chapter, may adjust the requirements set forth in paragraph (a) of this section with respect to the length of individual excursions from the range of pH values, if a different period of time is appropriate based upon the treatment system, plant configuration or other technical factors.

(c) For purposes of this section, an *excursion* is an unintentional and temporary incident in which the pH value of discharge wastewater exceeds the range set forth in the applicable effluent limitations guidelines.

(Secs. 301, 304, 306 and 501 of the Clean Water Act (the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1251 et. seq., as amended by the Clean Water Act of 1977, Pub. L. 95–217))

[47 FR 24537, June 4, 1982]

## PART 402 [RESERVED]

# PART 403—GENERAL PRETREATMENT REGULATIONS FOR EXISTING AND NEW SOURCES OF POLLUTION

Sec.

403.1 Purpose and applicability.
403.2 Objectives of general pretreatment regulations.
403.3 Definitions.
403.4 State or local law.
403.5 National pretreatment standards: Prohibited discharges.
403.6 National pretreatment standards: Categorical standards.
403.7 Removal credits.
403.8 Pretreatment Program Requirements: Development and Implementation by POTW.
403.9 POTW pretreatment programs and/or authorization to revise pretreatment standards: Submission for approval.
403.10 Development and submission of NPDES State pretreatment programs.
403.11 Approval procedures for POTW pretreatment programs and POTW granting of removal credits.
403.12 Reporting requirements for POTW's and industrial users.
403.13 Variances from categorical pretreatment standards for fundamentally different factors.
403.14 Confidentiality.
403.15 Net/Gross calculation.
403.16 Upset provision.
403.17 Bypass.
403.18 Modification of POTW pretreatment programs.
403.19 Provisions of specific applicability to the Owatonna Waste Water Treatment Facility.
403.20 Pretreatment Program Reinvention Pilot Projects Under Project XL.

APPENDIXES A–C TO PART 403 [RESERVED]
APPENDIX D TO PART 403—SELECTED INDUSTRIAL SUBCATEGORIES CONSIDERED DILUTE



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FOR PURPOSES OF THE COMBINED WASTESTREAM FORMULA
APPENDIX E TO PART 403—SAMPLING PROCEDURES
APPENDIX F TO PART 403 [RESERVED]
APPENDIX G TO PART 403—POLLUTANTS ELIGIBLE FOR A REMOVAL CREDIT

AUTHORITY: 33 U.S.C. 1251 *et seq.*

SOURCE: 46 FR 9439, Jan. 28, 1981, unless otherwise noted.

### § 403.1 Purpose and applicability.

(a) This part implements sections 204(b)(1)(C), 208(b)(2)(C)(iii), 301(b)(1)(A)(ii), 301(b)(2)(A)(ii), 301(h)(5) and 301(i)(2), 304 (e) and (g), 307, 308, 309, 402(b), 405, and 501(a) of the Federal Water Pollution Control Act as amended by the Clean Water Act of 1977 (Pub. L. 95–217) or ''The Act''. It establishes responsibilities of Federal, State, and local government, industry and the public to implement National Pretreatment Standards to control pollutants which pass through or interfere with treatment processes in Publicly Owned Treatment Works (POTWs) or which may contaminate sewage sludge.

(b) This regulation applies:

(1) To pollutants from non-domestic sources covered by Pretreatment Standards which are indirectly discharged into or transported by truck or rail or otherwise introduced into POTWs as defined below in § 403.3;

(2) To POTWs which receive wastewater from sources subject to National Pretreatment Standards;

(3) To States which have or are applying for National Pollutant Discharge Elimination System (NPDES) programs approved in accordance with section 402 of the Act; and

(4) To any new or existing source subject to Pretreatment Standards. National Pretreatment Standards do not apply to sources which Discharge to a sewer which is not connected to a POTW Treatment Plant.

[46 FR 9439, Jan. 28, 1981, as amended at 48 FR 2776, Jan. 21, 1983; 60 FR 33932, June 29, 1995]

### § 403.2 Objectives of general pretreatment regulations.

By establishing the responsibilities of government and industry to implement National Pretreatment Standards this regulation fulfills three objectives:

(a) To prevent the introduction of pollutants into POTWs which will interfere with the operation of a POTW, including interference with its use or disposal of municipal sludge;

(b) To prevent the introduction of pollutants into POTWs which will pass through the treatment works or otherwise be incompatible with such works; and

(c) To improve opportunities to recycle and reclaim municipal and industrial wastewaters and sludges.

### § 403.3 Definitions.

For the purposes of this part:

(a) Except as discussed below, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 shall apply to this regulation.

(b) The term *Act* means Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 U.S.C. 1251, *et seq.*

(c) The term *Approval Authority* means the Director in an NPDES State with an approved State pretreatment program and the appropriate Regional Administrator in a non-NPDES State or NPDES State without an approved State pretreatment program.

