CLOSING THE FLOODGATES:

HOW THE COAL INDUSTRY IS POISONING OUR WATER AND HOW WE CAN STOP IT

WATERKEEPER® ALLIANCE

ENVIRONMENTAL INTEGRITY PROJECT

CLEAN WATER ACTION

EARTHJUSTICE

BEYOND COAL

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ABOUT THE SPONSORING ORGANIZATIONS

THE ENVIRONMENTAL INTEGRITY PROJECT (EIP) is a nonpartisan, nonprofit organization dedicated to the enforcement of the nation's anti-pollution laws and the prevention of political interference with those laws. The EIP provides objective analysis of how the failure to enforce or implement environmental laws increases pollution and harms public health, and helps local communities obtain the protection of environmental laws.

THE SIERRA CLUB is the nation's oldest and largest grassroots environmental group, with 2.1 million members and supporters. The Sierra Club's Beyond Coal Campaign works to address the pressing public health threat from coal-fired power plants and toward clean energy.

CLEAN WATER ACTION is a one-million member organization of diverse people and groups joined together to protect our environment, health, economic well-being, and community quality of life. Its goals include clean, safe and affordable water; prevention of health threatening pollution; creation of environmentally safe jobs and businesses; and empowerment of people to make democracy work. Clean Water Action organizes strong grassroots groups and coalitions and campaigns to elect environmental candidates and solve environmental and community problems.

EARTHJUSTICE is a non-profit public interest law organization dedicated to protecting the magnificent places, natural resources, and wildlife of this earth, and to defending the right of all people to a healthy environment.

WATERKEEPER ALLIANCE was founded in 1999 by environmental attorney and activist Robert F. Kennedy, Jr., and several veteran Waterkeeper Organizations. It is a global movement of on-the-water advocates who patrol and protect more than 100,000 miles of rivers, streams, and coastlines in North and South America, Europe, Australia, Asia, and Africa. Waterkeeper Organizations combine firsthand knowledge of their waterways with an unwavering commitment to the rights of their communities and to the rule of law.

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DATA LIMITATIONS

The information contained in this report is based on company self-reported data obtained through publicly accessible U.S. Environmental Protection Agency websites and Freedom of Information Act requests. Occasionally, government data may contain errors, either because information is inaccurately reported by the regulated entities or incorrectly transcribed by government agencies. This report is based on data retrieved prior to July 2013, and subsequent data retrievals may differ slightly as some companies correct prior reports.

We are committed to ensuring that the data we present are as accurate as possible. We will correct any errors that are verifiable.

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EXECUTIVE SUMMARY

Coal-fired power plants are the largest source of toxic water pollution in the United States based on toxicity, dumping billions of pounds of pollution into America's rivers, lakes, and streams each year.[1] The waste from coal plants, also known as coal combustion waste, includes coal ash and sludge from pollution controls called "scrubbers" that are notorious for contaminating ground and surface waters with toxic heavy metals and other pollutants.[2] These pollutants, including lead and mercury, can be dangerous to humans and wreak havoc in our watersheds even in very small amounts. The toxic metals in this waste do not degrade over time and many bio-accumulate, increasing in concentration as they travel up the food chain, ultimately collecting in our bodies, and the bodies of our children.

Existing national standards meant to control coal plant water pollution are thirty-one years old and fail to set any limits on many dangerous pollutants. Only now has the U.S. Environmental Protection Agency (EPA) proposed to update these outdated standards, in order to curb discharges of arsenic, boron, cadmium, lead, mercury, selenium, and other heavy metals from coal plants. Although the Clean Water Act requires the EPA and states to set pollution limits for power plants in the absence of federal standards,[3] states have routinely allowed unlimited discharges of this dangerous pollution.

