Memorandum

To: Steam Electric ELG Rulemaking Record – EPA-HQ-OW-2009-0819
From: U.S. EPA
Date: February 20, 2026
Re: Economic Analysis Memorandum for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category - Unmanaged Combustion Residual Leachate

1 Introduction

The EPA is proposing revisions to the effluent limitations and guidelines (ELG) applicable to unmanaged combustion residual leachate (CRL) discharges from steam electric plants. This memorandum presents the economic analysis of the options the EPA considered for this proposed rule.

The regulations at 40 CFR 423.11(r) define CRL as "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)."

This proposed rule applies more specifically to discharges of unmanaged CRL from an unlined impoundment or landfill. Unmanaged CRL is leachate that is not captured from a leachate collection system and instead percolates out of the landfill or impoundment unit and into the subsurface. The EPA defines two types of unmanaged CRL discharges in § 423.11(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."

The baseline for this action is the 2024 rule which set numerical limits based on chemical precipitation for the treatment of unmanaged CRL before discharge. The 2025 rule (91 FR 4016), which later extended compliance deadlines for certain wastestreams along with other amendments, did not affect the 2024 ELGs for unmanaged CRL.

The options considered for this proposed rule include:

- **Option 1**: keeping 2024 numerical limits based on chemical precipitation for pump and treat discharges only (type 2 above) and setting limits subject to best professional judgement (BPJ) for discharges that are the functional equivalent of a direct discharge (type 1 above).
- **Option 2**: setting numerical limits based on chemical precipitation for all unmanaged CRL (*i.e.*, maintaining the limits set in the 2024 rule baseline)
- **Option 3**: specifying zero-discharge for all unmanaged CRL.

The direction of economic impacts depends on changes between the option and the baseline. With respect to social costs to meet the limits, the EPA estimates that Option 1 would provide *cost savings* for plants that have discharges that are functionally equivalent to a direct discharge. For Option 2, the EPA estimates *no changes* relative to the baseline. For Option 3, the EPA estimates that plant owners would incur *additional costs* relative to costs to implement chemical precipitation under the baseline.

Table 1-1 summarizes the estimated social costs of the options relative to the 2024 rule baseline. See section 3.4 in this memo for details on the social cost analysis. The table also summarizes the benefits analyzed under each option. The EPA analyzed the benefits qualitatively by assessing the nature and direction of the environmental changes expected to result from each of the options. The sign of the total benefits for Options 1 and 3 is uncertain since some benefit categories are positive and others negative and magnitudes are unknown. See section 4 in this memo for details on the benefits analysis.

Table 1-1: Summary of Estimated Annualized Social Costs and Benefits of Options Relative to 2024 Rule Baseline

Option	Annualized Social Costs (Millions of 2024$) 3% Discount Lower Bound	Annualized Social Costs (Millions of 2024$) 3% Discount Upper Bound	Annualized Social Costs (Millions of 2024$) 7% Discount Lower Bound	Annualized Social Costs (Millions of 2024$) 7% Discount Upper Bound	Benefits
1	-$446.2	-$1,089.8	-$531.9	-$1,286.3	Forgone water-related benefits and positive non-water related benefits.
2	$0.0	$0.0	$0.0	$0.0	No benefits
3	$375.6	$715.7	$250.5	$475.2	Positive water-related benefits and forgone non-water related benefits.

Source: U.S. EPA Analysis, 2026.

2 Analysis Overview

The EPA generally followed the same methodology used in prior ELG rulemakings for this industry to analyze the costs, economic impacts, and benefits of this proposed rule. The discussion below follows a presentation very similar to that in the associated supporting documents (e.g., U.S. EPA, 2015a; 2015b, 2020a, 2020c, 2024a, 2024b). Because the methodology has been detailed in the prior supporting documents, this memo summarizes the approach and highlights key elements that differ from earlier analyses. For additional details on the methodology, see the 2024 Regulatory Impact Analysis (RIA) and 2024 Benefit Cost Analysis (BCA) documents (U.S. EPA, 2024a; 2024b).

Key updates to the methodology for this proposed rule analysis include:

- The EPA updated the lower and upper bound scenarios based on different sets of assumptions regarding which plants may incur costs for unmanaged CRL and the compliance approach. See section 3.1 below for additional information.
- The EPA revised its approach for estimating unmanaged CRL compliance costs to include pumping costs for plants that do not currently pump groundwater. These costs had been erroneously omitted from the costs developed in support of the 2024 ELGs. Pumping groundwater to the surface is necessary for the treatment of the unmanaged CRL discharge and therefore should have been included as a component of ELG compliance costs.
- The EPA reports costs in 2024 dollars.

- The EPA discounts and annualizes social costs at 3 percent and 7 percent discount rates for 28 years for all three options (2027-2054). All costs are discounted back to 2026.
- The EPA does not analyze the market-wide impacts of the proposed rule using the Integrated Planning Model (IPM), consistent with its exclusion of unmanaged CRL from IPM modeling in the 2024 rule; see Section 3.1 for more detail.

The EPA also made various updates to its models to incorporate more recent data. For example, the EPA updated electricity generation, sales, and electricity prices to incorporate the most current data from the Energy Information Administration (EIA) for 2024 (U.S. Energy Information Administration, 2025c). The EPA also updated data on the ultimate domestic parent entity, revenue, employment, North American Industry Classification System (NAICS) code, and ownership type for a small number of parent entities in the analysis that did not have information in the 2024 rule analysis. For these selective updates, the EPA used data from Dun & Bradstreet (2026), company webpages, and annual reports.

The EPA estimated compliance costs and pollutant loadings for all three options both in terms of total annualized costs of unmanaged CRL as well as in incremental terms, relative to the baseline. The relevant measures of the impacts of this proposed rule are those that consider the increment (increase or decrease) relative to the baseline.

The EPA analyzed the benefits of the proposed rule qualitatively.[1] See section 4 below for additional information.

3 Costs and Economic Impacts

3.1 Compliance Costs

The EPA developed costs for steam electric power plants to implement treatment technologies or process changes to control and treat the unmanaged CRL. There is uncertainty about which plants may incur costs to meet effluent limits for unmanaged CRL as it will depend on case-by-case findings by future permitting authorities. To account for this uncertainty, the EPA developed lower and upper bound scenarios that provide a range of cost estimates based on different sets of assumptions regarding which plants may incur costs and the compliance approach. The scenarios consider three main factors indicative of the potential for an unmanaged CRL discharge to be present, namely: the presence of landfills or surface impoundments that are not clean closed or composite lined, with a total estimated groundwater pumping rate greater than 0.5 gallons per minute (gpm), and undergoing corrective action for groundwater exceedances based on the site's most recent groundwater monitoring reported in the CCR database.

The EPA determined that between 63 and 111 power plants may be discharging unmanaged CRL based on whether the plants' waste management units are unlined, not clean-closed, or undergoing corrective action. For this analysis, the EPA considered all waste management units at operating power plants. The EPA does not expect that all these landfills and surface impoundments are discharging unmanaged CRL; permitting authorities would ultimately determine whether or not unmanaged CRL is discharged on a site-specific case-by-case basis.

[1] As discussed in the 2024 BCA (U.S. EPA, 2024a), because of uncertainty regarding which plants may be required to treat unmanaged CRL and the associated pollutant loading reductions, the EPA did not quantify the benefits of the unmanaged CRL limits in its analysis of the 2024 rule but, the EPA quantified and monetized benefits of limits for other wastestreams.

For the lower bound scenario, the EPA considered a population of 63 plants with CCR landfills or surface impoundments units without a composite liner that additionally report undergoing corrective action for groundwater exceedances based on the site's most recent groundwater monitoring reported in the CCR database. As shown by Table 3-1, the 63 plants in the lower bound scenario have a total of 91 waste management units, including 59 active units (41 of the plants have at least one active unit), 24 closed units, 7 inactive units, and 1 new unit.

Table 3-1: Population of Plants and Waste Management Units in EPA's Unmanaged CRL Bounded Engineering Analyses

Type of Waste Management Unit	Lower Bound (63 Plants)	Upper Bound (111 Plants)
Landfills with discharges of pumped unmanaged CRL	3	3
Surface Impoundments with discharges of pumped unmanaged CRL	13	13
Landfills with unmanaged CRL that is a potential functional equivalent of a direct discharge	19	98
Surface Impoundments with unmanaged CRL that is a potential functional equivalent of a direct discharge	56	181
Total Waste Management Units	91	295

Table note: Table 3-1 is Table 5-3 from the Technical Support Memo reproduced here for clarity.

For the upper bound scenario, the EPA considered a population of 111 plants with landfills or surface impoundments that are not clean closed or composite lined but did not limit the population to that where the waste management units have reported corrective action. The 111 plants in the upper bound scenarios have a total of 295 waste management units, including 199 active units (98 of the 111 plants have at least one active unit), 76 closed units, 17 inactive units, 2 new units, and one unit of unknown status.

The EPA identified seven plants, included in the populations for both scenarios, where pumping and treatment of groundwater was previously selected as the corrective remedy. The EPA sees this as indication that these plants currently generate a CRL discharge 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 WOTUS." (type 2).

Table 3-2 summarizes the technology basis assigned to the plants under each cost scenario and option. The EPA solicits comments on its assumptions regarding the number of plants affected in each scenario.

Table 3-2: Summary of Plant Universe and Technology Basis by Scenario, Option, and Discharger Type

Option	Discharge Type[a]	Lower Bound Scenario (63 Plants) Number of Plants	Lower Bound Scenario (63 Plants) Technology Basis[b]	Upper Bound Scenario (111 Plants) Number of Plants[c]	Upper Bound Scenario (111 Plants) Technology Basis[b]
1	Type 1	56	BPJ	104	BPJ
	Type 2	7	CP	7	CP
2	Type 1	56	CP	104	CP
	Type 2	7	CP	7	CP
3	Type 1	56	ZLD	104	ZLD
	Type 2	7	ZLD	7	ZLD

a. Type 1 = unmanaged CRL that the permitting authority determines is the functional equivalent of a direct discharge to WOTUS through groundwater; Type 2 = unmanaged 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 WOTUS

b. BPJ = best professional judgement; CP = chemical precipitation; ZLD = zero liquid discharge

c. Due to missing modeling inputs, the EPA omitted from the analyses documented in this memo one plant that may incur costs under the upper bound scenario for Options 2 and 3. The analysis therefore reflects a total of 110 plants for the upper bound scenario. The omitted costs represent approximately 0.1 percent of total industry compliance costs for these options.

Source: U.S. EPA Analysis, 2026.

For each of the upper and lower bound scenarios, the EPA estimated plant-level compliance costs consisting of capital costs and annual fixed operation and maintenance (O&M) costs for the chemical precipitation and zero liquid discharge technologies, and of recurring 6-year fixed O&M costs for chemical precipitation (*i.e.*, costs incurred every 6 years following technology installation). For BPJ, because of uncertainty regarding the limits that permit writers may set on a case-by-case basis considering site-specific factors, the EPA did not attribute compliance costs to the proposed rule relative to a "current conditions" baseline. Compared to the baseline for this rule, this results in an upper bound estimate of cost savings; to the extent that the BPJ process results in some facilities incurring compliance costs, the EPA's estimate of cost savings may be overestimated.

In contrast to the approach used for the 2024 rule analysis, the EPA generally included the costs to pump unmanaged CRL mixed with groundwater for treatment using chemical precipitation or zero liquid discharge technologies.[2] This addition, as well as changes to the definitions of the lower and upper bound scenarios, mean that even though the limits under Option 2 are the same as under the 2024 rule, the compliance costs used in this analysis are not the same as the costs used in the 2024 RIA (U.S. EPA, 2024b).

In analyzing the options, the EPA used the relevant compliance deadline for each option (*i.e.*, December 2029 for Option 2 and December 2034 for Options 1 and 3). Following the approach used in previous analyses, the EPA assumed that plants would implement technologies over the years leading to this deadline. For Option 2, the EPA started with the same technology implementation years that were modeled for the 2024 final rule, but modeled plants with implementation years previously in 2025 and 2026 as implementing the technologies to meet unmanaged CRL limits in 2027. Plants with modeled implementation years in 2027, 2028 and 2029 were left unchanged. For Options 1 and 3, the EPA delayed the original technology implementation years by five years (*e.g.*, plants previously modeled as implementing treatment technologies in 2026 were modeled as implementing the technologies in 2031).

EPA annualized and discounted all cost values to 2026, using a rate of 3.76 percent, the estimated weighted average cost of capital for the power sector.[3] Capital costs were annualized over 20 years, the useful life of the compliance technology. Costs recurring on a basis other than annual (*e.g.*, every 6 years) were annualized based on the recurrence period. For the assessment of compliance costs to steam electric power plants, EPA considered costs on both a pre-tax and after-tax basis. Pre-tax costs provide insight on the total expenditures as initially incurred by the plants. After-tax costs are a more meaningful measure of compliance impact on privately owned for-profit plants and incorporate approximate capital depreciation and other relevant tax treatments that reduce the net compliance burden on entities that own the plants. Since taxes are transfers, pre-tax costs reflect the real cost to society and are appropriate for benefit-cost analysis. Similarly, after-tax costs are reflective of private costs, which drive private decision-making,

[2] The EPA identified seven power plants as currently pumping and capturing unmanaged CRL (that is mixed with groundwater) before discharge. The EPA did not find evidence of additional power plants that are pumping and capturing unmanaged CRL at this time. For the seven facilities that currently pump and treat their unmanaged CRL, the EPA assumed no additional costs for pumping equipment would be incurred under the options. For the remaining plants, the EPA assumed that unmanaged CRL is not currently being pumped, captured or treated, and therefore these plants would incur compliance costs if they are determined to have unmanaged CRL discharges.