(d) The term *Approved POTW Pretreatment Program* or *Program* or *POTW Pretreatment Program* means a program administered by a POTW that meets the criteria established in this regulation (§§ 403.8 and 403.9) and which has been approved by a Regional Administrator or State Director in accordance with § 403.11 of this regulation.

(e) The term *Best Management Practices* or *BMPs* means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to implement the prohibitions listed in § 403.5(a)(1) and (b). BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.

(f) The term *Control Authority* refers to:

(1) The POTW if the POTW's Pretreatment Program Submission has been approved in accordance with the requirements of § 403.11; or



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(ii) Entered into a binding contractual obligation for the purchase of facilities or equipment which are intended to be used in its operation within a reasonable time. Options to purchase or contracts which can be terminated or modified without substantial loss, and contracts for feasibility, engineering, and design studies do not constitute a contractual obligation under this paragraph.

(n) The terms *NPDES Permit* or *Permit* means a permit issued to a POTW pursuant to section 402 of the Act.

(o) The term *NPDES State* means a State (as defined in 40 CFR 122.2) or Interstate water pollution control agency with an NPDES permit program approved pursuant to section 402(b) of the Act.

(p) The term *Pass Through* means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

(q) The term *Publicly Owned Treatment Works* or *POTW* means a treatment works as defined by section 212 of the Act, which is owned by a State or municipality (as defined by section 502(4) of the Act). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in section 502(4) of the Act, which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works.

(r) The term *POTW Treatment Plant* means that portion of the POTW which is designed to provide treatment (including recycling and reclamation) of municipal sewage and industrial waste.

(s) The term *Pretreatment* means the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. The reduction or alteration may be obtained by physical, chemical or biological processes, process changes or by other means, except as prohibited by § 403.6(d). Appropriate pretreatment technology includes control equipment, such as equalization tanks or facilities, for protection against surges or slug loadings that might interfere with or otherwise be incompatible with the POTW. However, where wastewater from a regulated process is mixed in an equalization facility with unregulated wastewater or with wastewater from another regulated process, the effluent from the equalization facility must meet an adjusted pretreatment limit calculated in accordance with § 403.6(e).

(t) The term *Pretreatment requirements* means any substantive or procedural requirement related to Pretreatment, other than a National Pretreatment Standard, imposed on an Industrial User.

(u) The term *Regional Administrator* means the appropriate EPA Regional Administrator.

(v) *Significant Industrial User*. (1) Except as provided in paragraphs (v)(2) and (v)(3) of this section, the term Significant Industrial User means:

(i) All Industrial Users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR chapter I, subchapter N; and

(ii) Any other Industrial User that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW Treatment plant; or is designated as such by the Control Authority on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

(2) The Control Authority may determine that an Industrial User subject to categorical Pretreatment Standards



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sewer overflow requirements that conform to the Combined Sewer Overflow Control Policy.

[49 FR 31221, Aug. 3, 1984, as amended at 51 FR 20430, June 4, 1986; 53 FR 42435, Nov. 5, 1987; 58 FR 9386, Feb. 19, 1993; 58 FR 18017, Apr. 7, 1993; 70 FR 60193, Oct. 14, 2005]

### § 403.8 Pretreatment Program Requirements: Development and Implementation by POTW.

(a) *POTWs required to develop a pretreatment program.* Any POTW (or combination of POTWs operated by the same authority) with a total design flow greater than 5 million gallons per day (mgd) and receiving from Industrial Users pollutants which Pass Through or Interfere with the operation of the POTW or are otherwise subject to Pretreatment Standards will be required to establish a POTW Pretreatment Program unless the NPDES State exercises its option to assume local responsibilities as provided for in § 403.10(e). The Regional Administrator or Director may require that a POTW with a design flow of 5 mgd or less develop a POTW Pretreatment Program if he or she finds that the nature or volume of the industrial influent, treatment process upsets, violations of POTW effluent limitations, contamination of municipal sludge, or other circumstances warrant in order to prevent Interference with the POTW or Pass Through.

(b) *Deadline for Program Approval.* A POTW which meets the criteria of paragraph (a) of this section must receive approval of a POTW Pretreatment Program no later than 3 years after the reissuance or modification of its existing NPDES permit but in no case later than July 1, 1983. POTWs whose NPDES permits are modified under section 301(h) of the Act shall have a Pretreatment Program within three (3) years as provided for in 40 CFR part 125, subpart G. POTWs identified after July 1, 1983 as being required to develop a POTW Pretreatment Program under paragraph (a) of this section shall develop and submit such a program for approval as soon as possible, but in no case later than one year after written notification from the Approval Authority of such identification. The POTW Pretreatment Program shall meet the criteria set forth in paragraph (f) of this section and shall be administered by the POTW to ensure compliance by Industrial Users with applicable Pretreatment Standards and Requirements.

