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July 27, 2009

Carey A. Johnston
Water Docket, Environmental Protection Agency
Mailcode 4203M
1200 Pennsylvania Ave., NW
Washington, DC 20460

Attention: Docket ID No. EPA-HQ-OW-2008-0517

Re: *Comments of Earthjustice On EPA's 2008 Effluent Guidelines Program And Suggestions For The 2009 Annual Review: Steam Electric Power Generation.*

Dear Mr. Johnston,

We respectfully submit these comments on the U.S. Environmental Protection Agency's ("EPA") evaluation of the effluent limitation guidelines ("ELGs") set forth in 40 C.F.R. Part 423 for steam electric power generation. We call on EPA to set ELGs that eliminate all pollutant discharges from scrubber and ash handling systems and all discharge of leachate from land-based coal combustion waste ("CCW") disposal. For decades, CCW effluents have poisoned drinking water and ecosystems with mercury, arsenic, selenium, cadmium, lead and other toxic metals. Now, EPA's research shows that eliminating all discharge of these CCW effluents is possible through the use of the best available technology economically achievable ("BAT").

The data that EPA already has compiled in this docket, particularly the findings in EPA's 2007/2008 Detailed Study Report, justify updating the effluent limits in this sector without further delay.[1] In the absence of applicable ELG standards, many states are failing to require installation of the most effective, economically feasible water-pollution controls as the Clean Water Act demands. To the extent that states have set any limits on discharge from scrubber, ash handling, and leachate treatment systems, they have done so based on best professional judgment ("BPJ").[2] This BPJ-based permitting has led to inconsistent and unjustifiably weak effluent limits. In connection with this rulemaking the Utility Water Act Group ("UWAG") provided EPA with data on scrubber use, ash handling practices, and

[1] *See* EPA, *Steam Electric Power Generating Point Source Category: 2007/2008 Detailed Study Report* (2008), *available at* http://www.epa.gov/guide/304m/2008/steam-detailed-200809.pdf (821-R-08-011, DCN 05516) ("Detailed Study Report").

[2] *See* 33 U.S.C. § 1342(a); *see also* 40 C.F.R. § 125.3(a)(iii)-(v) (referring to "effluent limitations established on a case-by-case basis based on Best Professional Judgment (BPJ).")

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pollutant discharges from 86 power plants that together operate over 75% of all installed wet FGD scrubbers in the sector.[3] Outfalls at these plants discharge CCW effluent containing cadmium at concentrations ranging from 0.1 micrograms per liter (ug/L) to 30 ug/L, lead concentrations from 1 ug/L to 280 ug/L and mercury concentrations from 0.1 ug/L to over 13 ug/L.[4] The permitted concentrations of arsenic, a known human carcinogen, are an astonishing 500 times higher at the highest discharging plant than at the lowest.[5] These disparities highlight the need for EPA to set stringent national standards in the ELGs to protect public health and the environment.

Updated national standards are also critical to protecting the public and the environment from the health risks created by CCW landfills, impoundments, and other disposal sites where CCW is stored in contact with groundwater. EPA estimates that of the 131 million tons of CCW generated in 2007 some 62%, or 81 million tons, were disposed of in landfills, surface impoundments, and old mines.[6] This CCW is toxic to many organisms including people. Exposure to the numerous trace metals in CCW disturbs the metabolism of vertebrates, causes respiratory impairments, and a range of hormonal, physiological, and other toxic impacts, including death.[7] Animals who come into contact with CCW or CCW-contaminated waters naturally absorb and transport these trace metals, further contaminating nearby ecosystems, and the effects of contamination are observable for decades.[8]

Data compiled by EPA in the past decade reveal alarming levels of leakage from CCW landfills, impoundments, and basins into drinking water supplies.[9] New emerging data suggest that the health consequences are grave.[10] For example, recent studies in Pennsylvania document a statistically significant link between environmental contamination from waste coal

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[3] EPA, *UWAG Form 2C Effluent Guidelines Database* (2008) (EPA Doc. ID EPA-HQ-OW-2006-0771-1650.1) ("*Form 2C Database*"). For a description of this database and descriptive statistics about these plants, *see* EPA, *Detailed Study Report*, *supra* at 2-11, 2-12, 3-30 (2008), *available at* http://www.epa.gov/guide/304m/2008/steam-detailed-200809.pdf (821-R-08-011, DCN 05516).