[3] See U.S. EPA (2023) for details. This rate differs from 3 percent and 7 percent discount rates used when presenting the social costs.

and are therefore appropriate for use in economic impact analysis. See Section 3 in the 2024 RIA for details on the methodology.

Table 3-3 presents lower and upper bound cost estimates for implementing the treatment technologies on which the limits under the three options are based. The table essentially presents the absolute costs for each option. Note that the costs shown for Option 2 are for meeting the limits in the 2024 rule, but with the revised lower and upper bound scenarios and compliance approaches. These costs are used as the baseline against which the options for this proposed rule are evaluated.

Table 3-3: Absolute Total Annualized Compliance Costs for Unmanaged CRL (in millions, 2024$, at 2026)

Scenario	Option	Pre-Tax Compliance Costs Capital	Pre-Tax Compliance Costs Total O&M	Pre-Tax Compliance Costs Total	After-Tax Compliance Costs Capital	After-Tax Compliance Costs Total O&M	After-Tax Compliance Costs Total
Lower Bound	1	$43.7	$77.8	$121.5	$35.3	$62.1	$97.4
	2	$260.5	$398.0	$658.4	$221.8	$337.4	$559.2
	3	$378.0	$698.3	$1,076.3	$322.6	$586.2	$908.8
Upper Bound[a]	1	$43.7	$77.8	$121.5	$35.3	$62.1	$97.4
	2	$618.1	$818.7	$1,436.8	$516.3	$685.4	$1,201.7
	3	$931.2	$1,308.7	$2,239.8	$778.2	$1,091.3	$1,869.5

a. Due to missing modeling inputs, the EPA omitted from the analyses documented in this memo one plant that may incur costs under the upper bound scenario for Options 2 and 3. The omitted costs represent approximately 0.1 percent of total industry compliance costs for these options.
Source: U.S. EPA Analysis, 2026.

Table 3-4 presents the incremental costs of each option relative to the 2024 rule baseline. These costs are calculated from the results presented in Table 3-3 by subtracting the reanalyzed baseline costs of the 2024 rule (represented by Option 2 above) from the costs of each option under the lower and upper bound scenarios. The negative incremental costs for Option 1 represent cost savings relative to the baseline, whereas positive costs for Option 3 represent additional costs relative to the baseline.

Table 3-4: Incremental Total Annualized Compliance Costs for Unmanaged CRL Relative to the 2024 Rule Baseline (in millions, 2024$, at 2026)

Scenario	Option	Pre-Tax Compliance Costs Capital	Pre-Tax Compliance Costs Total O&M	Pre-Tax Compliance Costs Total	After-Tax Compliance Costs Capital	After-Tax Compliance Costs Total O&M	After-Tax Compliance Costs Total
Lower Bound	1	-$216.8	-$320.2	-$537.0	-$186.5	-$275.3	-$461.8
	2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
	3	$117.5	$300.3	$417.9	$100.9	$248.8	$349.7
Upper Bound[a]	1	-$574.4	-$740.9	-$1,315.3	-$481.0	-$623.3	-$1,104.3
	2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
	3	$313.0	$490.0	$803.1	$261.9	$405.9	$667.8

a. Due to missing modeling inputs, the EPA omitted from the analyses documented in this memo one plant that may incur costs under the upper bound scenario for Options 2 and 3. The omitted costs represent approximately 0.1 percent of total industry compliance costs for these options.
Source: U.S. EPA Analysis, 2026.

Because of differences in operating characteristics of steam electric power plants across North American Electric Reliability Corporation (NERC) regions, as well as differences in the economic and electric power system regulatory circumstances of the NERC regions themselves, the options may affect costs, profitability, electricity prices, and other impact measures differently across regions. For example, under both the lower and upper bound scenarios, plants in the SERC Reliability Corporation (SERC) region are estimated to see over half of the total annualized cost savings summarized in Table 3-4 for Option 1, with plants in the Reliability First Corporation (RF) and Midwest Reliability Organization (MRO) regions accounting for almost all remaining total cost savings. Together, the three regions account for 94 percent

and 90 percent of the total cost savings for the proposed rule under the lower and upper bound scenarios, respectively. See section 3.3.1 in this memo for a summary of compliance costs of the options and cost scenarios by NERC regions.

IPM Rationale

- The EPA does not analyze the market-wide impacts of the proposed rule using the Integrated Planning Model (IPM), consistent with its exclusion of unmanaged CRL from IPM modeling in the 2024 rule. IPM models decisions on the least-cost method of meeting electricity demand and the EPA has typically used IPM to assess the effects of a change in fixed and variable production costs for certain electricity generating units (EGUs) on the EGUs and the power sector overall when those costs are directly tied to ongoing electricity production (*e.g.*, shift in generation across EGUs, total cost of generation, retail prices). However, IPM is not an appropriate tool for assessing the impacts of this proposed rule because unlike other steam electric plant wastestreams (*e.g.*, flue gas desulphurization wastewater, bottom ash transport water), unmanaged CRL discharges are not directly tied to current choices facilities and system operators make regarding dispatch and the electricity generated. The existence of unmanaged CRL derives from past coal-fired generation. Unmanaged CRL discharges are influenced by many factors, including: combustion residuals from past generation that are in the landfill/impoundment, rainfall/runoff, the geology between the landfill/impoundment and aquifer, the size and flow of the aquifer, *etc*. Moreover, an unmanaged CRL discharge subject to the ELGs would need to continue meeting the applicable limits for as long as the discharge occurs and irrespective of whether the EGUs that contributed combustion residuals to the landfills or impoundment were to cease operation, *i.e.*, even if the waste management unit ceases to receive coal combustion residuals. Because IPM treats retirement as eliminating a unit's future compliance costs, entering unmanaged CRL compliance costs into the model could produce questionable results regarding the incremental effects of this rule. For example, the model could incorrectly show early retirement as a cost-minimizing response, even though the facility would continue to incur unmanaged-CRL compliance costs after generation ceases. IPM is not designed to track such ongoing, site level environmental obligations that persist independently of electricity generation. For wastestreams whose costs scale with generation, EPA would typically use IPM to estimate power sector impacts. For this proposal, however, the singular focus on unmanaged CRL—whose compliance costs have a largely independent relationship with generation—means that an IPM run would not yield accurate or meaningful estimates of the rule's incremental effects. Consequently, EPA is not using IPM for this analysis.

  EPA acknowledges, however, that economic analyses of prior CWA regulations affecting the electricity generating sector have included IPM runs. EPA is confident in the foregoing arguments about not running IPM as regards Option 1, the preferred (deregulatory) option, for the proposed rule. EPA requests comment on whether the same logic would similarly apply to Option 3, a regulatory option. The agency may reconsider the decision to not run IPM for the final rule analysis, particularly if Option 1 were no longer the preferred option.

3.2 Cost and Economic Impact Screening Analyses

Following the approach used for prior rulemakings, the EPA used a screening-level assessment reflecting current operating characteristics of steam electric power plants and with assignment of estimated compliance costs to those plants. This analysis assumes no changes in operating characteristics — *e.g.*, quantity of generated electricity and revenue — as a result of the options. This screening-level assessment, which is documented in this section, includes two specific analyses: (1) a cost-to-revenue screening analysis to assess the impact of compliance outlays on individual steam electric power plants;

and (2) a cost-to-revenue screening analysis to assess the impact of compliance outlays on domestic parent-entities owning steam electric power plants. Having both levels of analysis provides insight on how impacts differ at these two levels.

3.2.1 Cost-to-Revenue Analysis: Plant-Level Screening Analysis

The cost-to-revenue measure compares the cost of implementing and operating compliance technologies with the plant's operating revenue and provides a screening-level assessment of the impact of the options. The EPA used 2026 as the basis for comparing after-tax compliance costs described above to revenue at the plant level. For this comparison, the EPA developed plant-level revenue values for all steam electric power plants using data from the EIA on electricity generation by prime mover, and utility/operator-level electricity prices and disposition. To provide cost and revenue comparisons on a consistent analysis-year (2026) and dollar-year (2024) basis, EPA adjusted the EIA electricity price data, which are reported in nominal dollars of each year. In assessing the cost impact of the options on steam electric power plants in this screening-level analysis, the EPA assumed that the plants would not be able to pass any of the changes in their production costs to consumers (zero cost pass-through). This assumption is used for analytic convenience and provides a worst-case scenario of the impacts of compliance costs on steam electric power plants. See Section 4.2 of the 2024 RIA for details of the approach.

Cost-to-revenue ratios are used to describe impacts to entities because they provide screening-level indicators of potential economic impacts. The EPA assesses plants incurring costs below one percent of revenue as unlikely to face material economic impacts, plants with costs of at least one percent but less than three percent of revenue as having a higher chance of facing material economic impacts, and plants incurring costs of at least three percent of revenue as having a still higher probability of material economic impacts.

The EPA conducted these analyses based on the total costs for meeting the limits in the reanalyzed baseline costs of the 2024 rule and under each of the options. The EPA then compared these impacts to understand the incremental effects of the options in this proposal. Table 3-5 presents the cost-to-revenue analysis results for the reanalyzed baseline costs of the 2024 rule. Table 3-6 then presents the incremental results for the options relative to that baseline. Within each row, the table shows the net counts as plants move lower or higher on the impact scale. The changes can be in either direction depending on the option: from some impacts to no impacts (Option 1), or from impacts at 0-1 percent, to greater impacts at the 1-3 percent or greater than 3 percent levels (Option 3). As shown in the table, the proposed rule (Option 1) results in 29 fewer plants with costs of one percent or greater under the lower bound scenario, and 74 fewer plants under the upper bound scenario. By contrast, Option 3 results in 7 and 15 more plants having costs of one percent or greater under the lower and upper bound scenarios, respectively.

Table 3-5: Plant-Level Cost-to-Revenue Analysis Results for the 2024 Rule Baseline

Scenario	Option	Total Number of Plants[a]	Number of Plants with a Ratio of 0%[a,b]	Number of Plants with a Ratio of ≠0 and <1%	Number of Plants with a Ratio of ≥1 and <3%	Number of Plants with a Ratio of ≥3%
Lower Bound	Baseline	808	739	30	13	20
Upper Bound	Baseline	808	692	32	37	41

a. Plant counts are weighted estimates.
b. These plants already do not generate discharges controlled by a given option and therefore are not estimated to incur compliance technology costs.
Source: U.S. EPA Analysis, 2026.

Table 3-6: Plant-Level Cost-to-Revenue Analysis Results by Option

Scenario	Option	Total Number of Plants[a]	Change in the Number of Plants with a Ratio of 0%[a,b]	Change in the Number of Plants with a Ratio of ≠0 and <1%	Change in the Number of Plants with a Ratio of ≥1 and <3%	Change in the Number of Plants with a Ratio of ≥3%
Lower Bound	1	808	56	-27	-12	-17
	2	808	0	0	0	0
	3	808	0	-7	1	6
Upper Bound	1	808	103	-29	-36	-38
	2	808	0	0	0	0
	3	808	0	-15	3	12

a. Plant counts are weighted estimates.
b. These plants already do not generate discharges controlled by a given option and therefore are not estimated to incur compliance technology costs.
Source: U.S. EPA Analysis, 2026.

3.2.2 Cost-to-Revenue Analysis: Parent Entity-Level Screening Analysis

The cost-to-revenue screening analysis at the entity level adds insight on the impact of compliance requirements on those entities that own multiple plants. The EPA conducted this screening analysis at the highest level of domestic ownership, referred to as the "domestic parent entity." For this analysis, the Agency considered only entities with the largest share of ownership (*e.g.*, majority owner) in at least one surveyed steam electric power plant. The entity-level analysis maintains the worst-case analytical assumption of no pass-through of compliance costs to electricity consumers used for the plant-level cost-to-revenue analysis. To assess the entity-level economic/financial impact of compliance requirements, the EPA summed plant-level annualized after-tax compliance costs calculated in section 3.1 to the level of the steam electric power plant owning entity and compared these costs to parent entity revenue.

Similar to the plant-level analysis, the EPA used cost-to-revenue ratios of one and three percent as markers of potential impact for this analysis. Also similar to the assumptions made for the plant-level analysis, for this entity-level analysis the EPA assumed that entities incurring costs below one percent of revenue are unlikely to face significant economic impacts, while entities with costs of at least one percent but less than three percent of revenue have a higher chance of facing significant economic impacts, and entities incurring costs of at least three percent of revenue have a still higher probability of significant economic impacts. Following the approach used previous rulemakings, the EPA analyzed two cases that provide approximate upper and lower bound estimates on: (1) the number of entities incurring compliance costs and (2) the costs incurred by any entity owning one or more steam electric power plant. See section 4.3 of the 2024 RIA for details of the approach (U.S. EPA, 2024b).

Following the approach used for previous steam electric ELG rulemakings, the EPA explicitly modeled a subset of the full universe of plants that meet the steam electric industry definition, extrapolating results to the full industry using survey weights (U.S. EPA, 2015b, 2020c, 2024b). The modeled subset was based on the survey the EPA conducted in 2009 and includes all coal-fired steam electric plants plus a sample of other steam electric plants. To extrapolate the ownership information available for the explicitly modeled subset of plants to the full industry, the EPA developed two cases that provide a range of estimates for the number of entities incurring compliance costs and the costs incurred by any entity owning a steam electric power plant: (Case 1) Assuming that the surveyed owners represent all owners, which effectively assumes that any non-surveyed plants are owned by the same surveyed entities and maximizes the number of plants owned by any given entity; and (Case 2) Assuming that the non-surveyed

owners are different from those surveyed but have similar characteristics, which results in a greater number of owners but minimizes the number of plants owned by each.