Our review of 386 coal-fired power plants across the country demonstrates that the Clean Water Act has been almost universally ignored by power companies and permitting agencies. Our survey is based on the EPA's Enforcement and Compliance History Online (ECHO) database and our review of discharge permits for coal-fired power plants. For each plant, we reviewed permit and monitoring requirements for arsenic, boron, cadmium, lead, mercury, and selenium; the health of the receiving water; and the permit's expiration date. Our analysis reveals that:

- Nearly 70 percent of the coal plants that discharge coal ash and scrubber wastewater are allowed to dump unlimited amounts of arsenic, boron, cadmium, mercury, and selenium into public waters, in violation of the Clean Water Act.
- Only about 63 percent of these coal plants are required to monitor and report discharges of arsenic, boron, cadmium, mercury, and selenium.
- Only about 17% of the permits for the 71 coal plants discharging into waters impaired for arsenic, boron, cadmium, lead, mercury, or selenium contained a limit for the pollutant responsible for degrading water quality.
- Nearly half of the plants surveyed are discharging toxic pollution with an expired Clean Water Act permit. Fifty-three power plants are operating with permits that expired five or more years ago.

In short, coal plants have used our rivers, lakes, and streams as their own private waste dumps for decades.

These dangerous discharges have serious consequences for communities that live near coal-fired power plants and their dumps across the United States. Tens of thousands of miles of rivers are degraded by this pollution.[4] The EPA has identified more than 250 individual instances where coal plants have harmed ground or surface waters.[5] Because many coal power plants sit on recreational lakes and reservoirs, or upstream of drinking water supplies, those thousands of miles of poisoned waters have an impact on people across the country. Coal water pollution raises cancer risks, makes fish unsafe to eat, and can inflict lasting brain damage on our children.[6]

Americans do not need to live with these dangerous discharges. Wastewater treatment technologies that drastically reduce, and even eliminate, discharges of toxic pollution are widely available, and are already in use at some power plants in the United States.[7] According to the EPA, coal plants can eliminate coal ash wastewater entirely by moving to dry ash handling techniques.[8] Scrubber discharges can also be treated with common sense technologies such as chemical precipitation, biological treatment, and vapor compression to reduce or eliminate millions of tons of toxic pollution.[9]

The EPA's recent proposal to set long overdue standards contains multiple options, including strong

standards that would require the elimination of the majority of coal plant water pollution using technologies that are available and cost-effective. The strongest of these options, called "Option 5" in the proposal, would eliminate almost all toxic discharges, reducing pollution by more than 5 billion pounds a year, and should be the option EPA selects for the final rule. The next strongest option, called Option 4, would eliminate ash-contaminated discharges, and apply rigorous treatment requirements for scrubber sludge, however it would only reduce pollution by 3.3 billion pounds a year, 2 billion less than Option 5. By eliminating or significantly reducing toxic discharges from coal plants, a strong final rule would create hundreds of millions of dollars in benefits every year in the form of improved health and recreational opportunities for all Americans, in addition to the incalculable benefits of clean and healthy watersheds.[10] The EPA estimates that ending toxic dumping from coal plants would cost less than one percent of annual revenue for most coal plants and at most about two pennies a day in expenses for ordinary Americans if the utilities passed some of the cleanup costs to consumers.[11]

Unfortunately, the proposal also includes illegal and weak options inserted by political operatives, rather than EPA scientists. These options would preserve the status quo or do little to control dangerous pollution dumping. Weak options are a giveaway to polluters and Americans deserve better. It is time for the EPA to set strong, national standards to end decades of toxic water pollution, and protect public health and our waters.

PART ONE
YEARS OF NEGLECT AND A CHANCE FOR CHANGE

INTRODUCTION

All across the United States, millions of gallons per day of water pollution — laced with toxic pollutants including arsenic, mercury, selenium, and lead — gush from coal-fired power plants into our rivers, lakes, and streams. Pollution flows from the aging, leaky "ponds" that many plants use to store their toxic slurries of coal ash and smokestack scrubber sludge. Toxic chemicals also seep from unlined ponds and dry waste landfills into ground and surface waters, leaving behind a persistent lethal legacy. All in all, at least 5.5 billion pounds of water pollution is released into the environment by coal power plants every year, and a significant portion of that pollution is made up of toxic chemicals.[12]

These power plants are the largest source of toxic water pollution in the United States, dumping more toxics into our waters than the other top nine polluting industries *combined*.[13] This harmful pollution, including nearly 80,000 pounds per year of arsenic alone,[14] makes its way into waterbodies across the country, into fish and other aquatic life — and into our bodies, though fish and water consumption, swimming, boating, and other activities.[15] Thousands of miles of rivers and streams are already harmed by this pollution, and every year the problem gets worse.