[4] *See* EPA, *Form 2C Database, supra*.

[5] *See id*. Compare the 500 ug/L arsenic concentration reported at the Michigan City Generating Station outfall 301 (Indiana, NPDES Permit No. IN0000116) with the 1 ug/L concentrations reported at TVA's Widows Creek plant (Alabama, NPDES Permit No. AL0003875) and Cumberland plant (Tennessee, NPDES Permit No. TN0005789), or with the 1 ug/L concentration at the Meremec Power Plant in Missouri (NPDES Permit No. MO-0000361).

[6] *See Hearing on Coal Combustion Waste Storage and Water Quality*, before the U.S. H.R. Comm. on Transportation and Infrastructure, Subcomm. on Water Resources and Environment, 111th Cong. (Apr. 30, 2009) (testimony of Barry Breen, Acting Assistant Administrator Office of Solid Waste and Emergency Response U.S. EPA), *available at* http://transportation.house.gov/hearings/Testimony.aspx?TID=10034&NewsID=884.

[7] *See id*. (testimony of Dr. Conrad Volz, Assistant Professor of Environmental and Occupational Health, University of Pittsburgh).

[8] *See id*.

[9] *See* Office of Solid Waste, EPA, *Coal Combustion Waste Damage Case Assessments* (2007) *available at* http://www.regulations.gov (Docket ID No. EPA-HQ-RCRA-2006-0796-0015) ("*Damage Case Assessments*").

[10] *See, e.g.*, EPA, *Human and Ecological Risk Assessment of Coal Combustion Wastes* ES-1 (2007) *available at* http://www.regulations.gov (Docket ID No. EPA-HQ-RCRA-2006-0796-0009) ("*Human and Ecological Risk Assessment*") (documenting the significantly elevated cancer, health, and ecological risks created by unlined or inadequately lined CCW disposal facilities).

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plants and Superfund sites in eastern Pennsylvania, and a cluster of rare and deadly cases of the blood cancer polycythemia vera.[11] In the face of such threats, EPA should not delay further in revising the outdated ELGs for Steam Electric Power Generation.

I. EPA Should Revise the ELGs to Address Toxic Metals Discharges.

EPA should revise the ELGs to address toxic metals, which are present in all CCW effluents. While the National Research Council ("NRC") reports that water contaminated by CCW often contains over 20 toxic metals,[12] the current ELGs address only five metals, and only seven pollutants in all – copper, chlorine, chromium, iron, oil & grease, total suspended solids, and zinc.[13]

EPA should therefore revise all subparts of 40 C.F.R. Part 423 to add effluent limitations for the following pollutants, all of which, according to the NRC, are common in effluent discharges from coal plants: Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium III, Chromium VI, Cobalt, Fluoride, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, and Vanadium.[14] Because many of these metals can partially dissolve in wastewater, EPA also should set overall limits on total dissolved solids to address toxic metal pollution.

II. EPA Should Set Zero Discharge Effluent Limitations for Scrubber, Ash Handling, and Leachate Treatment Systems.

EPA should set zero discharge limits for scrubber, ash handling, and leachate treatment systems. The Clean Water Act compels EPA to eliminate all existing discharges of pollution wherever possible by setting BAT standards that "require the elimination of discharges of all

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[11] *See* Bill O'Boyle, *Study Finds Possible Cancer Link, Report: Toxins may be cause of rare blood cancer cases in parts of Luzerne, Carbon, and Schuylkill counties*, The Times Leader, Feb. 4, 2009, *available at* http://www.timesleader.com/news/Study_finds_possible_cancer_link_02-04-2009.html. *See also* V. Seaman, et al., *Use of Molecular Testing to Identify a Cluster of Patients with Polycythemia Vera in Eastern Pennsylvania*, 18 Cancer Epidemiology Biomarkers & Prevention 534 (Feb. 2009), *available at* http://cebp.aacrjournals.org/cgi/content/abstract/18/2/534 (peer-reviewed scientific article).