The EPA estimated that the number of entities owning existing EGUs at steam electric plants ranges from 209 to 373, depending on the assumed ownership structure of plants not incurring ELG costs and not explicitly analyzed (*i.e.*, Case 1 and Case 2). Of these entities, 35 are associated with the 63 plants estimated to incur unmanaged CRL costs under the lower bound scenario, and 59 are associated with the 111 plants estimated to incur costs under the upper bound scenario.

Table 3-7 presents the results from the entity-level impact analysis under Case 1 and Case 2 estimates of the number of entities incurring costs under the reanalyzed baseline of the 2024 rule for each bounding scenario. The table shows the number of entities that incur costs in four ranges: no cost, and non-zero costs less than one percent of an entity's revenue, at least one percent but less than three percent of revenue, and at least three percent of revenue.

Table 3-8 presents the results for the options relative to the baseline by summarizing the changes in the number of entities incurring costs in the four ranges. Within each row, the table shows the net counts as plants move lower or higher on the impact scale. The changes can be in either direction depending on the option: from some impacts to no impacts (Option 1), or from impacts at 0-1 percent, to greater impacts at the 1-3 percent or greater than 3 percent levels (Option 3). Negative numbers indicate that fewer entities incur costs in the indicated impact range when compared to the baseline but these are offset by positive numbers in a different range where the entities moved.

Overall, this screening-level analysis shows that fewer entities are likely to experience significant economic impacts, as indicated by the cost-to-revenue ratios, under Option 1 compared to the baseline. For example, 7 and 20 fewer entities incur costs exceeding three percent of revenue under Option 1 under the lower or upper bound scenarios, respectively. Conversely, Option 3 increases entity compliance burden, with 2 and 6 more entities incurring costs exceeding three percent of revenue for the two bounding scenarios.

Table 3-7: Entity-Level Cost-to-Revenue Analysis Results for the Baseline for Case 1 and Case 2 of Firms Owning Plants that Face Requirements under the Regulatory Analysis

Scenario	Option	Case 1 Total Number of Entities	Case 1 Number of Entities with a Ratio of 0%[a]	Case 1 Number of Entities with a Ratio of ≠0 and <1%	Case 1 Number of Entities with a Ratio of ≥1 and <3%	Case 1 Number of Entities with a Ratio of ≥3%	Case 2 Total Number of Entities	Case 2 Number of Entities with a Ratio of 0%[a]	Case 2 Number of Entities with a Ratio of ≠0 and <1%	Case 2 Number of Entities with a Ratio of ≥1 and <3%	Case 2 Number of Entities with a Ratio of ≥3%
Lower Bound	Baseline	209	174	26	2	7	373	338	26	2	7
Upper Bound	Baseline	209	150	37	11	11	373	314	37	11	11

a. These entities own only plants that do not generate discharges controlled by a given option and are therefore not estimated to incur compliance technology costs.
Source: U.S. EPA Analysis, 2026.

Table 3-8: Entity-Level Cost-to-Revenue Analysis Results by Option for Case 1 and Case 2 of Firms Owning Plants that Face Requirements under the Regulatory Analysis

Scenario	Option	Case 1 Total Number of Entities	Case 1 Change in the Number of Entities with a Ratio of 0%[a]	Case 1 Change in the Number of Entities with a Ratio of ≠0 and <1%	Case 1 Change in the Number of Entities with a Ratio of ≥1 and <3%	Case 1 Change in the Number of Entities with a Ratio of ≥3%	Case 2 Total Number of Entities	Case 2 Change in the Number of Entities with a Ratio of 0%[a]	Case 2 Change in the Number of Entities with a Ratio of ≠0 and <1%	Case 2 Change in the Number of Entities with a Ratio of ≥1 and <3%	Case 2 Change in the Number of Entities with a Ratio of ≥3%
Lower Bound	1	209	29	-22	-2	-5	373	29	-22	-2	-5
	2	209	0	0	0	0	373	0	0	0	0
	3	209	0	-2	0	2	373	0	-2	0	2
Upper Bound	1	209	53	-33	-11	-9	373	53	-33	-11	-9
	2	209	0	0	0	0	373	0	0	0	0
	3	209	0	-6	1	5	373	0	-6	1	5

a. These entities own only plants that do not generate discharges controlled by a given option and are therefore not estimated to incur compliance technology costs.
Source: U.S. EPA Analysis, 2026.

3.3 Assessment of Potential Electricity Price Effects

The EPA assessed the potential impacts of the options on electricity prices. Following the methodology used for earlier rulemakings, the EPA conducted this analysis in two parts: (1) An assessment of the potential annual change in electricity costs per MWh of total electricity sales; and (2) An assessment of the potential annual change in household electricity costs.

As is the case with the plant-level and parent entity-level cost-to-revenue screening analyses discussed above in section 3.2, this analysis of electricity price effects uses a historical snapshot of electricity generation against which to assess the relative impacts of the options. However, unlike the plant- and entity-level screening analyses which assume that steam electric power plants and their parent entities would absorb 100 percent of the compliance burden (zero cost pass-through), this electricity price impact assessment assumes the opposite: 100 percent pass-through of compliance costs to retail electricity prices. As mentioned above in the discussion of power sector modeling, the changes in compliance costs from this action are not necessarily related to future operating decisions. Therefore, this action may not affect electricity rates if the costs do not affect generator bids in competitive markets nor regulator-approved cost-recovery in cost-of-service regions. However, households are the owners of firms and capital as well as the end-use consumers of goods and services. Therefore, households will realize the full cost-savings of this action regardless of the pass-through mechanism. That said, the pass-through mechanism is very important for understanding the distribution of impacts across households. It is also important to note that the assumptions of full cost pass-through to retail electricity prices is inconsistent with the no cost pass-through assumptions in section 3.2 where costs are not recovered in retail rates. In both instances, the EPA uses an analytic assumption that provides an upper bound on the absolute magnitude of the impacts being evaluated. See section 7 in the 2024 RIA for details of the methodology.

As described in section 3.1 of this memo, differences in operating characteristics of steam electric power plants across NERC regions, as well as differences in the economic and electric power system regulatory circumstances of the NERC regions themselves, mean that the options may affect electricity prices differently across regions. For this reason, the EPA conducted the assessment of electricity price effects at the level of the NERC regions. NERC regions are shown in Table 3-9.

Table 3-9: NERC regions

Bulk Power Network	NERC Region	NERC Entity
Eastern Interconnected System	MRO	Midwest Reliability Organization
	NPCC	Northeast Power Coordinating Council (U.S.)
	RF	Reliability First Corporation
	SERC	SERC Reliability Corporation
Western Interconnected System	WECC	Western Electricity Coordinating Council (U.S.)
Texas Interconnected System	TRE	Texas Reliability Entity
	ASCC	Alaska Systems Coordinating Council
	HICC	Hawaii Coordinating Council

Source: NERC, undated

3.3.1 Assessment of Impact of Compliance Costs on Electricity Prices

Table 3-10 reports the compliance costs per unit of sales for the reanalyzed baseline of the 2024 rule under the bounding scenarios. As shown in the results, costs per kWh of sales vary across the regions, with the average costs at the national level ranging between 0.017 and 0.037 ¢/kWh for the lower and upper bound scenarios, but with maximum unit costs as high as 0.252 ¢/kWh.

Table 3-10: Compliance Cost per KWh Sales by NERC Region for the Baseline in 2026 (2024$)

Scenario	Option	NERC[a]	Total Electricity Sales (at 2026; MWh)	Pre-Tax Compliance Costs (at 2026; 2024$)	Costs per Unit of Sales (2024¢/kWh Sales)
Lower Bound	Baseline	ASCC	5,414,197	$2,480,306	0.046¢
		MRO	471,652,313	$67,819,344	0.014¢
		NPCC	251,957,069	$0	0.000¢
		RF	733,421,028	$127,626,799	0.017¢
		SERC	1,345,241,272	$317,849,336	0.024¢
		TRE	403,399,017	$8,255,160	0.002¢
		WECC	713,053,902	$134,417,488	0.019¢
		US	**3,932,830,176**	**$658,448,433**	**0.017¢**
Upper Bound	Baseline	ASCC	5,414,197	$13,667,505	0.252¢
		MRO	471,652,313	$260,822,493	0.055¢
		NPCC	251,957,069	$1,366,161	<0.001¢
		RF	733,421,028	$241,850,743	0.033¢
		SERC	1,345,241,272	$687,845,330	0.051¢
		TRE	403,399,017	$45,647,883	0.011¢
		WECC	713,053,902	$185,589,504	0.026¢
		US	**3,932,830,176**	**$1,436,789,620**	**0.037¢**

Unmanaged CRL compliance costs are zero in the HICC region and this region is therefore omitted from the presentation. Because of this, the sum of electricity sales for all regions do not sum to the total for the United States.
Source: U.S. EPA Analysis, 2026; U.S. EIA, 2025a; 2025b.

Table 3-11 presents the results for the options relative to the baseline. Option 1 significantly reduces the impacts at the national level (by 0.014 ¢/kWh and 0.033 ¢/kWh under the lower and upper bound scenarios, representing 82 to 92 percent reductions of the baseline unit cost) and in most regions. Conversely, Option 3 increases the unit costs (by 0.011 ¢/kWh and 0.020 ¢/kWh under the lower and upper bound scenarios, which represent increases of 63 and 36 percent over the corresponding baseline unit costs).

Table 3-11: Incremental Compliance Cost per KWh Sales by NERC Region and Option in 2026, Relative to the Baseline (2024$)

Scenario	Option	NERC[a]	Total Electricity Sales (at 2026; MWh)	Incremental Pre-Tax Compliance Costs (at 2026; 2024$)	Incremental Costs per Unit of Sales (2024¢/kWh Sales)
Lower Bound	1	ASCC	5,414,197	-$2,480,306	-0.046¢
		MRO	471,652,313	-$67,819,344	-0.014¢
		NPCC	251,957,069	$0	0.000¢
		RF	733,421,028	-$127,626,799	-0.017¢
		SERC	1,345,241,272	-$308,999,959	-0.023¢
		TRE	403,399,017	-$2,646,240	<0.001¢
		WECC	713,053,902	-$27,406,001	-0.004¢
		US	**3,932,830,176**	**-$536,978,648**	**-0.014¢**
Lower Bound	2	ASCC	5,414,197	$0	0.000¢
		MRO	471,652,313	$0	0.000¢
		NPCC	251,957,069	$0	0.000¢
		RF	733,421,028	$0	0.000¢
		SERC	1,345,241,272	$0	0.000¢
		TRE	403,399,017	$0	0.000¢
		WECC	713,053,902	$0	0.000¢
		US	**3,932,830,176**	**$0**	**0.000¢**
Lower Bound	3	ASCC	5,414,197	$1,416,206	0.026¢
		MRO	471,652,313	$49,719,145	0.011¢
		NPCC	251,957,069	$0	0.000¢
		RF	733,421,028	$77,603,120	0.011¢
		SERC	1,345,241,272	$180,941,889	0.013¢
		TRE	403,399,017	$4,473,014	0.001¢
		WECC	713,053,902	$103,730,935	0.015¢
		US	**3,932,830,176**	**$417,884,310**	**0.011¢**
Upper Bound	1	ASCC	5,414,197	-$13,667,505	-0.252¢
		MRO	471,652,313	-$260,822,493	-0.055¢
		NPCC	251,957,069	-$1,366,161	<0.001¢
		RF	733,421,028	-$241,850,743	-0.033¢
		SERC	1,345,241,272	-$678,995,953	-0.050¢
		TRE	403,399,017	-$40,038,963	-0.010¢
		WECC	713,053,902	-$78,578,016	-0.011¢
		US	**3,932,830,176**	**-$1,315,319,835**	**-0.033¢**
Upper Bound	2	ASCC	5,414,197	$0	0.000¢
		MRO	471,652,313	$0	0.000¢
		NPCC	251,957,069	$0	0.000¢
		RF	733,421,028	$0	0.000¢
		SERC	1,345,241,272	$0	0.000¢
		TRE	403,399,017	$0	0.000¢
		WECC	713,053,902	$0	0.000¢
		US	**3,932,830,176**	**$0**	0.000¢
Upper Bound	3	ASCC	5,414,197	$9,304,377	0.172¢
		MRO	471,652,313	$140,192,248	0.030¢
		NPCC	251,957,069	$138,457	<0.001¢
		RF	733,421,028	$132,952,433	0.018¢
		SERC	1,345,241,272	$373,470,308	0.028¢
		TRE	403,399,017	$22,510,907	0.006¢
		WECC	713,053,902	$124,488,122	0.017¢
		US	**3,932,830,176**	**$803,056,852**	**0.020¢**

Unmanaged CRL compliance costs are zero in the HICC region and this region is therefore omitted from the presentation. Because of this, the sum of electricity sales for all regions do not sum to the total for the United States.

Source: U.S. EPA Analysis, 2026; U.S. EIA, 2025a; 2025b.

To determine the relative significance of compliance costs on electricity prices across consumer groups, EPA also compared the per kWh compliance cost presented in Table 3-10 to retail electricity prices projected by EIA (Table 3-12; EIA, 2025b) by consuming group and for the average of the groups. The analysis assumes that any price change would apply equally to all consumer groups. Table 3-13 presents the results of the analysis of the baseline. Overall across all consumer groups, the costs per unit of sales are small relative to the price of electricity, but with some marked differences across the options (*e.g.*, Option 3) and regions (*e.g.*, ASCC region).

Table 3-14 presents the impacts of the incremental compliance costs on prices for each option relative to the baseline. The results show reductions in the ELG compliance burden for Option 1 ranging from -0.09% to -0.37% depending on the bounding scenario and sector. By contrast, Option 3 increases the ELG compliance burden by 0.07% to 0.23%.