This report, an independent review of hundreds of coal plant wastewater permits, shows that nearly 70 percent of power plant permits set no effluent limits on how much arsenic, boron, cadmium, lead, mercury, and selenium these plants can discharge.[16] Indeed, many permits do not even require monitoring, so regulators, and the public, do not know for certain what poisons are finding their way into the water. Our review focused on these pollutants because they are almost always found in coal ash and scrubber waste and are particularly harmful to health or aquatic life.

The Clean Water Act, when it became law, established a national goal of *ending* all water pollution by 1985.[17] Nearly three decades later, the largest industrial source of toxic water pollution continues to foul our waters essentially unchecked because it is only regulated by minimal standards that were established in 1982. An update is long overdue. Existing rules contain essentially no limits on the amounts of toxic pollutants — including arsenic, mercury, selenium, and lead — that coal plants can dump into our water.[18] The EPA itself admits that these standards "do not adequately address the toxic pollutants discharged from the electric power industry."[19]

Based on toxicity, these power plants are the largest source of toxic water pollution in the United States, dumping more toxics into our waters than the other top nine polluting industries combined. Many plants have nothing more than rudimentary "settling" ponds, which do almost nothing to remove the dissolved heavy metals that make coal water pollution poisonous and dangerous.[20]

Decades of unchecked pollution have put our waterways, our environment, and our health at risk. But now there is an opportunity to change all that. After years of work by research scientists and engineers — as well as determined advocacy by citizens across the country — the EPA has finally proposed to update its outdated standards. The EPA's proposal lays out a menu of options that vary significantly in the amount of pollution they would control. Some of those options are inexcusably and illegally weak. But the strongest options — Option 5, which sets "zero discharge" standards that would require plants to clean up almost entirely and Option 4, which eliminates most discharges and requires comprehensive treatment for the remainder — would cost-effectively move the fleet of coal power plants toward zero discharge of pollutants, protecting our public health and our environment.

In addition to the incalculable benefits of thousands of miles of cleaner rivers and streams that would result from removing these discharges of toxic metals, the rule would also create thousands of jobs and hundreds of millions of dollars in monetary benefits every year in the form of improved health and recreational opportunities across the United States.[21] The coal industry, which has long imposed the costs of its pollution on all of us, can readily absorb the relatively modest cost

of cleaning up its pollution, rather than freely dumping it into rivers. The common-sense treatments required by the EPA's proposed rules are remarkably affordable, amounting to substantially less than one percent of revenue for almost all coal plants, and no more than two pennies a day in expenses for ordinary Americans, if utilities passed costs onto consumers in their electricity bills.[22] In exchange for two cents a day, we could end most toxic water pollution in this country.

The EPA must finalize a zero discharge rule and put us on a path to solving one of our most widespread and harmful pollution problems. It is time to move forward and protect public health and environment.

1. THE TOXIC LEGACY OF COAL PLANT WATER POLLUTION

The 5.5 billion pounds of water pollution from coal power plants every year include at least 1.79 billion pounds of metals, including arsenic, selenium, cadmium, chromium, and mercury.[23] These toxics are hazardous to humans or aquatic life in very small doses (measured in parts per billion) because they do not degrade over time and bio-accumulate, meaning they increase in concentration as they are passed up the food chain. Much of the remaining pollution consists of "nutrients" such as nitrogen and phosphorus, which contribute to thick, soupy algal blooms that can choke watersheds, such as the Chesapeake Bay.[24]

This dumping occurs in astonishing volumes. The EPA estimates that, each year, up to 14.5 billion gallons of fly ash transport water and up to 6.6 billion gallons of bottom ash transport water may be produced at just one power plant and dumped into ash ponds.[25] Making water pollution worse, many plants either have installed, or will soon install, smokestack "scrubbers"—systems that can prevent toxic metals from going up the smokestack into the air. The problem is that scrubbers often concentrate the metals they remove into a wet, toxic, sludge that generally does not undergo any effective treatment.[26] Thanks to stricter air pollution rules, scrubber use has increased by 900 percent since 1982.[27] Yet, there are no standards to ensure protective wastewater treatment of the scrubber sludge, and so this especially toxic new wastewater stream is ending up in settling ponds where it then makes its way into rivers, streams, and lakes.