[12] *See* Committee on Mine Placement of Coal Combustion Wastes, National Research Council, *Managing Coal Combustion Residue In Mines* 42 (2006), *available at* http://books.nap.edu/catalog.php?record_id=11592#toc ("*Managing CCR In Mines*").

[13] *See* 40 C.F.R. §§ 423.13, 423.15. In addition, standards for cooling tower maintenance additives forbid the use of the 126 priority pollutants.

[14] *See* Committee on Mine Placement of Coal Combustion Wastes, National Research Council, *Managing CCR In Mines*, *supra* at 42. *See also* Los Angeles Regional Water Quality Control Board, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements For City of Los Angeles Department of Water and Power (Harbor Generating Station), Permit No. CA0000361* (2003) *available at*: www.epa.gov/npdescan/CA0000361FP.pdf (setting effluent limits for: selenium, silver, copper, cadmium, lead, mercury, arsenic, hexavalent chromium, nickel and zinc); Pennsylvania DEP, *Authorization to Discharge Under the National Pollutant Discharge Elimination System NPDES Permit No. PA0001627* (2007) (NPDES permit for Orion Power Midwest, L.P.'s Cheswick Power Station, setting effluent limits at Outfall 002 for: selenium, silver, copper, cadmium, beryllium, thallium, iron, manganese, aluminum, and hexavalent chromium).

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pollutants if the Administrator finds . . . that such elimination is technologically and economically achievable."[15] Similarly, the act demands that new source performance standards ("NSPS") include, "where practicable, a standard permitting no discharge of pollutants."[16] The federal courts have stated clearly that "Congress intended these limitations to be based on the performance of the single best-performing plant in an industrial field."[17] Under the Clean Water Act, a technology is "available" where EPA has evidence that its use is practicable within the relevant industry even if the technology is not currently in use. "That no plant in a given industry has adopted a pollution control device which could be installed does not mean that the device is not 'available.'"[18] A point source may be required to use superior technology proven in another context if the Administrator determines that a technology transfer is practicable.[19] Where, as here, zero discharge has been demonstrated as an economically achievable control option at numerous plants studied by EPA, the agency should set zero discharge standards.

A. FGD Scrubber Systems

The rising use of scrubber systems means that more toxic metals will be discharged to drinking water every year absent effective revision of the ELGs. Although it is now feasible to eliminate all discharge from scrubbers, EPA has noted that "the move toward advanced treatment systems is not universal and some plants have reported that they intend to use existing or new settling ponds to treat the wastewater from new scrubbers."[20] To prevent this unlawful resort to an old technology in place of the best available pollution controls, the agency should require the complete elimination of CCW effluent discharges at both new and existing sources.

Zero discharge of pollutants is BAT for FGD scrubbers. According to EPA's own detailed study, nearly 40% of all surveyed facilities with an operational wet FGD scrubber achieve zero liquid discharge.[21] These plants have adopted a mix of technologies to eliminate all discharges. The simplest methods include the precipitation of high levels of chlorides as solid FGD waste to enable wastewater recycling.[22] Other more advanced methods include evaporation and distillation of effluent, which has been demonstrated abroad and is available for use in the United States.[23] Additional advanced technologies under consideration include the use of reverse osmosis and advanced biological treatment to remove metals.[24] Thus, zero

[15] 33 U.S.C. § 1311(b)(2)(A).
[16] *Id*. § 1316(a)(1).
[17] *Chem. Mfrs. Ass'n v. EPA*, 870 F.2d 177, 226 (5th Cir. 1989).
[18] *Hooker Chems. & Plastics Corp. v. Train*, 537 F.2d 620, 636 (2d Cir. 1976).
[19] *See, e.g., Tanner's Council of Am. v. Train*, 540 F.2d 1188, 1192 (4th Cir. 1976) (transfer permissible if the technology can be practicably applied); *see also Reynolds Metals Co. v. EPA*, 760 F.2d 549, 562 (4th Cir. 1985) (treatment technology from aluminum forming industry transferable to can-making industry).
[20] EPA, *Detailed Study, supra* at 3-34.
[21] *See id*. at 3-30.
[22] *See id*. at 3-4.
[23] *See id.* at 3-41.
[24] *See id*. at 3-31, 3-32, 3-44.