Table 3-12: Projected 2026 Price (2024 Cents per kWh of Sales) by NERC Region

NERC	Residential EIA Price Basis (2024¢ /kWh)	Commercial EIA Price Basis (2024¢ /kWh)	Industrial EIA Price Basis (2024¢ /kWh)	Transportation EIA Price Basis (2024¢ /kWh)	All Sectors Average EIA Price Basis (2024¢ /kWh)
ASCC	24.26¢	20.27¢	18.77¢	NA	24.26¢
MRO	47.22¢	38.61¢	29.75¢	40.92¢	38.40¢
NPCC	74.44¢	59.80¢	55.81¢	58.19¢	64.38¢
RF	61.96¢	51.11¢	38.04¢	49.77¢	51.40¢
SERC	98.00¢	79.13¢	53.57¢	78.31¢	80.01¢
TRE	12.27¢	9.50¢	7.95¢	10.08¢	10.02¢
WECC	114.26¢	95.49¢	75.98¢	97.16¢	97.90¢
US	**15.54¢**	**13.15¢**	**9.04¢**	**14.53¢**	**13.00¢**

a. The rate impact analysis assumes full pass-through of all compliance costs to retail electricity prices.
b. Unmanaged CRL compliance costs are zero in the HICC region and this region is therefore omitted from the presentation.
Sources: U.S. EPA Analysis, 2026; U.S. EIA, 2025a; 2025b.

Table 3-13: Potential Price Increase Due to Compliance Costs by NERC Region for the Baseline (2024$)

Scenario	Option	NERC[b]	Compliance Costs (2024¢ /kWh)	Residential % Change[a]	Commercial % Change[a]	Industrial % Change[a]	Transportation % Change[a]	All Sectors Average % Change[a]
Lower Bound	Baseline	ASCC	0.046¢	0.19%	0.23%	0.24%	NA	0.19%
		MRO	0.014¢	0.03%	0.04%	0.05%	0.04%	0.04%
		NPCC	0.000¢	0%	0%	0%	0%	0%
		RF	0.017¢	0.03%	0.03%	0.05%	0.03%	0.03%
		SERC	0.024¢	0.02%	0.03%	0.04%	0.03%	0.03%
		TRE	0.002¢	0.02%	0.02%	0.03%	0.02%	0.02%
		WECC	0.019¢	0.02%	0.02%	0.02%	0.02%	0.02%
		US	**0.017¢**	**0.11%**	**0.13%**	**0.19%**	**0.12%**	**0.13%**
Upper Bound	Baseline	ASCC	0.252¢	1.04%	1.25%	1.34%	NA	1.04%
		MRO	0.055¢	0.12%	0.14%	0.19%	0.14%	0.14%
		NPCC	<0.001¢	0.00%	0.00%	0.00%	0.00%	0.00%
		RF	0.033¢	0.05%	0.06%	0.09%	0.07%	0.06%
		SERC	0.051¢	0.05%	0.06%	0.10%	0.07%	0.06%
		TRE	0.011¢	0.09%	0.12%	0.14%	0.11%	0.11%
		WECC	0.026¢	0.02%	0.03%	0.03%	0.03%	0.03%
		US	**0.037¢**	**0.24%**	**0.28%**	**0.40%**	**0.25%**	**0.28%**

a. The rate impact analysis assumes full pass-through of all compliance costs to retail electricity prices.
b. Unmanaged CRL compliance costs are zero in the HICC region and this region is therefore omitted from the presentation.
Sources: U.S. EPA Analysis, 2026; U.S. EIA, 2025a; 2025b.

Table 3-14: Change in Price Increase Due to Incremental Compliance Costs by NERC Region and Option (2024$)

Scenario	Option	NERC[b]	Incremental Compliance Costs (2024¢/kWh)	Residential % Change[a]	Commercial % Change[a]	Industrial % Change[a]	Transportation % Change[a]	All Sectors Average % Change[a]
Lower Bound	1	ASCC	-0.046¢	-0.19%	-0.23%	-0.24%	zero	-0.19%
		MRO	-0.014¢	-0.03%	-0.04%	-0.05%	-0.04%	-0.04%
		NPCC	0.000¢	0%	0%	0%	0%	0%
		RF	-0.017¢	-0.03%	-0.03%	-0.05%	-0.03%	-0.03%
		SERC	-0.023¢	-0.02%	-0.03%	-0.04%	-0.03%	-0.03%
		TRE	<0.001¢	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%
		WECC	-0.004¢	0.00%	0.00%	-0.01%	0.00%	0.00%
		US	**-0.014¢**	**-0.09%**	**-0.10%**	**-0.15%**	**-0.09%**	**-0.11%**
Lower Bound	2	ASCC	0.000¢	0%	0%	0%	0%	0%
		MRO	0.000¢	0%	0%	0%	0%	0%
		NPCC	0.000¢	0%	0%	0%	0%	0%
		RF	0.000¢	0%	0%	0%	0%	0%
		SERC	0.000¢	0%	0%	0%	0%	0%
		TRE	0.000¢	0%	0%	0%	0%	0%
		WECC	0.000¢	0%	0%	0%	0%	0%
		US	**0.000¢**	**0%**	**0%**	**0%**	**0%**	**0%**
Lower Bound	3	ASCC	0.026¢	0.11%	0.13%	0.14%	zero	0.11%
		MRO	0.011¢	0.02%	0.03%	0.04%	0.03%	0.03%
		NPCC	0.000¢	0%	0%	0%	0%	0%
		RF	0.011¢	0.02%	0.02%	0.03%	0.02%	0.02%
		SERC	0.013¢	0.01%	0.02%	0.03%	0.02%	0.02%
		TRE	0.001¢	0.01%	0.01%	0.01%	0.01%	0.01%
		WECC	0.015¢	0.01%	0.02%	0.02%	0.01%	0.01%
		US	**0.011¢**	**0.07%**	**0.08%**	**0.12%**	**0.07%**	**0.08%**
Upper Bound	1	ASCC	-0.252¢	-1.04%	-1.25%	-1.34%	zero	-1.04%
		MRO	-0.055¢	-0.12%	-0.14%	-0.19%	-0.14%	-0.14%
		NPCC	<0.001¢	0.00%	0.00%	0.00%	0.00%	0.00%
		RF	-0.033¢	-0.05%	-0.06%	-0.09%	-0.07%	-0.06%
		SERC	-0.050¢	-0.05%	-0.06%	-0.09%	-0.06%	-0.06%
		TRE	-0.010¢	-0.08%	-0.10%	-0.12%	-0.10%	-0.10%
		WECC	-0.011¢	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%
		US	**-0.033¢**	**-0.22%**	**-0.25%**	**-0.37%**	**-0.23%**	**-0.26%**
Upper Bound	2	ASCC	0.000¢	0%	0%	0%	0%	0%
		MRO	0.000¢	0%	0%	0%	0%	0%
		NPCC	0.000¢	0%	0%	0%	0%	0%
		RF	0.000¢	0%	0%	0%	0%	0%
		SERC	0.000¢	0%	0%	0%	0%	0%
		TRE	0.000¢	0%	0%	0%	0%	0%
		WECC	0.000¢	0%	0%	0%	0%	0%
		US	**0.000¢**	**0%**	**0%**	**0%**	**0%**	**0%**
Upper Bound	3	ASCC	0.172¢	0.71%	0.85%	0.92%	zero	0.71%
		MRO	0.030¢	0.06%	0.08%	0.10%	0.07%	0.08%
		NPCC	<0.001¢	0.00%	0.00%	0.00%	0.00%	0.00%
		RF	0.018¢	0.03%	0.04%	0.05%	0.04%	0.04%
		SERC	0.028¢	0.03%	0.04%	0.05%	0.04%	0.03%
		TRE	0.006¢	0.05%	0.06%	0.07%	0.06%	0.06%
		WECC	0.017¢	0.02%	0.02%	0.02%	0.02%	0.02%
		US	**0.020¢**	**0.13%**	**0.16%**	**0.23%**	**0.14%**	**0.16%**

a. The rate impact analysis assumes full pass-through of all compliance costs to retail electricity prices.
b. Unmanaged CRL compliance costs are zero in the HICC region and this region is therefore omitted from the presentation.
Sources: U.S. EPA Analysis, 2026; U.S. EIA, 2025a; 2025b.

3.3.2 Assessment of Impact of Compliance Costs on Household Electricity Costs

For this analysis, the EPA again assumed that compliance costs would be fully passed through to consumers as changes in electricity prices and allocated these costs to residential households in proportion to the baseline electricity consumption. As discussed above, this impact is less than the full cost-savings that will be realized by households because households are the owners of firms and capital as well as the end-users of goods and services. The EPA analyzed the potential impact on annual electricity costs for the 'average' household, using the estimated household electricity consumption quantity by NERC region. Table 3-15 summarizes the basis the EPA used to assess the impacts of compliance costs on household electricity costs. The impacts of the reanalyzed baseline of the 2024 rule are shown in Table 3-16, which reports the upper and lower bound scenario results of this analysis by NERC region and for the United States overall.

Table 3-17 presents the incremental impacts for the three options relative to the baseline. The proposed rule (Option 1) results in estimated annual cost savings to the average residential household of $1.38 to $3.37 when compared to the baseline, with the savings varying across the regions. In the ASCC and SERC regions, the savings are two to five times larger than the savings for the average US household. By comparison, Option 3 is estimated to increase the average household annual electricity costs by $1.07 to $2.06 per year relative to the baseline, but again with significant variability across the regions. For the ASCC region, the increase under the high bound scenario is almost six times larger than that for the average US household.

Table 3-15: Electricity Sales and Number of Households in 2026 by NERC Region and Option

NERC[a]	Total Electricity Sales (MWh)	Residential Electricity Sales (MWh)	Number of Households	Residential Sales per Residential Household (MWh/year)
ASCC	5,414,197	1,891,664	273,042	6.93
MRO	471,652,313	118,476,979	11,089,040	10.68
NPCC	251,957,069	106,101,769	15,060,682	7.04
RF	733,421,028	294,467,144	31,784,994	9.26
SERC	1,345,241,272	515,013,600	39,707,026	12.97
TRE	403,399,017	86,166,581	7,134,686	12.08
WECC	713,053,902	251,949,758	30,973,719	8.13
US	**3,932,830,176**	**1,376,556,637**	**136,469,701**	**10.09**

a. Unmanaged CRL compliance costs are zero in the HICC region and this region is therefore omitted from the presentation. For this reason, electricity sales shown for the United States is greater than the total for NERC regions included in the table.
Sources: U.S. EPA Analysis, 2026; U.S. EIA, 2025a, 2025b; 2025c.

Table 3-16: Average Annual Unmanaged CRL Compliance Cost per Household in 2026 by NERC Region for the Baseline

Scenario	Option	NERC[b]	Total Pre-Tax Compliance Costs (at 2026; 2024$/year)	Total Compliance Costs per Unit of Sales (2024$/MWh)	Total Compliance Costs per Residential Household (2024$/year)
Lower Bound	Baseline	ASCC	$2,480,306	$0.46	$3.17
		MRO	$67,819,344	$0.14	$1.54
		NPCC	$0	$0.00	$0.00
		RF	$127,626,799	$0.17	$1.61
		SERC	$317,849,336	$0.24	$3.06
		TRE	$8,255,160	$0.02	$0.25
		WECC	$134,417,488	$0.19	$1.53
		US[b]	**$658,448,433**	**$0.17**	**$1.69**

Scenario	Option	NERC[b]	Total Pre-Tax Compliance Costs (at 2026; 2024$/year)	Total Compliance Costs per Unit of Sales (2024$/MWh)	Total Compliance Costs per Residential Household (2024$/year)
Upper Bound	Baseline	ASCC	$13,667,505	$2.52	$17.49
		MRO	$260,822,493	$0.55	$5.91
		NPCC	$1,366,161	<$0.01	$0.04
		RF	$241,850,743	$0.33	$3.05
		SERC	$687,845,330	$0.51	$6.63
		TRE	$45,647,883	$0.11	$1.37
		WECC	$185,589,504	$0.26	$2.12
		US[b]	**$1,436,789,620**	**$0.37**	**$3.69**

a. This analysis assumes full pass-through of all compliance costs to retail electricity prices.
b. Unmanaged CRL compliance costs are zero in the HICC region and this region is therefore omitted from the presentation.
Sources: U.S. EPA Analysis, 2026; U.S. EIA, 2025a, 2025b; 2025c.