(c) *Incorporation of approved programs in permits.* A POTW may develop an appropriate POTW Pretreatment Program any time before the time limit set forth in paragraph (b) of this section. The POTW's NPDES Permit will be reissued or modified by the NPDES State or EPA to incorporate the approved Program as enforceable conditions of the Permit. The modification of a POTW's NPDES Permit for the purposes of incorporating a POTW Pretreatment Program approved in accordance with the procedure in § 403.11 shall be deemed a minor Permit modification subject to the procedures in 40 CFR 122.63.

(d) *Incorporation of compliance schedules in permits.* [Reserved]

(e) *Cause for reissuance or modification of Permits.* Under the authority of section 402(b)(1)(C) of the Act, the Approval Authority may modify, or alternatively, revoke and reissue a POTW's Permit in order to:

(1) Put the POTW on a compliance schedule for the development of a POTW Pretreatment Program where the addition of pollutants into a POTW by an Industrial User or combination of Industrial Users presents a substantial hazard to the functioning of the treatment works, quality of the receiving waters, human health, or the environment;

(2) Coordinate the issuance of a section 201 construction grant with the incorporation into a permit of a compliance schedule for POTW Pretreatment Program;

(3) Incorporate a modification of the permit approved under section 301(h) or 301(i) of the Act;

(4) Incorporate an approved POTW Pretreatment Program in the POTW permit; or

(5) Incorporate a compliance schedule for the development of a POTW pretreatment program in the POTW permit.



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(6) Incorporate the removal credits (established under § 403.7) in the POTW permit.

(f) *POTW pretreatment requirements.* A POTW pretreatment program must be based on the following legal authority and include the following procedures. These authorities and procedures shall at all times be fully and effectively exercised and implemented.

(1) *Legal authority.* The POTW shall operate pursuant to legal authority enforceable in Federal, State or local courts, which authorizes or enables the POTW to apply and to enforce the requirements of sections 307 (b) and (c), and 402(b)(8) of the Act and any regulations implementing those sections. Such authority may be contained in a statute, ordinance, or series of contracts or joint powers agreements which the POTW is authorized to enact, enter into or implement, and which are authorized by State law. At a minimum, this legal authority shall enable the POTW to:

(i) Deny or condition new or increased contributions of pollutants, or changes in the nature of pollutants, to the POTW by Industrial Users where such contributions do not meet applicable Pretreatment Standards and Requirements or where such contributions would cause the POTW to violate its NPDES permit;

(ii) Require compliance with applicable Pretreatment Standards and Requirements by Industrial Users;

(iii) Control through Permit, order, or similar means, the contribution to the POTW by each Industrial User to ensure compliance with applicable Pretreatment Standards and Requirements. In the case of Industrial Users identified as significant under § 403.3(v), this control shall be achieved through individual permits or equivalent individual control mechanisms issued to each such User except as follows.

(A)(*1*) At the discretion of the POTW, this control may include use of general control mechanisms if the following conditions are met. All of the facilities to be covered must:

(*i*) Involve the same or substantially similar types of operations;

(*ii*) Discharge the same types of wastes;

(*iii*) Require the same effluent limitations;

(*iv*) Require the same or similar monitoring; and

(*v*) In the opinion of the POTW, are more appropriately controlled under a general control mechanism than under individual control mechanisms.

(*2*) To be covered by the general control mechanism, the Significant Industrial User must file a written request for coverage that identifies its contact information, production processes, the types of wastes generated, the location for monitoring all wastes covered by the general control mechanism, any requests in accordance with § 403.12(e)(2) for a monitoring waiver for a pollutant neither present nor expected to be present in the Discharge, and any other information the POTW deems appropriate. A monitoring waiver for a pollutant neither present nor expected to be present in the Discharge is not effective in the general control mechanism until after the POTW has provided written notice to the Significant Industrial User that such a waiver request has been granted in accordance with § 403.12(e)(2). The POTW must retain a copy of the general control mechanism, documentation to support the POTW's determination that a specific Significant Industrial User meets the criteria in paragraphs (f)(1)(iii)(A)(*1*) through (*5*) of this section, and a copy of the User's written request for coverage for 3 years after the expiration of the general control mechanism. A POTW may not control a Significant Industrial User through a general control mechanism where the facility is subject to production-based categorical Pretreatment Standards or categorical Pretreatment Standards expressed as mass of pollutant discharged per day or for Industrial Users whose limits are based on the Combined Wastestream Formula or Net/Gross calculations (§§ 403.6(e) and 403.15).

(B) Both individual and general control mechanisms must be enforceable and contain, at a minimum, the following conditions:

(*1*) Statement of duration (in no case more than five years);

(*2*) Statement of non-transferability without, at a minimum, prior notification to the POTW and provision of a



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copy of the existing control mechanism to the new owner or operator;

(*3*) Effluent limits, including Best Management Practices, based on applicable general Pretreatment Standards in part 403 of this chapter, categorical Pretreatment Standards, local limits, and State and local law;

(*4*) Self-monitoring, sampling, reporting, notification and recordkeeping requirements, including an identification of the pollutants to be monitored (including the process for seeking a waiver for a pollutant neither present nor expected to be present in the Discharge in accordance with § 403.12(e)(2), or a specific waived pollutant in the case of an individual control mechanism), sampling location, sampling frequency, and sample type, based on the applicable general Pretreatment Standards in part 403 of this chapter, categorical Pretreatment Standards, local limits, and State and local law;

(*5*) Statement of applicable civil and criminal penalties for violation of Pretreatment Standards and requirements, and any applicable compliance schedule. Such schedules may not extend the compliance date beyond applicable federal deadlines;

(*6*) Requirements to control Slug Discharges, if determined by the POTW to be necessary.