And that's not all: Toxic pollution also occurs when leachate systems for landfills and ash impoundments discharge untreated or inadequately treated wastewaters.[28] In some cases, coal ash landfills or ponds cover hundreds of acres, fill in local wetlands, and turn streams into drainage ditches for waste that either leak or discharge from these sites.[29] Many of these waste dumps or ponds have no liners to prevent pollution from leaking out of them.[30]

According to the EPA, tens of thousands of miles of rivers are degraded by this pollution.[31] The EPA has already identified 132 separate cases where a power plant contaminated surface waters and another 123 cases where groundwater was damaged. With respect to arsenic, boron, cadmium, iron, lead, manganese, nickel, selenium, and thallium, the 290 coal plants surveyed by EPA put as much of a burden on the environment as thousands of sewage plants.

In addition to those listed opposite, the EPA has identified many other dangerous substances in coal plant wastewater, including chromium, molybdenum, and thallium.[64] In almost every instance, coal plants are the largest source of *each* of these water pollutants nationally.

The EPA calculates that the annual pollution from coal power plants translates into more than eight million TWPE or toxic weighted pound equivalents, indicating a huge toxic burden on the nation's waters.[65] That figure dwarfs the pollution from any other industrial category in the United States and is more than the other top nine polluting industries *combined*—more than all the paper mills in the country, more than all the refineries, more than all the chemical plants and fertilizer facilities and ore mills and incinerators.[66] The waste is also far more toxic than any discharge from a typical publicly-owned treatment works, the sort of sewage plant that serves cities and towns. Scrubber waste alone contains 80 times more selenium than a typical sewage plant's waste.[67] With respect to toxic pollution, the 290 coal plants surveyed by EPA put as much of a burden on the environment as thousands of sewage plants.[68] With hundreds of coal power plants across the country, it is no surprise that coal plant pollution poses such a serious threat to our waterways.

HOW COAL PLANT WATER POLLUTION AFFECTS US

Coal power plants can use millions of gallons of water every day, so most power plants sit on or near a water body. This means that coal plants discharge into hundreds of rivers, lakes, and streams all across the United States. These waters are often popular recreational spots for boating, swimming, and fishing and are drinking water sources for nearby communities. Fishing provides an inexpensive, reliable, and healthy food source, but when fish are contaminated, communities that depend on fishing are far more vulnerable than the general population.

There is no question that harm to fish and other wildlife from coal waste discharges is widespread and

WHY IS COAL PLANT WATER POLLUTION SO TOXIC?

Although coal waste streams contain a varying mixture of pollution, all of them are toxic. Below are summaries of some of the most dangerous poisons they contain.

ARSENIC

Arsenic is a potent poison. Power plants[32] discharge at least 79,200 pounds of arsenic every year–which the EPA calculates to be 320,000 "toxic weighted pound equivalents" (TWPE), the normalized unit that EPA uses to compare the relative toxic effects of different pollutants.[33] According to the EPA, arsenic is "frequently observed at elevated concentrations" near coal waste sites, where it has been found in groundwater, and can also build up, or "bio-accumulate," in ecosystems affected by these discharges.[34] According to the Agency for Toxic Substances Control and Disease Registry (ATSDR), arsenic in drinking water is linked to miscarriages, stillbirths, and infants with low birth weights.[35] Arsenic can also cause cancer, including skin tumors and internal organ tumors,[36] and is also connected to heart problems, nervous system disorders, and intense stomach pain.[37]

MERCURY

As the EPA explains, even though mercury concentrations in coal plant waste can be relatively low, "mercury is a highly toxic compound that represents an environmental and human health risk even in small concentrations," and the conditions at the bottom of coal waste pools are particularly likely to convert mercury into its most toxic forms.[38] Mercury is a bio-accumulating poison that impairs brain development in children and causes nervous system and kidney damage in adults.[39] A fraction of a tea-spoon of mercury can contaminate a 25-acre lake,[40] and coal plants dump 2,820 pounds — or 330,000 TWPE — into our water every year.[41] Mercury also accumulates in fish, making them unsafe to eat.[42]