Table 3-17: Average Annual Incremental Unmanaged CRL Compliance Cost per Household in 2026 by NERC Region and Option, Relative to the Baseline

Scenario	Option	NERC[b]	Incremental Pre-Tax Compliance Costs (at 2026; 2024$/year)	Incremental Compliance Costs per Unit of Sales (2024$/MWh)	Incremental Compliance Costs per Residential Household (2024$/year)
Lower Bound	1	ASCC	-$2,480,306	-$0.46	-$3.17
		MRO	-$67,819,344	-$0.14	-$1.54
		NPCC	$0	$0.00	$0.00
		RF	-$127,626,799	-$0.17	-$1.61
		SERC	-$308,999,959	-$0.24	-$2.98
		TRE	-$2,646,240	-$0.01	-$0.08
		WECC	-$27,406,001	-$0.04	-$0.31
		US[b]	**-$536,978,648**	**-$0.14**	**-$1.38**
Lower Bound	2	ASCC	$0	$0.00	$0.00
		MRO	$0	$0.00	$0.00
		NPCC	$0	$0.00	$0.00
		RF	$0	$0.00	$0.00
		SERC	$0	$0.00	$0.00
		TRE	$0	$0.00	$0.00
		WECC	$0	$0.00	$0.00
		US[b]	**$0**	**$0.00**	**$0.00**
Lower Bound	3	ASCC	$1,416,206	$0.26	$1.81
		MRO	$49,719,145	$0.11	$1.13
		NPCC	$0	$0.00	$0.00
		RF	$77,603,120	$0.11	$0.98
		SERC	$180,941,889	$0.13	$1.74
		TRE	$4,473,014	$0.01	$0.13
		WECC	$103,730,935	$0.15	$1.18
		US[b]	**$417,884,310**	**$0.11**	**$1.07**
Upper Bound	1	ASCC	-$13,667,505	-$2.52	-$17.49
		MRO	-$260,822,493	-$0.55	-$5.91
		NPCC	-$1,366,161	$0.00	-$0.04
		RF	-$241,850,743	-$0.33	-$3.05
		SERC	-$678,995,953	-$0.51	-$6.55
		TRE	-$40,038,963	-$0.10	-$1.20
		WECC	-$78,578,016	-$0.11	-$0.90
		US[b]	**-$1,315,319,835**	**-$0.33**	**-$3.37**

Scenario	Option	NERC[b]	Incremental Pre-Tax Compliance Costs (at 2026; 2024$/year)	Incremental Compliance Costs per Unit of Sales (2024$/MWh)	Incremental Compliance Costs per Residential Household (2024$/year)
Upper Bound	2	ASCC	$0	$0.00	$0.00
		MRO	$0	$0.00	$0.00
		NPCC	$0	$0.00	$0.00
		RF	$0	$0.00	$0.00
		SERC	$0	$0.00	$0.00
		TRE	$0	$0.00	$0.00
		WECC	$0	$0.00	$0.00
		US[b]	**$0**	**$0.00**	**$0.00**
Upper Bound	3	ASCC	$9,304,377	$1.72	$11.91
		MRO	$140,192,248	$0.30	$3.18
		NPCC	$138,457	$0.00	$0.00
		RF	$132,952,433	$0.18	$1.68
		SERC	$373,470,308	$0.28	$3.60
		TRE	$22,510,907	$0.06	$0.67
		WECC	$124,488,122	$0.17	$1.42
		US[b]	**$803,056,852**	**$0.20**	**$2.06**

a. This analysis assumes full pass-through of all compliance costs to retail electricity prices.
b. Unmanaged CRL compliance costs are zero in the HICC region and this region is therefore omitted from the presentation.
Sources: U.S. EPA Analysis, 2026; U.S. EIA, 2025a, 2025b; 2025c.

3.4 Assessment of Social Costs

Social costs include costs incurred by both private entities and the government (*e.g.*, in complying with or issuing permits to implement the regulation). The market prices for labor, equipment, material, and other compliance resources represent the opportunity costs to society for use of those resources in regulatory compliance. The social cost analysis considers costs on an as-incurred, year-by-year basis — that is, this analysis associates each cost component to the year(s) in which they are assumed to occur relative to the assumed rule promulgation and technology implementation years. This section summarizes the analysis.

For the analysis of social costs, the EPA estimated a plant- and year-explicit schedule of technology implementation cost outlays that reflects the "no later than date" for each option. For the baseline and Option 2, the schedule is based on plant owners installing technologies to meet the applicable limits no later than the end of 2029. For Options 1 and 3, the deadline is December 2034. As described in section 3.1, the EPA assumed that plants would implement technologies over several years leading to this deadline as their permits are renewed to incorporate the applicable limits. For the baseline and Option 2, technology implementation years run from 2027 through 2029. For Options 1 and 3, the technology implementation years run from 2030 through 2034. The useful life of the technology extends for 20 years past the last year of technology installation. Thus, the full analysis period for all options for the estimation of social costs is 28 years: 2027-2054, as shown by the undiscounted costs over this period and accounted for in the total and annualized costs presented in Table 3-20.

The EPA used the pre-tax compliance costs as the basis of the social cost analysis. After creating a cost-incurrence schedule for each cost component, EPA summed the costs expected to be incurred in each year for each plant, then aggregated these costs to estimate the total costs for each year in the analysis period. Specifically, the EPA assumed that capital costs for compliance technology equipment, installation, site preparation, construction, and other upfront, non-annually recurring outlays associated with compliance with the regulatory options are incurred in the modeled compliance year for each plant. Annual fixed O&M costs, including regular annual monitoring, and annual variable O&M costs (e.g., operating labor, maintenance labor and materials, electricity required to operate wastewater treatment systems, chemicals)

are incurred each year. For chemical precipitation, other non-annual recurring maintenance costs are incurred every 6 years, beginning in the technology implementation year.

Following the approach used for previous ELG rulemakings, after technology implementation costs were assigned to the year of occurrence, the EPA adjusted these costs for change between 2024 (the year when costs were estimated) and the year(s) of their incurrence as follows:

- All technology costs, except planning, were adjusted to their incurrence year(s) using the Construction Cost Index (CCI) from McGraw Hill Construction Engineering News-Record (2025) and the Gross Domestic Product (GDP) implicit price deflator index published by the U.S. Bureau of Economic Analysis (BEA, 2025).
- Planning costs were adjusted to their incurrence year(s) using the Employment Cost Index (ECI) from the Bureau of Labor Statistics (BLS, 2025) and the GDP implicit price deflator.

The CCI and ECI adjustment factors were developed only through the year 2033; thereafter, the EPA assumed that the real change in prices is zero — that is, costs are expected to change in line with general inflation. The EPA judges this to be a reasonable approach, given that capital expenditures will occur by 2029 and that there is inevitably uncertainty in long-term future price projections.

After developing the year-explicit schedule of undiscounted costs and adjusting them for predicted real change to the year of their incurrence, the EPA calculated the present value of these cost outlays as of the anticipated rule promulgation year by discounting the cost in each year back to 2026 using a 3 percent and 7 percent discount rates, following the Office of Management and Budget (OMB) regulatory analysis guidance in Circular A-4 (OMB, 2003). The EPA calculated the constant annual equivalent value (annualized value), again using the 3 percent and 7 percent discount rates, over the 28-year analysis period for all three options. The time profile for the undiscounted costs and the estimated social costs are shown in Table 3-20.

The EPA assumed in its social cost analysis that the regulatory options do not affect the aggregate quantity of electricity that will be sold to consumers and, thus, that the proposed rule's social cost will include no changes in consumer and producer surplus *from changes in electricity sales* by the electricity industry in aggregate. Given the small impact of the regulatory options on electricity production cost for the total industry and relatively inelastic electricity demand with respect to price, at least in the short term (Burke & Abayasekara, 2018; Bernstein and Griffin (2005)), this approach is reasonable for the social cost analysis.

Where the regulatory options require the application of BPJ to determine the appropriate limits—as is the case under Option 1 for plants with discharges of unmanaged CRL that the permitting authority determines are the functional equivalent of a direct discharge to WOTUS—there will be additional administrative costs for state and federal National Pollutant Discharge Elimination System (NPDES) permitting authorities to administer the rule. The proposed rule does not change permit application requirements or the associated review, nor does it increase the number of permits issued to steam electric power plants. It may, however, increase the efforts involved in developing or reviewing such permits. Where BPJ is used, the permit writer must consider the same statutory factors the EPA would use in promulgating a national effluent guideline regulation, but apply the factors to the circumstances specific to the permit applicant (U.S. EPA, 2010). Permitting authorities establishing site-specific requirements

may spend non-trivial effort and resources.[4] For this proposed rule, permit writers are expected to consider highly site-specific factors to each individual plant, such as volumes of surrounding aquifers, feasibility of pumping and capturing groundwater, different hydrogeological conditions of the site, and volumes and locations of discharges of unmanaged CRL. The EPA also notes that permit authorities may also need to conduct a site-specific analysis whenever water quality based effluent limits must be written into a permit (this proposal does not change that). Furthermore, BPJ-based limitations can also be more burdensome for permit applicants and other parties that engage in the process. However, as part of the 2024 Rule, the EPA did not revise the administrative burden downward to account for burden reductions associated with that ELG relative to BPJ permitting. Thus, the burden associated with BPJ permitting is already incorporated in the ICR for the NPDES program, and this rule does not affect the earlier burden estimates. The EPA requests comments on the magnitude of these potential costs.

Table 3-18 presents annualized incremental social costs for the analyzed regulatory options, as compared to the baseline.

The cost savings shown in Table 3-18 are high end estimates and do not account for any costs that may be incurred because of BPJ requirements set by the permitting authorities. The EPA does not have the data to determine which plants would have a functionally equivalent direct discharge and therefore cannot determine the corresponding BPJ requirements and their costs to entities. To the extent that the permit writers' in states determine BPJ requirements and costs including state administrative costs, these costs would reduce the cost savings of the proposed rule.

Table 3-18: Summary of Estimated Incremental Annualized Costs for Options Relative to Baseline (Millions of 2024$)

Scenario	Option	Annualized Incremental Costs 3% Discount	Annualized Incremental Costs 7% Discount
Lower Bound	1	-$446.2	-$531.9
	2	$0.0	$0.0
	3	$375.6	$250.5
Upper Bound	1	-$1,089.8	-$1,286.3
	2	$0.0	$0.0
	3	$715.7	$475.2

Source: U.S. EPA Analysis, 2026.

[4] As was described in U.S. EPA (2015b), there are a number of sources and tools that permit writers may consult to set limits based on BPJ highlight the potential burden. According to the permit writer manual (U.S. EPA, 2010), these sources include: (1) Permit file information (current and previous NPDES application forms; previous NPDES permit and fact sheet; discharge monitoring reports; compliance inspection reports); (2) Information from existing facilities and permits (NPDES permits issued to other facilities in the same region or state, or that include case-by-case limitations for the same pollutants; toxicity reduction evaluations for selected industries; other media permit files (*e.g.*, Resource Conservation and Recovery Act permit applications and Spill Prevention Countermeasure and Control plans); ICIS-NPDES data; literature (*e.g.*, technical journals and books)); (3) ELG development and planning information (industry experts within the EPA headquarters, EPA Regions, and states; Development Documents, Clean Water Act section 308 questionnaires, screening and verification data, proposed and final regulations, contractor's reports, and project officer contacts; the EPA's Technical Support Documents and records supporting the EPA's biennial effluent guidelines program plans); (4) Statistical guidance (ELG Technical Development Support Documents); (5) Economics guidance (Protocol and Workbook for Determining Economic Achievability for NPDES Permits; BCT Cost Test Guidance).

Table 3-19 provides additional temporal detail of the absolute costs calculated for the three options under the lower bound and upper bound cost scenarios. The table compiles, for each option, the modeled time profiles of technology implementation costs incurred, as well as the annualized costs. The costs shown in this table represent absolute costs, and not the incremental costs of this proposal. The EPA presents these costs here because they are important to the legal rationale for the proposed rule.

Under the baseline, the maximum technology implementation outlays are incurred over the years 2027 through 2029, *i.e.*, during the estimated window when steam electric power plants are expected to implement wastewater treatment technologies for unmanaged CRL. For Options 1 and 3, the maximum technology outlays are incurred in 2030 through 2034. Differences in both the magnitude and timing of the outlays contribute to differences in the direction of incremental costs under the options when compared to the baseline. This is illustrated in the time profile of incremental costs over the full analysis period for social costs of the rule in Table 3-20.

Table 3-19 and Table 3-20 both show undiscounted costs in rows labelled by year and net present total value and annualized costs in the rows at bottom.

Table 3-19: Time Profile of Absolute Undiscounted Total Costs with Discounted Total and Annualized Costs by Option (Millions of 2024$)

Year	Lower Bound Option 1	Lower Bound Option 2	Lower Bound Option 3	Upper Bound Option 1	Upper Bound Option 2	Upper Bound Option 3
2027		$2,262.1			$5,554.1	
2028		$1,837.3			$3,918.1	
2029		$888.2			$2,073.2	
2030	$112.5	$427.2	$1,701.8	$112.5	$875.1	$3,629.8
2031	$153.9	$430.2	$1,037.1	$153.9	$881.2	$3,624.6
2032	$74.7	$430.2	$1,564.5	$74.7	$881.2	$3,414.1
2033	$589.0	$440.0	$3,265.7	$589.0	$910.4	$6,959.6
2034	$97.3	$432.6	$1,649.0	$97.3	$890.7	$3,715.3
2035	$97.3	$432.3	$869.2	$97.3	$888.2	$1,625.5
2036	$98.1	$430.2	$869.2	$98.1	$881.2	$1,625.5
2037	$98.3	$430.2	$869.2	$98.3	$881.2	$1,625.5
2038	$97.8	$430.2	$869.2	$97.8	$881.2	$1,625.5
2039	$97.7	$440.0	$869.2	$97.7	$910.4	$1,625.5
2040	$97.3	$432.6	$869.2	$97.3	$890.7	$1,625.5
2041	$97.3	$432.3	$869.2	$97.3	$888.2	$1,625.5
2042	$98.1	$430.2	$869.2	$98.1	$881.2	$1,625.5
2043	$98.3	$430.2	$869.2	$98.3	$881.2	$1,625.5
2044	$97.8	$430.2	$869.2	$97.8	$881.2	$1,625.5
2045	$97.7	$438.4	$869.2	$97.7	$905.5	$1,625.5
2046	$97.3	$431.8	$869.2	$97.3	$887.5	$1,625.5
2047	$97.3	$431.2	$869.2	$97.3	$884.7	$1,625.5
2048	$98.1	$430.2	$869.2	$98.1	$881.2	$1,625.5
2049	$98.3	$430.2	$869.2	$98.3	$881.2	$1,625.5
2050	$97.7		$869.2	$97.7		$1,625.5
2051	$97.6		$869.2	$97.6		$1,625.5
2052	$97.3		$869.2	$97.3		$1,625.5
2053	$97.3		$869.2	$97.3		$1,625.5
2054	$97.5		$869.2	$97.5		$1,625.5

Year	Lower Bound Option 1	Lower Bound Option 2	Lower Bound Option 3	Upper Bound Option 1	Upper Bound Option 2	Upper Bound Option 3
Total Value in 2026, 3%	$1,940.6	$10,313.4	$17,361.7	$1,940.6	$22,389.9	$35,818.8
Annualized Costs[a], 3%	$108.2	$608.9	$968.0	$108.2	$1,322.0	$1,997.1
Total Value in 2026, 7%	$1,188.3	$7,644.3	$10,685.2	$1,188.3	$16,800.3	$22,567.7
Annualized Costs[a], 7%	$95.3	$633.8	$856.9	$95.3	$1,392.9	$1,809.9

a. Costs for Options 1 and 3 are annualized over 25 years whereas costs for Option 2 are annualized over 23 years. While total present value costs are directly comparable across options, appropriate caution should be exercised in comparing annualized costs across options given differing annualization periods in this table.
Source: U.S. EPA Analysis, 2026.