(iv) Require (A) the development of a compliance schedule by each Industrial User for the installation of technology required to meet applicable Pretreatment Standards and Requirements and (B) the submission of all notices and self-monitoring reports from Industrial Users as are necessary to assess and assure compliance by Industrial Users with Pretreatment Standards and Requirements, including but not limited to the reports required in § 403.12.

(v) Carry out all inspection, surveillance and monitoring procedures necessary to determine, independent of information supplied by Industrial Users, compliance or noncompliance with applicable Pretreatment Standards and Requirements by Industrial Users. Representatives of the POTW shall be authorized to enter any premises of any Industrial User in which a Discharge source or treatment system is located or in which records are required to be kept under § 403.12(o) to assure compliance with Pretreatment Standards. Such authority shall be at least as extensive as the authority provided under section 308 of the Act;

(vi)(A) Obtain remedies for noncompliance by any Industrial User with any Pretreatment Standard and Requirement. All POTW's shall be able to seek injunctive relief for noncompliance by Industrial Users with Pretreatment Standards and Requirements. All POTWs shall also have authority to seek or assess civil or criminal penalties in at least the amount of $1,000 a day for each violation by Industrial Users of Pretreatment Standards and Requirements.

(B) Pretreatment requirements which will be enforced through the remedies set forth in paragraph (f)(1)(vi)(A) of this section, will include but not be limited to, the duty to allow or carry out inspections, entry, or monitoring activities; any rules, regulations, or orders issued by the POTW; any requirements set forth in control mechanisms issued by the POTW; or any reporting requirements imposed by the POTW or these regulations in this part. The POTW shall have authority and procedures (after informal notice to the discharger) immediately and effectively to halt or prevent any discharge of pollutants to the POTW which reasonably appears to present an imminent endangerment to the health or welfare of persons. The POTW shall also have authority and procedures (which shall include notice to the affected industrial users and an opportunity to respond) to halt or prevent any discharge to the POTW which presents or may present an endangerment to the environment or which threatens to interfere with the operation of the POTW. The Approval Authority shall have authority to seek judicial relief and may also use administrative penalty authority when the POTW has sought a monetary penalty which the Approval Authority believes to be insufficient.

(vii) Comply with the confidentiality requirements set forth in § 403.14.

(2) *Procedures*. The POTW shall develop and implement procedures to ensure compliance with the requirements



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of a Pretreatment Program. At a minimum, these procedures shall enable the POTW to:

(i) Identify and locate all possible Industrial Users which might be subject to the POTW Pretreatment Program. Any compilation, index or inventory of Industrial Users made under this paragraph shall be made available to the Regional Administrator or Director upon request;

(ii) Identify the character and volume of pollutants contributed to the POTW by the Industrial Users identified under paragraph (f)(2)(i) of this section. This information shall be made available to the Regional Administrator or Director upon request;

(iii) Notify Industrial Users identified under paragraph (f)(2)(i) of this section, of applicable Pretreatment Standards and any applicable requirements under sections 204(b) and 405 of the Act and subtitles C and D of the Resource Conservation and Recovery Act. Within 30 days of approval pursuant to 40 CFR 403.8(f)(6), of a list of significant industrial users, notify each significant industrial user of its status as such and of all requirements applicable to it as a result of such status.

(iv) Receive and analyze self-monitoring reports and other notices submitted by Industrial Users in accordance with the self-monitoring requirements in § 403.12;

(v) Randomly sample and analyze the effluent from Industrial Users and conduct surveillance activities in order to identify, independent of information supplied by Industrial Users, occasional and continuing noncompliance with Pretreatment Standards. Inspect and sample the effluent from each Significant Industrial User at least once a year, except as otherwise specified below:

(A) Where the POTW has authorized the Industrial User subject to a categorical Pretreatment Standard to forego sampling of a pollutant regulated by a categorical Pretreatment Standard in accordance with § 403.12(e)(3), the POTW must sample for the waived pollutant(s) at least once during the term of the Categorical Industrial User's control mechanism. In the event that the POTW subsequently determines that a waived pollutant is present or is expected to be present in the Industrial User's wastewater based on changes that occur in the User's operations, the POTW must immediately begin at least annual effluent monitoring of the User's Discharge and inspection.

(B) Where the POTW has determined that an Industrial User meets the criteria for classification as a Non-Significant Categorical Industrial User, the POTW must evaluate, at least once per year, whether an Industrial User continues to meet the criteria in § 403.3(v)(2).