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discharge from scrubber systems is technologically and economically achievable and therefore represents both the BAT and NSPS level of performance.

B. Ash Handling Systems

Fly ash and bottom ash handling systems also can achieve zero discharge through available technologies. In fact, many handling systems for fly ash already achieve zero discharge.[25] There is no reason why systems for bottom ash cannot achieve zero discharge as well.[26] Dry bottom ash handling technology exists, is manufactured by leading ash handling machinery companies, and is affordable.[27] Power plants can convert their ash handling systems from wet to dry handling at reasonable cost. Duke Energy, for example, states that it is already in the process of converting all of its ash handling facilities to dry processes.[28] While wet bottom ash handling poses a greater risk of discharge than dry handling, even plants using wet handling can achieve zero or near-zero discharge of pollution. EPA already has found two plants that segregate bottom ash handling water and completely recycle it much of the time, discharging the wastewater only if it accumulates and volume control becomes necessary.[29]

C. CCW Leachate

EPA should also determine whether the technologies that justify setting zero discharge limits for FGD scrubbers and ash handling systems also require EPA to set zero discharge limits for leachate treatment systems at CCW storage and disposal facilities. Leachate from CCW landfills is similar in composition to the ash handling wastewater and FGD scrubber blowdown discussed above. We therefore expect that EPA will conclude that complete elimination of this discharge is feasible and required under the Clean Water Act.

III. EPA Should Revise the ELGs to Control Unpermitted Leakage from CCW Disposal Facilities.

Coal-fired power plants have disposed of hundreds of millions of tons of CCW in leaking impoundments, landfills, and settling ponds across the country. This long history of poorly regulated coal ash disposal has left a legacy of toxic contamination in lakes, rivers, and

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[25] *See* 40 C.F.R. § 423.15(g) (requiring that for all plants built after 1983 "[t]here shall be no discharge of wastewater pollutants from fly ash transport water.") S*ee also* EPA, *Detailed Study, supra* at 3-46 (discussing common dry fly ash handling operations).

[26] A comparison of the influent data provided in EPA's detailed study shows that the pollutants and concentrations in bottom ash handling waters are largely comparable to those found in FGD scrubber discharge, suggesting that the technologies used to achieve zero discharge at scrubbers are available and transferable to ash handling systems. *Compare* EPA, *Detailed Study Report*, *supra* at 3-21 – 3-23; *id*. at 3-50 – 3-52.

[27] *See e.g.*, Press Release, United Conveyor Corporation, *United Conveyor Corporation Unveils VAX Vibratory Ash Extractor for Utility Providers* (Jan. 19, 2009), *available at* http://news.thomasnet.com/fullstory/823522.

[28] *See* Duke Energy, *Form 10-K* 144 (2007), *available at* http://www.sec.gov/idea/searchidea/webusers.htm ("Duke Energy currently estimates that it will . . . convert [coal combustion waste] handling systems from wet to dry systems.")

[29] *See* EPA, *Detailed Study Report*, *supra* at 3-47.

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streams that comprise important drinking water sources and wildlife habitat. The discharge of toxic metals from these disposal facilities into surface waters violates the Clean Water Act and poses unacceptable risks to public health and the environment.