Table 3-20: Time Profile of Incremental Undiscounted Costs with Discounted Total and Annualized Costs to Society Relative to the Baseline by Option (Millions of 2024$)

Year	Lower Bound Option 1	Lower Bound Option 2	Lower Bound Option 3	Upper Bound Option 1	Upper Bound Option 2	Upper Bound Option 3
2027	-$2,262.1	$0.0	-$2,262.1	-$5,554.1	$0.0	-$5,554.1
2028	-$1,837.3	$0.0	-$1,837.3	-$3,918.1	$0.0	-$3,918.1
2029	-$888.2	$0.0	-$888.2	-$2,073.2	$0.0	-$2,073.2
2030	-$314.7	$0.0	$1,274.6	-$762.6	$0.0	$2,754.8
2031	-$276.3	$0.0	$606.9	-$727.3	$0.0	$2,743.3
2032	-$355.6	$0.0	$1,134.2	-$806.5	$0.0	$2,532.8
2033	$149.0	$0.0	$2,825.7	-$321.4	$0.0	$6,049.2
2034	-$335.2	$0.0	$1,216.4	-$793.3	$0.0	$2,824.6
2035	-$334.9	$0.0	$437.0	-$790.9	$0.0	$737.3
2036	-$332.1	$0.0	$439.0	-$783.1	$0.0	$744.3
2037	-$332.0	$0.0	$439.0	-$782.9	$0.0	$744.3
2038	-$332.4	$0.0	$439.0	-$783.4	$0.0	$744.3
2039	-$342.4	$0.0	$429.2	-$812.7	$0.0	$715.1
2040	-$335.2	$0.0	$436.7	-$793.3	$0.0	$734.8
2041	-$334.9	$0.0	$437.0	-$790.9	$0.0	$737.3
2042	-$332.1	$0.0	$439.0	-$783.1	$0.0	$744.3
2043	-$332.0	$0.0	$439.0	-$782.9	$0.0	$744.3
2044	-$332.4	$0.0	$439.0	-$783.4	$0.0	$744.3
2045	-$340.7	$0.0	$430.8	-$807.9	$0.0	$720.0
2046	-$334.4	$0.0	$437.4	-$790.2	$0.0	$738.0
2047	-$333.9	$0.0	$438.0	-$787.4	$0.0	$740.8
2048	-$332.1	$0.0	$439.0	-$783.1	$0.0	$744.3
2049	-$332.0	$0.0	$439.0	-$782.9	$0.0	$744.3
2050	$97.7	$0.0	$869.2	$97.7	$0.0	$1,625.5
2051	$97.6	$0.0	$869.2	$97.6	$0.0	$1,625.5
2052	$97.3	$0.0	$869.2	$97.3	$0.0	$1,625.5
2053	$97.3	$0.0	$869.2	$97.3	$0.0	$1,625.5
2054	$97.5	$0.0	$869.2	$97.5	$0.0	$1,625.5
Total Value in 2026[b], 3%	-$8,624	$0.0	$7,259.8	-$21,062.8	$0.0	$13,831.8
Annualized Costs[a,b], 3%	-$446.2	$0.0	$375.6	-$1,089.8	$0.0	$715.7
Total Value in 2026[b], 7%	-$6,907.9	$0.0	$3,253.8	-$16,704.9	$0.0	$6,171.2
Annualized Costs[a,b], 7%	-$531.9	$0.0	$250.5	-$1,286.3	$0.0	$475.2

a. Costs are annualized over the full 28 years for all options.
b. The total and annualized costs are based on one technology cycle of undiscounted costs for the rule options. The time profile of undiscounted costs for multiple cycles through 2100 are presented in Table A-1 in the Appendix.
Source: U.S. EPA Analysis, 2026.

As Table 3-20 shows, the annualized social cost savings of the rule are $446.2 to $1,089.8 in millions of 2024 dollars at a 3% discount rate and $531.9 to $1,286.4 in millions of 2024 dollars at a 7% discount rate. These are the social costs of the rule.

3.5 Assessment of Potential Impacts on Small Entities – Regulatory Flexibility Act (RFA) Analysis

In accordance with the requirements of the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, and as it has consistently done in developing effluent limitations guidelines and standards, EPA assessed whether the regulatory options would have "a significant impact on a substantial number of small entities" (SISNOSE).

The EPA used the same methodology and assumptions used for the analysis of the 2024 rule (U.S. EPA, 2024b), including data on plant ownership and entity size. See Section 8 of the 2024 RIA for details.

The approach generally entails: (1) Identifying the domestic parent entities of steam electric power plants; (2) Determining which of those domestic parent entities are small entities, based on the U.S. Small Business Administration (SBA) size standards (SBA, 2023); (3) Assessing the change in potential impact of the regulatory options on those small entities by comparing the estimated entity-level annualized compliance cost to entity-level revenue; and (4) Assessing the change in whether those small entities incurring potentially significant impacts represent a substantial number of small entities. For this analysis, the EPA estimated the cost-to-revenue ratios for the reanalyzed baseline of the 2024 rule. The EPA then compared the results of the options to those of the baseline to assess the changes under the options.

Table 3-21 presents the total number of entities with steam electric power plants as well as the number and percentage of those entities determined to be small. This analysis uses the same two cases described in section 3.2.2 to extrapolate the ownership information available for the explicitly modeled subset of plants to the full steam electric industry: Case 1, which assumes that the surveyed owners represent all owners (any non-surveyed plants are owned by the same surveyed entities and maximizes the number of plants owned by any given entity); and Case 2 which assumes that the non-surveyed owners are different from those surveyed but have similar characteristics.

Table 3-21: Number of Entities by Sector and Size (for Two Ownership Cases of the Number of Entities Owning Steam Electric Power Plants)

Ownership Type	Small Entity Size Standard	Case 1 Total	Case 1 Small	Case 1 % Small	Case 2 Total	Case 2 Small	Case 2 % Small
Cooperative	number of employees	24	21	88%	30	27	90%
Federal	assumed large	2	0	0%	7	0	0%
Investor-owned	number of employees[a]	55	16	29%	86	21	24%
Municipality	50,000 population served	48	22	46%	82	30	36%
Nonutility	number of employees[a]	67	50	75%	144	112	78%
Other Political Subdivision	50,000 population served	11	2	18%	23	2	9%
State	assumed large	2	0	0%	2	0	0%
Total		**209**	**111**	**53%**	**373**	**191**	**51%**

a. Entity size may be based on revenue, depending on the NAICS sector and applicable SBA size standard.
Source: U.S. EPA Analysis, 2026.

As described above, the EPA developed estimates of the number of small parent entities in the specified cost-to-revenue impact ranges. Table 3-22 summarizes the results of the analysis for the baseline and the lower and upper bound cost scenarios. In terms of *number* of entities in each of the impact categories, the analysis results for each option are the same under Case 1 and Case 2; however, these numbers represent different percentages of all small entities owning steam electric power plants under each weighting case.

Table 3-22: Estimated Cost-To-Revenue Impact on Small Parent Entities for the Baseline

Scenario	Option	Case 1 ≥1% Number of small entities (out of total of 111 small entities)	Case 1 ≥1% % of all small entities[b]	Case 1 ≥3%[a] Number of small entities (out of total of 111 small entities)	Case 1 ≥3%[a] % of all small entities[b]	Case 2 ≥1% Number of small entities (out of total of 191 small entities)	Case 2 ≥1% % of all small entities[b]	Case 2 ≥3%[a] Number of small entities (out of total of 191 small entities)	Case 2 ≥3%[a] % of all small entities[b]
Lower Bound	Baseline	7	6%	6	5%	7	4%	6	3%
Upper Bound	Baseline	13	12%	8	7%	13	7%	8	4%

a. The number of entities with cost-to-revenue impact of at least three percent is a subset of the number of entities with such ratios exceeding one percent.
b. Percentage values are calculated relative to the total of 111 (Case 1) and 191 (Case 2) small entities owning steam electric power plants.
Source: U.S. EPA Analysis, 2026.

Table 3-23 presents the changes in impacts to small entities under each of the options relative to the baseline. Option 1 is estimated to result in fewer entities incurring significant impacts. Overall, the EPA estimated 5 and 11 fewer small entities would incur costs greater than one percent of revenue under Option 1 for the bounding scenarios, relative to the baseline, and 4 and 6 fewer small entities would incur costs greater than three percent of revenue. For Option 3, the changes go in the opposite direction, showing that 3 more small entities have impacts greater than one percent of revenue, and 2 more entities have impacts greater than three percent of revenue.

Table 3-23: Estimated Cost-To-Revenue Impact on Small Parent Entities by Option

Scenario	Option	Case 1 ≥1% Number of small entities (out of total of 111 small entities)	Case 1 ≥1% % of all small entities[b]	Case 1 ≥3%[a] Number of small entities (out of total of 111 small entities)	Case 1 ≥3%[a] % of all small entities[b]	Case 2 ≥1% Number of small entities (out of total of 191 small entities)	Case 2 ≥1% % of all small entities[b]	Case 2 ≥3%[a] Number of small entities (out of total of 191 small entities)	Case 2 ≥3%[a] % of all small entities[b]
Lower Bound	1	-5	-5%	-4	-4%	-5	-3%	-4	-2%
	2	0	0%	0	0%	0	0%	0	0%
	3	1	1%	1	1%	1	1%	1	1%
Upper Bound	1	-11	-10%	-6	-5%	-11	-6%	-6	-3%
	2	0	0%	0	0%	0	0%	0	0%
	3	3	3%	2	2%	3	2%	2	1%

a. The number of entities with cost-to-revenue impact of at least three percent is a subset of the number of entities with such ratios exceeding one percent.
b. Percentage values are calculated relative to the total of 111 (Case 1) and 191 (Case 2) small entities owning steam electric power plants.
Source: U.S. EPA Analysis, 2026.

This rule does not cause adverse impacts on small entities. In fact, Option 1, the preferred option, is estimated to result in fewer small entities incurring significant impacts. Between 5 and 11 fewer small entities will experience impacts exceeding one percent of revenue as a direct result of this rule if finalized, and between 4 and 6 fewer small entities will experience impacts exceeding three percent of revenue.

3.6 Unfunded Mandates Reform Act (UMRA) Analysis

Title II of the Unfunded Mandates Reform Act of 1995, Pub. L. 104-4, requires that federal agencies assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector.

Under UMRA section 202, the EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that might result in expenditures by State, local, and Tribal governments, in the aggregate, or by the private sector, of $100 million (adjusted annually for inflation) or more in any one year (*i.e.*, about $200 million in 2024 dollars).

The EPA estimated the unmanaged CRL compliance costs associated with each of the regulatory options for different categories of entities. The proposed rule (Option 1) results in cost savings relative to the 2024 rule baseline and the UMRA requirements therefore do not apply to the proposed rule.

The EPA estimated that Option 3 has a *maximum compliance cost of in any one year* to government entities (excluding federal government) that is $66.7 million higher than the baseline under the lower bound cost scenario and $113.2 million higher under the upper bound cost scenario.[5,6] The *maximum compliance cost in any given year* to the private sector is $1,206 million higher than the 2024 rule baseline under the lower bound cost scenario and $2,013 million higher under the upper bound cost scenario.[7] From these compliance cost values, the EPA determined that Option 3 rule would contain a mandate that may result in expenditures of $200 million (in 2024 dollars) or more for the public (including State, local, and Tribal governments) and private sectors in any one year.

4 Benefits

This section summarizes the national environmental benefits due to changes in unmanaged CRL discharges from steam electric power plants. Following the approach used in prior steam electric rulemakings, the benefit categories associated with the proposed rule regulatory options 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. Data limitations, modeling limitations, and gaps in the understanding of how society values certain environmental changes expected to result from changes to unmanaged CRL discharges prevented the EPA from quantifying and monetizing the benefits of this proposed rule. The EPA assessed benefits qualitatively, indicating their direction and potential magnitude where possible.

The following section summarizes the EPA's analysis of the benefit categories the EPA was able to identify to various degrees. The analysis builds on the environmental assessment documented in a separate memo titled "Environmental Assessment Memorandum for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category - Unmanaged Combustion Residual Leachate" (U.S. EPA, 2026b, hereafter the environmental assessment memo).

4.1 Environmental Effects

Changes in the quality of surface waters, aquatic habitats and ecological functions under the regulatory options depend on several factors, including the operational characteristics of steam electric power plants,

[5] Maximum costs are costs incurred by the entire universe of steam electric power plants in a given year of occurrence under a given regulatory option. For Option 3, the maximum costs to government entities are incurred in 2031. For the baseline, the maximum costs to government entities are incurred in 2027.

[6] For this analysis, rural electric cooperatives are considered to be a part of the private sector.

[7] For Option 3, the maximum costs to the private sector are incurred in 2033. For the baseline, the maximum costs to the private sector are incurred in 2027.

treatment technologies implemented to control pollutant levels and meet permitted limits, and the hydrography of reaches receiving steam electric pollutant discharges, among others.