(C) In the case of Industrial Users subject to reduced reporting requirements under § 403.12(e)(3), the POTW must randomly sample and analyze the effluent from Industrial Users and conduct inspections at least once every two years. If the Industrial User no longer meets the conditions for reduced reporting in § 403.12(e)(3), the POTW must immediately begin sampling and inspecting the Industrial User at least once a year.

(vi) Evaluate whether each such Significant Industrial User needs a plan or other action to control Slug Discharges. For Industrial Users identified as significant prior to November 14, 2005, this evaluation must have been conducted at least once by October 14, 2006; additional Significant Industrial Users must be evaluated within 1 year of being designated a Significant Industrial User. For purposes of this subsection, a Slug Discharge is any Discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch Discharge, which has a reasonable potential to cause Interference or Pass Through, or in any other way violate the POTW's regulations, local limits or Permit conditions. The results of such activities shall be available to the Approval Authority upon request. Significant Industrial Users are required to notify the POTW immediately of any changes at its facility affecting potential for a Slug Discharge. If the POTW decides that a slug control plan is needed, the plan shall contain, at a minimum, the following elements:

(A) Description of discharge practices, including non-routine batch Discharges;



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(B) Description of stored chemicals;

(C) Procedures for immediately notifying the POTW of Slug Discharges, including any Discharge that would violate a prohibition under § 403.5(b) with procedures for follow-up written notification within five days;

(D) If necessary, procedures to prevent adverse impact from accidental spills, including inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site run-off, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants (including solvents), and/or measures and equipment for emergency response;

(vii) Investigate instances of noncompliance with Pretreatment Standards and Requirements, as indicated in the reports and notices required under § 403.12, or indicated by analysis, inspection, and surveillance activities described in paragraph (f)(2)(v) of this section. Sample taking and analysis and the collection of other information shall be performed with sufficient care to produce evidence admissible in enforcement proceedings or in judicial actions; and

(viii) Comply with the public participation requirements of 40 CFR part 25 in the enforcement of National Pretreatment Standards. These procedures shall include provision for at least annual public notification in a newspaper(s) of general circulation that provides meaningful public notice within the jurisdiction(s) served by the POTW of Industrial Users which, at any time during the previous 12 months, were in significant noncompliance with applicable Pretreatment requirements. For the purposes of this provision, a Significant Industrial User (or any Industrial User which violates paragraphs (f)(2)(viii)(C), (D), or (H) of this section) is in significant noncompliance if its violation meets one or more of the following criteria:

(A) Chronic violations of wastewater Discharge limits, defined here as those in which 66 percent or more of all of the measurements taken for the same pollutant parameter during a 6-month period exceed (by any magnitude) a numeric Pretreatment Standard or Requirement, including instantaneous limits, as defined by 40 CFR 403.3(l);

(B) Technical Review Criteria (TRC) violations, defined here as those in which 33 percent or more of all of the measurements taken for the same pollutant parameter during a 6-month period equal or exceed the product of the numeric Pretreatment Standard or Requirement including instantaneous limits, as defined by 40 CFR 403.3(l) multiplied by the applicable TRC (TRC = 1.4 for BOD, TSS, fats, oil, and grease, and 1.2 for all other pollutants except pH);

(C) Any other violation of a Pretreatment Standard or Requirement as defined by 40 CFR 403.3(l) (daily maximum, long-term average, instantaneous limit, or narrative Standard) that the POTW determines has caused, alone or in combination with other Discharges, Interference or Pass Through (including endangering the health of POTW personnel or the general public);

(D) Any discharge of a pollutant that has caused imminent endangerment to human health, welfare or to the environment or has resulted in the POTW's exercise of its emergency authority under paragraph (f)(1)(vi)(B) of this section to halt or prevent such a discharge;

(E) Failure to meet, within 90 days after the schedule date, a compliance schedule milestone contained in a local control mechanism or enforcement order for starting construction, completing construction, or attaining final compliance;

(F) Failure to provide, within 45 days after the due date, required reports such as baseline monitoring reports, 90-day compliance reports, periodic self-monitoring reports, and reports on compliance with compliance schedules;

(G) Failure to accurately report noncompliance;

(H) Any other violation or group of violations, which may include a violation of Best Management Practices, which the POTW determines will adversely affect the operation or implementation of the local Pretreatment program.

(3) *Funding.* The POTW shall have sufficient resources and qualified personnel to carry out the authorities and



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procedures described in paragraphs (f)(1) and (2) of this section. In some limited circumstances, funding and personnel may be delayed where (i) the POTW has adequate legal authority and procedures to carry out the Pretreatment Program requirements described in this section, and (ii) a limited aspect of the Program does not need to be implemented immediately (see § 403.9(b)).

(4) *Local limits.* The POTW shall develop local limits as required in § 403.5(c)(1), or demonstrate that they are not necessary.