EPA should establish best management practices ("BMPs") that require removal and remediation of unsafe disposal facilities and the use of construction, design, and wastewater treatment practices at new facilities that eliminate future risks of discharge. EPA has authority under the Clean Water Act to take needed action to regulate coal ash impoundments, landfills, and settling ponds. All of these ash sites are point sources of water pollution.[30] Pollutants conveyed into surface waters through leakages into groundwater are unlawfully discharged.[31] In many areas throughout the country, particularly in the east, where coal plants were built on the banks of rivers, CCW disposal facilities are located immediately beside surface waters or on top of groundwater supplies that are hydrologically connected to navigable waters and their tributaries. Thus, polluted wastewater that escapes these containment structures is discharged in violation of the Clean Water Act.

These illegal discharges are causing major environmental harms. EPA has documented dozens of "damage cases" where ground and surface waters have been polluted by CCW leachate escaping from disposal facilities.[32] There are also many more sites where damage from improper CCW disposal is suspected but investigations are incomplete,[33] and new cases have emerged since the release of EPA's damage case assessment in 2007.[34]

Moreover, EPA recently concluded that leaking CCW leachate creates a significant cancer risk. At unlined landfills the leaching of arsenic into drinking water alone poses an excess cancer risk of 1 in 2000.[35] This is 50 times higher than EPA's maximum risk threshold of one in 100,000, and this figure does not include the excess cancer risks from other CCW

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[30] *See* 33 U.S.C. § 1362(14) ("The term 'point source' means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.")

[31] *See, e.g.*, *Williams Pipe Line Co. v. Bayer Corp.*, 964 F. Supp. 1300, 1320-21 (S.D. Iowa 1997) (adopting "majority view" that the CWA "regulates any pollutants that enter waters of the United States either directly or through groundwater."); *se ealso* 33 U.S.C. § 1311(a) ("Except as in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title, the discharge of any pollutant by any person shall be unlawful.").

[32] *See* Office of Solid Waste, EPA, *Damage Case Assessments*, *supra*.

[33] By August 2007 the agency had information on 135 potential damages cases in at least 26 states. Of the 135 damage cases, EPA classified 67 as fully proven damage cases. The other 68 cases comprised 6 minefills that EPA considered beyond the scope of the study, some number of cases where pollution was inadequately documented, and several cases where it was impossible to determine conclusively whether CCW was causing damage to ground and surface waters. Therefore, it is possible that nearly all 135 of the sites that EPA identified are leaching contaminants. *See*, EPA, *Notice of Data Availability on the Disposal of Coal Combustion Wastes in Landfills and Surface Impoundments*, 72 Fed. Reg. 49,714 (Aug. 29, 2007).

[34] *See, e.g.*, James Bruggers, *Indiana Ash Ponds Pollute Bird Habitat, Drinking Water*, Louisville Courier-Journal, Feb. 23, 2009, *available at*: http://www.courier-journal.com/article/20090223/NEWS02/90223002.

[35] *See* EPA, *Human and Ecological Risk Assessment*, *supra*.

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pollutants that leach into drinking water along with arsenic.[36] Unlined surface impoundments are even more dangerous, posing up to a 1 in 50 excess cancer risk from arsenic, which is nearly 2,000 times EPA's target risk level.[37]

Faced with these risks, EPA should use its authority under Section 304(e) to establish BMPs applicable to all CCW disposal facilities and settling ponds in order to prevent leaks. EPA has authority to set BMPs when it determines that "plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage" associated with the facility "may contribute significant amounts of [pollution] to navigable waters."[38] The agency's implementing regulations make it clear that permits must include BMPs where authorized under 304(e) or where otherwise reasonably necessary to carry out the purpose and intent of the Clean Water Act.[39] In its recent study of damage cases, EPA determined that CCW disposal, as well as runoff and leakage from that waste disposal, generates significant water pollution. EPA should therefore use its authority under § 304(e), as it has done in other sectors, to stop ongoing water pollution by adding BMPs that supplement the numeric effluent limits in 40 C.F.R. Part 423.[40]

The BMPs should: (1) require the removal and remediation of all unlined landfills, open basins, ponds, and surface impoundments that are located in floodplains and that supply drinking water and other important ecological services; (2) ensure that remaining facilities are carefully monitored; and (3) prevent CCW disposal facilities from placing CCW into contact with groundwater. With respect to new CCW disposal sites, EPA should required that they be double-lined, never built in floodplains, and always built to handle a 100-year storm event without overflowing.