SELENIUM

Coal power plants discharge 225,000 pounds of selenium each year,[43] resulting in severe environmental harm.[44] High levels of selenium can kill people, and lower levels can cause nervous system problems, brittle hair, and deformed nails.[45] Selenium may take its most serious toll in our rivers and streams, where it is acutely poisonous to fish and other aquatic life in even small doses. Concentrations below 3 micrograms per liter can kill fish,[46] and lower concentrations can leave fish deformed or sterile.[47] Selenium also bio-accumulates and interferes with fish reproduction, meaning that it can permanently destroy wildlife populations in lakes and rivers as it works its way through the ecosystem over a period of years.[48]

LEAD

Lead is a highly toxic poison that can cause severe brain damage, especially in children.[49] Coal plants dump 64,400 pounds of lead into the water each year.[50] Although the EPA reports that much of this lead settles out fairly quickly, if it winds up passing into river sediment, it will persist. Once lead enters the river ecosystem, it can enter the food chain and bio-accumulate, leading to serious harm to wildlife, as well as threatening people.[51]

CADMIUM

Cadmium is yet another bio-accumulating heavy metal.[52] Power plants send 31,900 pounds each year into our water, or 738,000 TWPE, due to cadmium's high toxicity.[53] ATSDR warns that drinking water with elevated cadmium levels can cause kidney damage, fragile bones, vomiting and diarrhea — and sometimes death.[54] Cadmium also likely causes cancer.[55] Fish exposed to excess cadmium become deformed.[56]

BORON

Boron is rare in unpolluted water, meaning that even very small concentrations can be toxic to wildlife not usually exposed to this pollutant.[57] Coal plants discharge more than 54 million pounds of boron annually, converting a rare contaminant into a common-place pollutant downstream of their discharge points.[58] Boron's effect on people is unclear, but some studies suggest that it can cause nausea, vomiting, and diarrhea, even at low concentrations.[59]

BROMIDES

Coal plant waste contains bromide salts, which are very hard to remove short of evaporating wastewater to crystallize out these pollutants.[60] Bromides interact with disinfectant processes in water treatment plants to form disinfection byproducts, including a class of chemicals called trihalomethanes, which are associated with bladder cancer.[61]

NITROGEN AND PHOSPHORUS

These nutrients are important in small quantities, but can readily overpower ecosystems in larger quantities, converting clear waters into algae-choked sumps.[62] Because coal plants dump more than 30 million pounds of nitrogen and 682,000 pounds of phosphorus annually, they are a substantial contributor to harmful nutrient loadings in the Chesapeake Bay and other watersheds.[63]

serious. Scientists have documented coal pollutants, such as selenium and arsenic, building up to "very high concentrations" in fish and wildlife exposed to coal waste discharges, and that those accumulating toxics can ultimately deform or kill animals.[69]

The more than 250 documented incidents of damage to water resources from coal plant pollution have resulted in lasting environmental harm.[70] One survey focusing on reported fish and wildlife damage caused by coal waste discharges alone shows at least 22 such incidents over the last few decades, causing damage of more than $2.3 billion.[71] Incredibly, 12 of the 22 cases were caused by *permitted* discharges, further showing the need for strong updated national standards.[72]

The same alarming story repeats itself again and again. In North Carolina, Belews Lake, a popular fishing and recreation spot, was contaminated by just over a decade of coal waste dumping. Just ten years of discharges was enough to eliminate 18 of the 20 fish species in the lake, and to leave dangerous levels of contamination in fish and birds more than ten years later.[73] In Hyco Reservoir, also in North Carolina, coal plant dumping led to an $864 million fish kill that left selenium levels in blue gill 1,000 times greater than ordinary water concentrations.[74] In Texas, at Martin Creek Reservoir, a coal plant discharged wastewater for just eight months; within two years, 90 percent of plankton-eating fish in the lake had died, and largemouth bass and bluegill could no longer reproduce.[75] Even a few years later, fish in the lake were riddled with dead or dying tissue in their internal organs.[76] Poisoned fish turned up in the Welsh Reservoir in Texas, too, forcing the state to warn against consuming fish from the lake.[77] Texas's Brandy Branch Reservoir was placed under the same advisory once it started receiving ash pond discharges.[78]