(5) The POTW shall develop and implement an enforcement response plan. This plan shall contain detailed procedures indicating how a POTW will investigate and respond to instances of industrial user noncompliance. The plan shall, at a minimum:

(i) Describe how the POTW will investigate instances of noncompliance;

(ii) Describe the types of escalating enforcement responses the POTW will take in response to all anticipated types of industrial user violations and the time periods within which responses will take place;

(iii) Identify (by title) the official(s) responsible for each type of response;

(iv) Adequately reflect the POTW's primary responsibility to enforce all applicable pretreatment requirements and standards, as detailed in 40 CFR 403.8 (f)(1) and (f)(2).

(6) The POTW shall prepare and maintain a list of its Industrial Users meeting the criteria in § 403.3(v)(1). The list shall identify the criteria in § 403.3(v)(1) applicable to each Industrial User and, where applicable, shall also indicate whether the POTW has made a determination pursuant to § 403.3(v)(2) that such Industrial User should not be considered a Significant Industrial User. The initial list shall be submitted to the Approval Authority pursuant to § 403.9 or as a non-substantial modification pursuant to § 403.18(d). Modifications to the list shall be submitted to the Approval Authority pursuant to § 403.12(i)(1).

(g) A POTW that chooses to receive electronic documents must satisfy the requirements of 40 CFR part 3—(Electronic reporting).

[46 FR 9439, Jan. 28, 1981, as amended at 49 FR 31224, Aug. 3, 1984; 51 FR 20429, 20430, June 4, 1986; 51 FR 23759, July 1, 1986; 53 FR 40612, Oct. 17, 1988; 55 FR 30129, July 24, 1990; 58 FR 18017, Apr. 7, 1993; 60 FR 33932, June 29, 1995; 62 FR 38414, July 17, 1997; 70 FR 59889, Oct. 13, 2005; 70 FR 60193, Oct. 14, 2005]

### § 403.9 POTW pretreatment programs and/or authorization to revise pretreatment standards: Submission for approval.

(a) *Who approves Program.* A POTW requesting approval of a POTW Pretreatment Program shall develop a program description which includes the information set forth in paragraphs (b)(1) through (4) of this section. This description shall be submitted to the Approval Authority which will make a determination on the request for program approval in accordance with the procedures described in § 403.11.

(b) *Contents of POTW program submission.* The program description must contain the following information:

(1) A statement from the City Solicitor or a city official acting in a comparable capacity (or the attorney for those POTWs which have independent legal counsel) that the POTW has authority adequate to carry out the programs described in § 403.8. This statement shall:

(i) Identify the provision of the legal authority under § 403.8(f)(1) which provides the basis for each procedure under § 403.8(f)(2);

(ii) Identify the manner in which the POTW will implement the program requirements set forth in § 403.8, including the means by which Pretreatment Standards will be applied to individual Industrial Users (e.g., by order, permit, ordinance, etc.); and,

(iii) Identify how the POTW intends to ensure compliance with Pretreatment Standards and Requirements, and to enforce them in the event of noncompliance by Industrial Users;

(2) A copy of any statutes, ordinances, regulations, agreements, or other authorities relied upon by the POTW for its administration of the Program. This Submission shall include a statement reflecting the endorsement or approval of the local



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Code of Federal Regulations
Title 40. Protection of Environment
Chapter I. Environmental Protection Agency (Refs & Annos)
Subchapter N. Effluent Guidelines and Standards
Part 423. Steam Electric Power Generating Point Source Category (Refs & Annos)

40 C.F.R. § 423.11

§ 423.11 Specialized definitions.

Effective: July 8, 2024
Currentness

In addition to the definitions set forth in 40 CFR part 401, the following definitions apply to this part:

(a) The term total residual chlorine (or total residual oxidants for intake water with bromides) means the value obtained using any of the "chlorine—total residual" methods in Table IB in 40 CFR 136.3(a), or other methods approved by the permitting authority.

(b) The term low volume waste sources means, taken collectively as if from one source, wastewater from all sources except those for which specific limitations or standards are otherwise established in this part. Low volume waste sources include, but are not limited to, the following: Wastewaters from ion exchange water treatment systems, water treatment evaporator blowdown, laboratory and sampling streams, boiler blowdown, floor drains, cooling tower basin cleaning wastes, recirculating house service water systems, and wet scrubber air pollution control systems whose primary purpose is particulate removal. Sanitary wastes, air conditioning wastes, and wastewater from carbon capture or sequestration systems are not included in this definition.

(c) The term chemical metal cleaning waste means any wastewater resulting from the cleaning of any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning.

(d) The term metal cleaning waste means any wastewater resulting from cleaning [with or without chemical cleaning compounds] any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning.

(e) The term fly ash means the ash that is carried out of the furnace by a gas stream and collected by a capture device such as a mechanical precipitator, electrostatic precipitator, or fabric filter. Economizer ash is included in this definition when it is collected with fly ash. Ash is not included in this definition when it is collected in wet scrubber air pollution control systems whose primary purpose is particulate removal.