The EPA first assessed the pollutant loadings achieved through the implementation of the wastewater treatment technologies under the regulatory options. This included reanalyzing the loadings results from the implementation of the 2024 rule based on the revised definitions of the lower and upper bound scenarios and compliance approaches. The EPA then estimated incremental reductions under the regulatory options relative to this reanalyzed baseline of the 2024 rule.

To represent the average pollutant concentrations for unmanaged CRL, the EPA used average pollutant concentrations for CRL calculated from data compiled from the 2015 ELG and 2024 ELG. However, due to the lack of pollutant concentration data available for each analyte in unmanaged CRL, as well as the highly variable impact of ambient groundwaters on pollutant concentrations in unmanaged CRL, the EPA estimated loadings of total suspended solids (TSS) and total dissolved solids (TDS) only. The selection of TSS and TDS ensures that the sum of these two metrics does not double count other pollutants that potentially may be present in unmanaged CRL, which the EPA is unable to numerically quantify due to lack of available data. As described in the environmental assessment memo (U.S. EPA, 2026b), untreated CRL also contains high concentrations of chloride, sulfate, calcium, sodium, and magnesium, as well as various other pollutants such as selenium, cobalt, arsenic, mercury, chromium. Table 4-1 summarizes the estimated pollutant loads under each of the three options and the lower and upper bound scenarios.

The loading reductions estimated under Option 1 reflect the seven plants that the EPA identified as discharging unmanaged CRL that is mixed with groundwater before being captured and pumped to the surface for treatment before discharge directly to a WOTUS. The analysis does not account for additional pollutant loading reductions under Option 1 that may result from treatment required to meet limits established based on BPJ at plants with discharges of unmanaged CRL that the permitting authority determines are the functional equivalent of a direct discharge to WOTUS, which would be subject to limitations based on BPJ under Option 1. This is consistent with the cost analysis where the EPA assumed that the costs of BPJ-required treatment are not attributable to the proposed rule (*i.e.*, if the costs are not attributable to the rule, then the loading reductions are also not attributable to the rule).

Table 4-1: Summary of Estimated Pollutant Loadings under the Options (Pounds TSS + TDS per Year)

Option	Loadings TSS + TDS Lower Bound	Loadings TSS + TDS Upper Bound
1	597,000,000	1,220,000,000
2	584,000,000	1,190,000,000
3	0	0

Source: U.S. EPA, 2026a

Table 4-2 presents the changes in pollutant loads relative to the baseline. The values are obtained by subtracting the baseline loadings (represented by Option 2) from the loadings resulting from each regulatory option and the corresponding lower or upper bound scenario. Negative incremental loadings (for Option 3) represent reductions in pollutant loads in unmanaged CRL discharges, whereas positive incremental loadings (for Option 1) denote increases.

Table 4-2: Summary of Incremental Pollutant Loadings under the Options Relative to the Baseline (Pounds TSS + TDS per Year)

Option	Incremental Loadings TSS + TDS Lower Bound	Incremental Loadings TSS + TDS Upper Bound
1	12,900,000	29,800,000
2	0	0
3	-584,000,000	-1,190,000,000

Source: U.S. EPA, 2026a

The proposed rule is expected to have other non-water quality environmental impacts. The EPA estimates that the proposed rule may result in changes in air emissions associated with the generation of the electricity required to power treatment systems and with fuel combustion to transport solid waste generated. Similar to the analysis above, the EPA conducted this analysis in two stages. First, the EPA estimated the non-water quality environmental impacts of implementing the treatment technologies under each option, including the baseline. Table 4-3 summarizes these impacts. Second, the EPA estimated the incremental impacts under the regulatory options relative to the baseline. Table 4-4 summarizes these incremental impacts. As shown in this table, the proposed rule (Option 1) reduces total electrical energy usage, fuel consumption, air emissions, and waste generation as compared to the baseline. The opposite is true for Option 3, which shows increasing non-water quality environmental impacts relative to the baseline. See the Technical Development Document (TDD) for details (U.S. EPA, 2026a).

Table 4-3: Summary of Estimated Non-Water Quality Environmental Impacts

Pollutants	Option	Total Lower Bound	Total Upper Bound
Total Electrical Energy Usage (MWh)	1	32,100	32,100
	2	165,000	351,000
	3	2,220,000	4,510,000
Total Fuel (Thousand Gallons)	1	109	109
	2	295	406
	3	1,060	1,460
Total NO_X (Thousand Tons/Year)[a]	1	0.004	0.004
	2	0.01	0.03
	3	0.13	0.25
Total SO_2 (Thousand Tons/Year)	1	0.002	0.002
	2	0.01	0.02
	3	0.11	0.23
Total Solids Generated (Tons/Year)	1	347,000	347,000
	2	1,660,000	3,380,000
	3	5,990,000	12,200,000

a The estimates reflect emissions from power consumption to operate wastewater treatment systems (see total electrical energy usage) and total fuels. The estimates do not account for any potential changes in the profile of electricity generation.
Source: U.S. EPA, 2026a.

Table 4-4: Summary of Incremental Non-Water Quality Environmental Impacts Relative to the Baseline

Pollutants	Option	Increment from 2024 Rule Baseline Lower Bound	Increment from 2024 Rule Baseline Upper Bound
Total Electrical Energy Usage (MWh)	1	-133,000	-319,000
	2	0	0
	3	2,050,000	4,160,000
Total Fuel (Thousand Gallons)	1	-185	-296
	2	0	0
	3	766	1,054
Total NO_X (Thousand Tons/Year)[a]	1	-0.01	-0.02
	2	0	0
	3	0.12	0.23
Total SO_2 (Thousand Tons/Year)	1	-0.01	-0.02
	2	0	0
	3	0.10	0.21
Total Solids Generated (Tons/Year)	1	-1,320,000	-3,030,000
	2	0	0
	3	4,320,000	8,780,000

a The estimates reflect emissions from power consumption to operate wastewater treatment systems (see total electrical energy usage) and total fuels. The estimates do not account for any potential changes in the profile of electricity generation.
Source: U.S. EPA, 2026a.

Because of uncertainty on the baseline pollutant levels in the unmanaged CRL in a functionally equivalent discharge, the EPA did not model changes in water quality in the receiving waters. Instead, the EPA qualitatively assessed the benefits of the proposed rule based on the nature and expected direction of changes and the scope of waters and resources located downstream from plants with unmanaged CRL discharges. Thus, in cases where pollutant loadings are estimated to increase relative to the 2024 rule baseline, the EPA assesses that water quality in receiving waters may decline relative to the baseline (though site-specific factors make it impossible to assess whether those changes would materially impact compliance with any water quality standards applicable to the receiving body). Similarly, in cases where changes in leachate treatment reduce power consumption and trucking, the EPA assesses air quality and other impacts as improving. Table 4-5 summarizes the results of the EPA's assessment of the direction of water quality changes and other impacts under each scenario and regulatory option.

Table 4-5: Assessment of the Direction of Water Quality Changes in Waters Receiving Unmanaged CRL Discharges and Other Impacts by Scenario, Option, and Discharge Type

Option	Discharge Type[a]	Lower Bound (63 Plants) Number of Plants	Lower Bound (63 Plants) Direction of Water Quality Changes[b]	Lower Bound (63 Plants) Direction of Other Impacts[c]	Upper Bound (111 Plants) Number of Plants	Upper Bound (111 Plants) Direction of Water Quality Changes[b]	Upper Bound (111 Plants) Direction of Other Impacts[c]
1	Type 1	56	decline	improve	104	decline	improve
	Type 2	7	no change	no change	7	no change	no change
2	Type 1	56	no change	no change	104	no change	no change
	Type 2	7	no change	no change	7	no change	no change

Option	Discharge Type[a]	Lower Bound (63 Plants) Number of Plants	Lower Bound (63 Plants) Direction of Water Quality Changes[b]	Lower Bound (63 Plants) Direction of Other Impacts[c]	Upper Bound (111 Plants) Number of Plants	Upper Bound (111 Plants) Direction of Water Quality Changes[b]	Upper Bound (111 Plants) Direction of Other Impacts[c]
3	Type 1	56	improve	decline	104	improve	decline
	Type 2	7	improve	decline	7	improve	decline

a. Type 1 = unmanaged CRL that the permitting authority determines is the functional equivalent of a direct discharge to WOTUS through groundwater; Type 2 = unmanaged 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 WOTUS
b. "decline" = increased pollutant loads relative to the 2024 rule baseline; "improve" = reduced pollutant loads relative to the 2024 rule baseline; "no change" pollutant loads are the same as under the 2024 rule baseline
c. "decline" = increased electricity consumption and trucking requirements relative to the 2024 rule baseline; "improve" = decreased electricity consumption and trucking requirements relative to the 2024 rule baseline; "no change" electricity consumption and trucking requirements are the same as under the 2024 rule baseline
Source: U.S. EPA Analysis, 2026.

4.2 Benefits Analysis

As described above, the EPA estimates that the proposed rule may affect the quality of receiving waters. These changes in turn may affect human and ecological health exposed to metals and toxic pollutants in the discharges. The environmental assessment identifies resources affected by unmanaged CRL discharges that indicate potential pathways of human exposure to unmanaged CRL pollutants. Discharges of metals and toxic pollutants in unmanaged CRL may affect human health through the ingestion of self-caught fish from affected reaches (*e.g.*, arsenic, mercury, lead), whereas bromide discharges can promote the formation of trihalomethanes and other disinfection by-products in drinking water supplied by public water systems with intakes affected by the discharges. In the environmental assessment, the EPA identified nine receiving waters that do not meet the criteria for their fish consumption designated use and 15 PWSs with intakes either within receiving waters or within five miles downstream from CRL discharges (U.S. EPA, 2026b).[8]

The surface water quality changes described in the previous section may affect aquatic and wildlife habitat, water-based recreation (*e.g.*, fishing, swimming, boating, and near-water activities), aesthetic value, and nonuse value from changes in ecosystem health. For some receiving waters, the proposed rule may result in changes in improved habitat conditions for plants, invertebrates, fish, and amphibians, and the wildlife that prey on aquatic organisms, including enhanced protection of threatened and endangered (T&E) species. In the environmental assessment, the EPA identified 61 reaches that receive CRL discharges and also intersect with designated habitats for federally listed T&E species that live in aquatic habitats for several life history stages and/or species that obtain a majority of their food from aquatic sources (U.S. EPA, 2026b).[11]

By changing discharges of total suspended sediment that contribute to turbidity, the proposed rule may also result in changes in water treatment costs for municipal drinking water systems located downstream from steam electric plant impoundments or landfills that have unmanaged CRL. Changes in sediment discharge may affect sedimentation in reservoirs and navigable waters and change the frequency of maintenance dredging.

[8] The scope of the proximity analyses conducted for the environmental assessment is the conterminous United States and therefore excludes one facility in Alaska.

The non-water quality environmental effects of the regulatory options are expected to result in changes in air pollutant levels at the regional or local levels through changes in energy used by steam electric power plants to operate the unmanaged CRL treatment and transportation-related emissions due to the changes in trucking of waste. The EPA estimated changes in emissions of nitrogen oxides (NO_X) and sulfur dioxide (SO_2), which are both precursors to ambient fine particulate matter ($PM_{2.5}$). NO_X emissions are also a precursor to ambient ground-level ozone. The change in emissions alters the ambient concentrations, which in turn leads to changes in population exposure. Studies have demonstrated the attributable effects of $PM_{2.5}$ and ozone exposure on premature mortality and morbidity outcomes, including heart attacks, strokes, asthma, lung cancer, allergic symptoms, and nervous system effects among others (U.S. EPA, 2019a, 2019b, 2020b, 2022). See section 8.3 in the 2024 BCA for additional discussion (U.S. EPA, 2024a).

As summarized in Table 4-5, the non-water quality environmental effects of the regulatory options go in the opposite direction as water quality effects in terms of environmental improvements, so whereas Option 1 results in forgone water quality benefits it has positive non-water quality benefits. Option 3 has positive water quality benefits but forgone non-water quality benefits. The EPA does not have sufficient data to assess the direction of total benefits for a regulatory option when considering both water quality and non-water quality benefits together.

5 Comparison of Social Costs and Benefits

Under Option 1, effluent limitations would be established on a site-specific basis using BPJ, and resulting compliance measures and costs may differ from those assumed in the baseline and the three regulatory options analyzed for this proposal. In some cases, permitting authorities may determine that less extensive controls are appropriate given site-specific conditions, which could lower compliance costs as compared to the baseline but also forgo pollutant load reductions and the associated benefits. The analysis detailed in this memo looks at an extreme case by essentially attributing no compliance costs to the proposed rule and estimating forgone pollutant load reductions for all plants that are potentially subject to BPJ.

In other cases, site-specific information may support more stringent controls, particularly where unmanaged CRL discharges have a clear connection to surface water exposure pathways, potentially resulting in greater environmental and human health benefits than previously anticipated (as well as possibly greater compliance costs). Permit writers must consider the relationship between effluent reductions, receiving water characteristics, and downstream uses when establishing BPJ limits. This framework supports the selection of effluent limits that achieve environmental and human health benefits without imposing requirements that would result in minimal environmental gain or potential forgone environmental benefits.

The magnitude of potential benefits is uncertain and depends on the number of plants with unmanaged CRL discharges that meet the definition of a functionally equivalent discharge under the ELGs, and any eventual limits set by permitting authorities based on best professional judgment. However, even to the extent that the proposed rule results in less stringent limits for all plants where BPJ will apply, as the EPA conservatively assumed under both the lower and upper bound cost scenarios, the EPA estimates the forgone benefits of the proposed rule to be less than the substantial cost savings the Agency estimated.

6 Limitations and Uncertainties

Important sources of uncertainty in this analysis include which plants generate unmanaged CRL discharges subject to the ELGs, and, in the case where BPJ is used to set limits (Option 1), which controls permitting authorities will determine as appropriate given site-specific conditions.