A recent survey of waters affected by nine power plants, based on intensive water sampling in North Carolina, found contamination all across the state.[79] One sampling showed concentrations of arsenic in discharges from two of the plants at levels four to nine times greater than the EPA's drinking water standards. Discharges from other plants showed selenium concentrations up to 17 times greater than the EPA's recommended chronic exposure level for aquatic life.[80] Discharges from these plants also exceeded human and aquatic life standards for antimony, cadmium, and thallium.[81] The lakes and rivers receiving this waste, predictably, showed elevated levels of toxics, including arsenic and selenium, even though they are large bodies of water. Fish in at least one of the lakes are deformed in ways that indicate selenium poisoning.[82]

Even in large lakes, coal plant pollution persists and accumulates. Researchers have discovered that arsenic, in particular, accumulates in the sediments on lake bottoms, and then erupts from sediments as water warms and stratifies in the summer, emerging back into the lake during the same summer days when many people are likely to be out fishing and swimming.[83]

These are just some of the reported incidents of damage from coal plant pollution. As the EPA has documented, the scope of this pollution is staggering. According to the EPA, two-thirds of the waterways receiving coal plant waste have reduced water quality as a direct result of that pollution.[84] Nearly half of those waterways (49 percent) have water quality worse than the EPA's National Recommended Water Quality Criteria, and a fifth of them violate standards for drinking water.[85] Standards for arsenic, selenium, cadmium, and thallium are the most frequently violated. For instance, 147 out of the 297 waterbodies receiving coal waste exceed human health water quality standards for arsenic.[86] Seventy-eight power plants discharge directly into a water body that has been formally listed as having water quality impaired by a pollutant in coal waste (with mercury being the most common pollutant of concern).[87]

The EPA estimates that 11,200 miles of rivers exceed recommended water quality levels for human health as a result of coal plant water pollution. Nearly 24,000 miles of river exceed recommended water quality levels for recreation.[88] In many of these waterways, fish are not safe to eat. Mercury in fish poses a threat to people fishing for food in nearly two-thirds of receiving waters, and 38 percent of those waters have formal fish advisories.[89]

Drinking water is affected too. The EPA reports that almost 40 percent of plants discharge within five miles of a public water intake, and 85 percent of plants discharge within five miles of a public well.[90]

Human health impacts from this pollution are serious. The EPA estimates, for instance, that nearly 140,000 people per year experience increased cancer risk due to arsenic in fish from coal plants; that nearly 13,000 children under the age of seven each year have reduced IQs because of lead in fish they eat; and that almost 2,000 children are born with lower IQs because of mercury in fish their mothers have eaten.[91]

This nationwide poisoning of our rivers is particularly unjust for communities that depend heavily on fish for food. According to the National Environmental Justice Advisory Council, families in many communities of color, including those of African-American and Native

peoples, rely on fishing to supply basic nutritional needs.[92] As the Council wrote, "[p]ut simply, communities of color, low-income communities, tribes, and other indigenous peoples *depend* on healthy aquatic ecosystems and the fish, aquatic plants, and wildlife that these ecosystems support."[93] Fishing provides an inexpensive, reliable, and healthful food source, but when fish are contaminated, reliance on fishing for food makes communities far more vulnerable to water pollution and contaminated fish than the general population.

Nutrient pollution is also a serious problem, contributing to algal blooms and other ecological imbalances across the country. For example, power plants discharge approximately 2.2 million pounds per year of nitrogen to the Chesapeake Bay – 30% of the total nitrogen load *from NPDES permitted sources discharging industrial wastewaters* in that struggling watershed, which is among the most ecologically and economically important estuaries in the country.[94]

In sum, from coast to coast, and in rivers, lakes, and streams all across the country, coal plant water pollution accumulates, poisoning waters, fouling sediment, and contributing to large-scale ecological disruption across tens of thousands of miles of waterways — nearly three decades after the Clean Water Act's target date to *eliminate* water pollution.[95]

2. EPA AND STATES FAIL TO CONTROL TOXIC DISCHARGES IN THE ABSENCE OF FEDERAL STANDARDS

New national standards are urgently needed in large part because EPA and the states have almost entirely failed to control toxic metal pollution from coal power plants. Where the EPA fails to set strong national discharge standards for polluters (as is the case here), state permitting agencies are required by the Clean Water Act to set limits in discharge permits for individual plants that reflect the best available treatment technology and protect water quality.[96] And technologies are available to significantly reduce and even eliminate toxic discharges from power plants.[97] Yet our review of 386 coal-fired power plants indicates that this law has been almost universally ignored by electric utilities and the permitting agencies that issue and enforce Clean Water Act discharge permits.