The BMPs also should require new and existing facilities to install groundwater monitoring systems adequate to determine whether CCW leachate reaches groundwater. A federal baseline to define adequate monitoring is vital because the minimal groundwater monitoring currently required in many states is inadequate to determine whether unpermitted discharge of leachate is occurring.[41] Indeed, according to EPA, two thirds of all surface impoundments nationwide lacked any groundwater monitoring as recently as 1999.[42] The BMPs for groundwater monitoring should require that wells extend deeper than the waste to

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[36] *See Id*.

[37] *See Id*.

[38] *See* 33 U.S.C. § 1314(e).

[39] *See* 40 C.F.R. § 122.44(k).

[40] *See, e.g.*, *id*. §§ 430.03 (establishing BMPs for many plants in the pulp and paper category that supplement numeric effluent limits); 440.148 (establishing BMPs for placer gold mining operations that supplement numeric BPT, BAT, and NSPS standards applicable to these mines).

[41] *See* Clean Air Task Force, *Impacts On Water Quality From Placement of Coal Combustion Waste in Pennsylvania Coal Mines* vi (Jeff Stant ed., 2007), *available at*: http://www.catf.us/publications/reports/PAMinefill.pdf (documenting inadequate groundwater monitoring at multiple CCW minefills in Pennsylvania where partial data suggests that leakage is very likely).

[42] *See Regulatory Determination on Wastes from the Combustion of Fossil Fuels; Final Rule*, 65 Fed. Reg. 32,214, 32,216 (May 22, 2000).

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allow full monitoring of the site. Monitoring should continue in perpetuity, and should take place at least once monthly, after significant rain/wet weather events, and during low flow periods.

IV. EPA Should Revise the ELGs to Address Runoff Contaminated by CCW.

Runoff that contacts CCW is a CCW effluent and should be treated like scrubber blowdown, ash handling water, and leachate. Toxic metals are found in stormwater runoff from coal piles, CCW disposal facilities, and the roads that connect coal plants and their CCW disposal facilities. EPA has long controlled the runoff of stormwater from coal piles, but runoff from onsite CCW disposal facilities and connecting roads is not regulated in Part 423.[43] EPA should ensure that all contaminated stormwater is collected and meets the same zero discharge effluent limits for metals that all other CCW effluents should meet.

In revising the ELGs to better control runoff, EPA should consider the increased likelihood of flood events given anticipated climate change. For example, EPA currently expects coal pile runoff storage units to be built to contain a 10-year, 24-hour storm event, and exempts from effluent limitations any overflow of coal pile runoff from a storage unit that is properly designed to contain that volume.[44] However, global warming is expected to alter regional weather patterns, causing more intense and frequent storms to occur in some parts of the United States. The storm severity that previously typified a once-in-a-decade or once-in-a-century storm may become more common. Facilities designed for the 10-year, 24-hour event of the 1980's or 1990's may be routinely inundated by more frequent storm events in 2030.

In its 2009 Annual Review EPA should revise the Part 401 general provisions, which apply to all ELGs, to include new technical definitions of rainfall and flooding events. These definitions, whether set forth directly or by reference, should account for anticipated climate change impacts on the size and frequency of storms and floods.

Conclusion

EPA has invested considerable time and effort collecting data that confirms the agency's authority and obligation to establish zero discharge limits for CCW effluents from coal-fired power plants through a revision of 40 C.F.R. Part 423. Revision of the current ELGs, which are now 25 years old, is long overdue.

Thank you for considering these comments. Please feel free to contact Abigail Dillen (212-791-1881 ext. 221, adillen@earthjustice.org) with any questions.

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[43] *See* 40 C.F.R. §§ 423.12(b)(9), 423.15(k).

[44] *See id*. §§ 423.12(b)(10), 423.15(l).

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