The EPA cannot prospectively determine how many or which instances of CRL discharged through groundwater would ultimately be found to require Clean Water Act permits. To be a covered discharge, there must be a discharge (or functionally equivalent discharge) of pollutants from a point source into a WOTUS. The EPA used bounding scenarios to identify the steam electric plants that may be subject to the ELGs. The bounding scenarios consider factors indicative of the potential for an unmanaged CRL discharge to be present (i.e., the presence of landfills or surface impoundments that are not clean closed or composite lined, total estimated groundwater pumping rate greater than 0.5 gpm, and corrective action for groundwater exceedances based on the site's most recent groundwater monitoring reported in the CCR database). The EPA determined that between 63 and 111 power plants may be discharging unmanaged CRL, but permitting authorities would ultimately determine whether unmanaged CRL is discharged on a site-specific case-by-case basis. The number of steam electric plants with unmanaged CRL discharges may ultimately be less than estimated in this analysis, which would also reduce the incremental costs and benefits.

With respect to the second source of uncertainty, by attributing no cost for BPJ and forgoing loading reductions, the EPA implicitly assumed for Option 1 that BPJ would require no treatment of unmanaged CRL before discharge. This is one end of the range of possibilities. Instead, permit writers may consider site-specific factors to set limits similar to those achievable with chemical precipitation or even require zero liquid discharge for unmanaged CRL. In these cases, the cost savings, forgone loading reductions, and avoided non-water quality impacts under Option 1 would be less than presented in this analysis.

7 References

Bernstein, M. A., & Griffin, J. (2005). *Regional Differences in the Price-Elasticity of Demand For Energy*. RAND Corporation. https://www.rand.org/pubs/technical_reports/TR292.html

Burke, P. J., & Abayasekara, A. (2018). The price elasticity of electricity demand in the United States: A three-dimensional analysis. *The Energy Journal*, *39*(2).

Dun & Bradstreet. (2026). *Hoovers Data Services* (Version [Data set]).

McGraw Hill Construction Engineering News-Record. (2025). *Construction Cost Index (CCI)*

North American Electric Reliability Corporation. (undated). *About NERC: Key Players: ERO Enterprise | Regional Entities*. https://www.nerc.com/AboutNERC/keyplayers/Pages/default.aspx

U.S. Bureau of Economic Analysis. (2025). *Table 1.1.9. Implicit Price Deflators for Gross Domestic Product*. Retrieved from https://apps.bea.gov/iTable/?reqid=19&step=3&isuri=1&1921=survey&1903=13#eyJhcHBpZCI6MTksInN0ZXBzIjpbMSwyLDMsM10sImRhdGEiOltbIk5JUEFfVGFibGVfTGlzdCIsIjEzIl0sWyJDYXRlZ29yaWVzIiwiU3VydmV5Il0sWyJGaXJzdF9ZZWFyIiwiMTkyOSJdLFsiTGFzdF9ZZWFyIiwiMjAyNSJdLFsiU2NhbGUiLCIwIl0sWyJTZXJpZXMiLCJBIl1dfQ==

U.S. Bureau of Labor Statistics. (2025). *Employment Cost Index: Total compensation for All Civilian workers in All industries and occupations, Index Dec 2005=100, Quarterly, Not Seasonally Adjusted* https://fred.stlouisfed.org/series/CIU10100000000000I

U.S. Energy Information Administration. (2025a). *Annual Electric Power Industry Report, Form EIA-861 detailed data files* https://www.eia.gov/electricity/data/eia861/

U.S. Energy Information Administration. (2025b). *Annual Energy Outlook 2025*. Retrieved from https://www.eia.gov/outlooks/aeo/

U.S. Energy Information Administration. (2025c). *Form EIA-860 Detailed Data: Annual Release 2024 Final Data* https://www.eia.gov/electricity/data/eia860/
U.S. Environmental Protection Agency. (2010). *NPDES Permit Writer's Manual*. (EPA-833-K-10-001). Retrieved from https://www.epa.gov/system/files/documents/2025-09/pwm_2010_edits_2025_06.pdf
U.S. Environmental Protection Agency. (2015a). *Benefit and Cost Analysis for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category*. (EPA-821-R-15-005).
U.S. Environmental Protection Agency. (2015b). *Regulatory Impact Analysis for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category*. (EPA-821-R-15-004).
U.S. Environmental Protection Agency. (2019a). *Integrated Science Assessment for Particulate Matter*. (EPA/600/R-19/188). Retrieved from https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=347534
U.S. Environmental Protection Agency. (2019b). *Supplement to the 2019 Integrated Science Assessment for Particulate Matter (Final Report)*. (EPA/600/R-22/028). Retrieved from https://www.epa.gov/isa/integrated-science-assessment-isa-particulate-matter
U.S. Environmental Protection Agency. (2020a). *Benefit and Cost Analysis for Revisions to the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category*. (EPA-821-R-20-003).
U.S. Environmental Protection Agency. (2020b). *Integrated Science Assessment for Ozone and Related Photochemical Oxidants*. (EPA/600/R-20/012).
U.S. Environmental Protection Agency. (2020c). *Regulatory Impact Analysis for Revisions to the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category*. (EPA-821-R-20-004).
U.S. Environmental Protection Agency. (2022). *Supplement to the 2019 Integrated Science Assessment for Particulate Matter*. (EPA/600/R-22/028). Retrieved from https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=354490#tab-3
U.S. Environmental Protection Agency. (2023). *Documentation for EPA's Power Sector Modeling Platform v6 Using the Integrated Planning Model Post-IRA 2022 Reference Case*. Retrieved from https://www.epa.gov/system/files/documents/2023-03/EPA%20Platform%20v6%20Post-IRA%202022%20Reference%20Case.pdf
U.S. Environmental Protection Agency. (2024a). *Benefit and Cost Analysis for Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category*. (821-R-24-006).
U.S. Environmental Protection Agency. (2024b). *Regulatory Impact Analysis for Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category*. (821-R-24-007).
U.S. Environmental Protection Agency. (2026a). *Engineering Memorandum for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category - Unmanaged Combustion Residual Leachate (DCN SE12105)*.
U.S. Environmental Protection Agency. (2026b). *Environmental Assessment Memorandum for the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category - Unmanaged Combustion Residual Leachate (DCN SE12102)*.
U.S. Office of Management and Budget. (2003). *Circular A-4: Regulatory Analysis*. Retrieved from https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4
U.S. Small Business Administration. (2023). *Table of Small Business Size Standards Matched to North American Industry Classification System Codes. Effective March 17, 2023*. Retrieved from https://www.sba.gov/document/support-table-size-standards

8 Appendix

Table A-1: Time Profile of Incremental Undiscounted Costs to Society Relative to the Baseline by Option (Millions of 2024$)

Year	Lower Bound Option 1	Lower Bound Option 2	Lower Bound Option 3	Upper Bound Option 1	Upper Bound Option 2	Upper Bound Option 3
2027	-$2,262.1	$0.0	-$2,262.1	-$5,554.1	$0.0	-$5,554.1
2028	-$1,837.3	$0.0	-$1,837.3	-$3,918.1	$0.0	-$3,918.1
2029	-$888.2	$0.0	-$888.2	-$2,073.2	$0.0	-$2,073.2
2030	-$314.7	$0.0	$1,274.6	-$762.6	$0.0	$2,754.8
2031	-$276.3	$0.0	$606.9	-$727.3	$0.0	$2,743.3
2032	-$355.6	$0.0	$1,134.2	-$806.5	$0.0	$2,532.8
2033	$149.0	$0.0	$2,825.7	-$321.4	$0.0	$6,049.2
2034	-$335.2	$0.0	$1,216.4	-$793.3	$0.0	$2,824.6
2035	-$334.9	$0.0	$437.0	-$790.9	$0.0	$737.3
2036	-$332.1	$0.0	$439.0	-$783.1	$0.0	$744.3
2037	-$332.0	$0.0	$439.0	-$782.9	$0.0	$744.3
2038	-$332.4	$0.0	$439.0	-$783.4	$0.0	$744.3
2039	-$342.4	$0.0	$429.2	-$812.7	$0.0	$715.1
2040	-$335.2	$0.0	$436.7	-$793.3	$0.0	$734.8
2041	-$334.9	$0.0	$437.0	-$790.9	$0.0	$737.3
2042	-$332.1	$0.0	$439.0	-$783.1	$0.0	$744.3
2043	-$332.0	$0.0	$439.0	-$782.9	$0.0	$744.3
2044	-$332.4	$0.0	$439.0	-$783.4	$0.0	$744.3
2045	-$340.7	$0.0	$430.8	-$807.9	$0.0	$720.0
2046	-$334.4	$0.0	$437.4	-$790.2	$0.0	$738.0
2047	-$333.9	$0.0	$438.0	-$787.4	$0.0	$740.8
2048	-$332.1	$0.0	$439.0	-$783.1	$0.0	$744.3
2049	-$332.0	$0.0	$439.0	-$782.9	$0.0	$744.3
2050	-$2,164.4	$0.0	-$1,392.9	-$5,456.4	$0.0	-$3,928.6
2051	-$1,739.7	$0.0	-$968.1	-$3,820.6	$0.0	-$2,292.6
2052	-$790.8	$0.0	-$18.9	-$1,975.9	$0.0	-$447.7
2053	-$329.9	$0.0	$442.0	-$777.7	$0.0	$750.5
2054	-$332.8	$0.0	$439.0	-$783.7	$0.0	$744.3
2055	-$317.7	$0.0	$1,271.6	-$768.7	$0.0	$2,748.6
2056	-$286.1	$0.0	$597.1	-$756.4	$0.0	$2,714.2
2057	-$357.9	$0.0	$1,131.9	-$816.0	$0.0	$2,523.4
2058	$156.7	$0.0	$2,833.5	-$299.2	$0.0	$6,071.4
2059	-$332.9	$0.0	$1,218.7	-$783.9	$0.0	$2,834.0
2060	-$332.9	$0.0	$439.0	-$783.9	$0.0	$744.3
2061	-$332.1	$0.0	$439.0	-$783.1	$0.0	$744.3
2062	-$341.7	$0.0	$429.2	-$812.1	$0.0	$715.1
2063	-$334.8	$0.0	$436.7	-$792.9	$0.0	$734.8
2064	-$334.6	$0.0	$437.0	-$790.5	$0.0	$737.3
2065	-$332.9	$0.0	$439.0	-$783.9	$0.0	$744.3
2066	-$332.9	$0.0	$439.0	-$783.9	$0.0	$744.3
2067	-$332.1	$0.0	$439.0	-$783.1	$0.0	$744.3
2068	-$340.1	$0.0	$430.8	-$807.2	$0.0	$720.0
2069	-$334.0	$0.0	$437.4	-$789.7	$0.0	$738.0
2070	-$333.6	$0.0	$438.0	-$787.1	$0.0	$740.8
2071	-$332.9	$0.0	$439.0	-$783.9	$0.0	$744.3
2072	-$332.9	$0.0	$439.0	-$783.9	$0.0	$744.3
2073	-$2,164.0	$0.0	-$1,392.9	-$5,456.0	$0.0	-$3,928.6
2074	-$1,739.0	$0.0	-$968.1	-$3,819.8	$0.0	-$2,292.6
2075	-$790.4	$0.0	-$18.9	-$1,975.5	$0.0	-$447.7
2076	-$329.7	$0.0	$442.0	-$777.5	$0.0	$750.5
2077	-$332.9	$0.0	$439.0	-$783.9	$0.0	$744.3
2078	-$332.9	$0.0	$439.0	-$783.9	$0.0	$744.3

Year	Lower Bound Option 1	Lower Bound Option 2	Lower Bound Option 3	Upper Bound Option 1	Upper Bound Option 2	Upper Bound Option 3
2079	-$342.5	$0.0	$429.2	-$812.9	$0.0	$715.1
2080	-$320.1	$0.0	$1,269.3	-$778.2	$0.0	$2,739.1
2081	-$278.3	$0.0	$604.8	-$734.3	$0.0	$2,736.4
2082	-$355.6	$0.0	$1,134.2	-$806.5	$0.0	$2,532.8
2083	$158.7	$0.0	$2,835.5	-$292.3	$0.0	$6,078.4
2084	-$332.9	$0.0	$1,218.7	-$783.9	$0.0	$2,834.0
2085	-$342.7	$0.0	$429.2	-$813.0	$0.0	$715.1
2086	-$334.4	$0.0	$436.7	-$792.6	$0.0	$734.8
2087	-$334.0	$0.0	$437.0	-$789.9	$0.0	$737.3
2088	-$332.4	$0.0	$439.0	-$783.4	$0.0	$744.3
2089	-$332.6	$0.0	$439.0	-$783.6	$0.0	$744.3
2090	-$332.9	$0.0	$439.0	-$783.9	$0.0	$744.3
2091	-$341.0	$0.0	$430.8	-$808.2	$0.0	$720.0
2092	-$333.7	$0.0	$437.4	-$789.4	$0.0	$738.0
2093	-$333.0	$0.0	$438.0	-$786.4	$0.0	$740.8
2094	-$332.4	$0.0	$439.0	-$783.4	$0.0	$744.3
2095	-$332.6	$0.0	$439.0	-$783.6	$0.0	$744.3
2096	-$2,164.8	$0.0	-$1,392.9	-$5,456.8	$0.0	-$3,928.6
2097	-$1,739.9	$0.0	-$968.1	-$3,820.8	$0.0	-$2,292.6
2098	-$790.0	$0.0	-$18.9	-$1,975.1	$0.0	-$447.7
2099	-$329.0	$0.0	$442.0	-$776.8	$0.0	$750.5
2100	-$332.5	$0.0	$439.0	-$783.5	$0.0	$744.3