(f) The term bottom ash means the ash, including boiler slag, which settles in the furnace or is dislodged from furnace walls. Economizer ash is included in this definition when it is collected with bottom ash.

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duration discharges of wastewater from minor leaks (e.g., leaks from valve packing, pipe flanges, or piping), minor maintenance events (e.g., replacement of valves or pipe sections), FGD paste equipment cleaning water, bottom ash purge water, wastewater removed from ash handling equipment within the first 120 days of decommissioning the equipment, or wastewater generated by a 10–year, 24–hour or longer duration storm event when meeting the certification requirements in § 423.19(o).

(q) The term gasification wastewater means any wastewater generated at an integrated gasification combined cycle operation from the gasifier or the syngas cleaning, combustion, and cooling processes. Gasification wastewater includes, but is not limited to the following: Sour/grey water; $CO_2$/steam stripper wastewater; sulfur recovery unit blowdown, and wastewater resulting from slag handling or fly ash handling, particulate removal, halogen removal, or trace organic removal. Air separation unit blowdown, noncontact cooling water, and runoff from fuel and/or byproduct piles are not considered gasification wastewater. Wastewater that is collected intermittently in floor drains in the gasification process area from leaks, spills, and cleaning occurring during normal operation of the gasification operation is not considered gasification wastewater.

(r) The term combustion residual leachate means leachate from landfills or surface impoundments containing combustion residuals. Leachate is composed of liquid, including any suspended or dissolved constituents in the liquid, that has percolated through waste or other materials emplaced in a landfill, or that passes through the surface impoundment's containment structure (e.g., bottom, dikes, berms). Combustion residual leachate includes seepage and/or leakage from a combustion residual landfill or impoundment unit. Combustion residual leachate includes wastewater from landfills and surface impoundments located on non-adjoining property when under the operational control of the permitted facility. Combustion residual leachate does not include wastewater generated by a 10–year, 24–hour or longer duration storm event when meeting the certification requirements in § 423.19(o).

(s) The term oil-fired unit means a generating unit that uses oil as the primary or secondary fuel source and does not use a gasification process or any coal or petroleum coke as a fuel source. This definition does not include units that use oil only for start up or flame-stabilization purposes.

(t) The phrase “as soon as possible” means November 1, 2018 (except for purposes of § 423.13(g)(1)(i) and (k)(1)(i), in which case it means October 13, 2021), unless the permitting authority establishes a later date, after receiving site-relevant information from the discharger, which reflects a consideration of the following factors:

(1) Time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of this part.

(2) Changes being made or planned at the plant in response to:

(i) New source performance standards for greenhouse gases from new fossil fuel-fired electric generating units, under sections 111, 301, 302, and 307(d)(1)(C) of the Clean Air Act, as amended, 42 U.S.C. 7411, 7601, 7602, 7607(d)(1)(C);

(ii) Emission guidelines for greenhouse gases from existing fossil fuel-fired electric generating units, under sections 111, 301, 302, and 307(d) of the Clean Air Act, as amended, 42 U.S.C. 7411, 7601, 7602, 7607(d); or

(iii) Regulations that address the disposal of coal combustion residuals as solid waste, under sections 1006(b), 1008(a), 2002(a), 3001, 4004, and 4005(a) of the Solid Waste Disposal Act of 1970, as amended by the Resource Conservation and

(ee) The term coal combustion residual surface impoundment means a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of coal combustion residuals and liquids, and the unit treats, stores, or disposes of coal combustion residuals.

(ff) The term unmanaged combustion residual leachate means combustion residual leachate which either:

(1) Is determined by the permitting authority to be the functional equivalent of a direct discharge to waters of the United States (WOTUS) through groundwater; or

(2) Has leached from a waste management unit into the subsurface and mixed with groundwater prior to being captured and pumped to the surface for discharge directly to WOTUS.

**Credits**

[39 FR 36198, Oct. 8, 1974, as amended at 40 FR 7095, Feb. 19, 1975; 77 FR 29834, May 18, 2012; 80 FR 67893, Nov. 3, 2015; 82 FR 19005, April 25, 2017; 82 FR 43500, Sept. 18, 2017; 85 FR 64716, Oct. 13, 2020; 89 FR 40293, May 9, 2024]

SOURCE: 39 FR 36198, Oct. 8, 1974, as amended at 47 FR 52304, Nov. 19, 1982; 80 FR 67893, Nov. 3, 2015; 89 FR 40293, May 9, 2024, unless otherwise noted.

AUTHORITY: 33 U.S.C. 1251 et seq.; 1311; 1314(b), (c), (e), (g), and (i)(A) and (B); 1316; 1317; 1318 and 1361.

Notes of Decisions (12)

Current through November 5, 2024, 89 FR 87800. Some sections may be more current. See credits for details.

**End of Document**

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Code of Federal Regulations
Title 40. Protection of Environment
Chapter I. Environmental Protection Agency (Refs & Annos)
Subchapter N. Effluent Guidelines and Standards
Part 423. Steam Electric Power Generating Point Source Category (Refs & Annos)

40 C.F.R. § 423.13

# § 423.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Effective: July 8, 2024
Currentness

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this part must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(b)(1) For any plant with a total rated electric generating capacity of 25 or more megawatts, the quantity of pollutants discharged in once through cooling water from each discharge point shall not exceed the quantity determined by multiplying the flow of once through cooling water from each discharge point times the concentration listed in the following table:

| | BAT Effluent Limitations |
|---|---|
| **Pollutant or pollutant property** | **Maximum concentration (mg/l)** |
| Total residual chlorine..... | 0.20 |

(2) Total residual chlorine may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to the permitting authority that discharge for more than two hours is required for macroinvertebrate control. Simultaneous multi-unit chlorination is permitted.

(c)(1) For any plant with a total rated generating capacity of less than 25 megawatts, the quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentration listed in the following table:

| | BAT effluent limitations | |
|---|---|---|
| **Pollutant or pollutant property** | **Maximum concentration (mg/l)** | **Average concentration (mg/l)** |
| Free available chlorine..... | 0.5 | 0.2 |

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| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
|---|---|---|
| Arsenic, total (µg/L)..... | 11 | 8 |
| Mercury, total (ng/L)..... | 788 | 356 |

(l) Combustion residual leachate—

(1) 2024 BAT.

(i) Except for those discharges to which paragraph (l)(1)(i)(B) or (C) or (1)(2) of this section applies, there shall be no discharge of pollutants in combustion residual leachate.

(A) Dischargers must meet the effluent limitations for combustion residual leachate in this paragraph (l)(1)(i) by a date determined by the permitting authority that is as soon as possible beginning July 8, 2024, but no later than December 31, 2029. The effluent limitations in this paragraph (l)(1)(i) apply to the discharge of combustion residual leachate generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph (l)(1)(i).

(B) A facility which submits a request under § 423.19(n) may discharge permeate or distillate from a combustion residual leachate treatment system designed to achieve the limitations in this paragraph (l)(1)(i) for an additional period of up to one year from the date determined in paragraph (l)(1)(i)(A) of this section.

(C) After the retirement of all units at a facility, the quantity of pollutants in combustion residual leachate (CRL) shall not exceed the quantity determined by multiplying the flow of CRL permeate times the concentrations listed in the table 7 to paragraph (g)(3)(i) of this section or the flow of CRL distillate times the concentrations listed in the table following § 423.15(b)(13).

(ii) For combustion residual leachate generated before the date determined by the permitting authority, as specified in paragraph (l)(1)(i) of this section, the EPA is declining to establish BAT limitations and is reserving such limitations to be established by the permitting authority on a case-by-case basis using the permitting authority's best professional judgment.

(2) 2024 BAT subcategories.

(i) Discharges of combustion residual leachate for which the owner has submitted a certification pursuant to § 423.19(h).

(A) Where such unit has permanently ceased coal combustion by December 31, 2034, the quantity of pollutants in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration listed in table 11 to this paragraph (l)(2)(i)(A) by a date determined by the permitting

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authority that is as soon as possible beginning 120 days after the facility permanently ceases coal combustion, but no later than April 30, 2035.

**Table 11 to paragraph (l)(2)(i)(A)**

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L)..... | 11 | 8 |
| Mercury, total (ng/L)..... | 788 | 356 |

(B) Where such unit has failed to permanently cease coal combustion by December 31, 2034, there shall be no discharge of pollutants in combustion residual leachate after December 31, 2034.

(ii) For discharges of unmanaged combustion residual leachate, the quantity of pollutants in unmanaged combustion residual leachate shall not exceed the quantity determined by multiplying the flow of unmanaged combustion residual leachate times the concentration listed in the table 11 to paragraph (l)(2)(i)(A) of this section.

(A) Dischargers must meet the effluent limitations for unmanaged combustion residual leachate in this paragraph (l)(2)(ii) by a date determined by the permitting authority that is as soon as possible beginning July 8, 2024, but no later than December 31, 2029. The effluent limitations in this paragraph (l)(2)(ii) apply to the discharge of unmanaged combustion residual leachate generated on and after the date determined by the permitting authority for meeting the effluent limitations, as specified in this paragraph (l)(2)(ii).

(B) Discharges of unmanaged combustion residual leachate before the date determined in paragraph (l)(2)(ii)(A) of this section.

(iii) For combustion residual leachate discharged from any coal combustion residual surface impoundment which commences closure pursuant to 40 CFR 257.102(e) after July 8, 2024, the quantity of pollutants in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration listed in table 12 to this paragraph (l)(2)(iii).

**Table 12 to Paragraph (l)(2)(iii)**

| Pollutant or pollutant property | BAT effluent limitations | |
|---|---|---|
| | Maximum for any 1 day | Average of daily values for 30 consecutive days shall not exceed |
| Arsenic, total (µg/L)..... | 11 | 8 |

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