Our survey is based on the EPA's Enforcement and Compliance History Online (ECHO) database, which includes permitting information for coal power plants across the country, and our review of discharge permits. For each plant surveyed, we recorded whether the permit contained limits or monitoring requirements for six representative toxic metals (arsenic, boron, cadmium, lead, mercury, and selenium); whether the plant listed ash or scrubber waste among its discharges; whether the plant discharges into a waterway impaired for one or more of the six representative toxic metals; and whether the plant's permit was expired.[98] At least 274 of the 386 coal plants discharge coal ash and/or scrubber wastewater. *See* Appendices I–III for the complete results of our analysis. Our analysis shows that EPA and states have routinely turned a blind eye to these dangerous discharges while power plants have used our nation's waters as their own private dumping grounds.

The majority of the 274 coal plants (out of 386 reviewed) that report discharging coal ash or scrubber wastewater are not required to limit toxic metal discharges.[99] Of the 274 power plants in this review that discharge coal ash or scrubber wastewater, only 86 had at least one limit on arsenic, boron, cadmium, lead, mercury, and selenium discharges.[100] In other words, the permits for 69 percent of the plants allowed unlimited discharges of these pollutants in violation of the Clean Water Act.

COAL PLANTS WITHOUT METAL LIMITS	
Sites without a limit for at least one of the metals below	188
Arsenic	255
Boron	267
Cadmium	263
Lead	251
Mercury	235
Selenium	232

Moreover, permit limits vary by stringency and by completeness. Very few, if any, plants have protective limits for all relevant metals; most have limits for only a subset of these poisons. For example, far more plants have limits for selenium than they do for arsenic, cadmium, boron, or lead.

No state consistently issues comprehensive toxic metals limits for all plants discharging ash or scrubber waste in its jurisdiction. State permitting practices are inconsistent, and do not afford citizens a predictable or complete level of protection for all dangerous pollutants in coal waste water.

Approximately 63 percent of the power plants with coal ash and scrubber discharges surveyed are required to monitor and report discharge concentrations of toxic pollution. Monitoring and reporting requirements are critical because without monitoring data, the EPA and state agencies and downstream communities have no way of knowing the actual

STATE	NUMBER OF PERMITS REVIEWED[101]	LIMIT FOR AT LEAST ONE POLLUTANT	ARSENIC	BORON	CADMIUM	LEAD	MERCURY	SELENIUM
AL	9	5	5	0	0	0	1	0
AR	4	0	0	0	0	0	0	0
CO	3	2	0	0	1	1	0	2
DE	1	0	0	0	0	0	0	0
FL	7	7	3	0	2	5	4	4
GA	8	0	0	0	0	0	0	0
IA	15	1	0	0	0	1	0	0
IL	18	5	0	5	0	0	0	0
IN[102]	16	3	0	0	1	1	2	1
KS	5	0	0	0	0	0	0	0
KY	20	0	0	0	0	0	0	0
LA	4	3	0	0	0	3	0	0
MA	3	0	0	0	0	0	0	0
MD	6	0	0	0	0	0	0	0
MI	16	7	0	0	0	0	7	1
MN	5	2	0	0	0	0	2	0
MO	15	1	0	0	0	0	0	1
MS	3	0	0	0	0	0	0	0
MT	2	0	0	0	0	0	0	0
NC	10	5	1	1	2	2	2	2
ND	6	0	0	0	0	0	0	0
NE	5	0	0	0	0	0	0	0
NH	1	0	0	0	0	0	0	0
NJ	2	0	0	0	0	0	0	0
NM	1	0	0	0	0	0	0	0
NY	3	3	2	0	2	3	3	2
OH	18	10	0	0	0	0	8	3
OK	4	0	0	0	0	0	0	0
PA	12	8	0	1	2	6	5	7
SC	10	3	3	0	0	0	1	2
TN	8	1	1	0	0	0	0	1
TX	13	12	1	0	1	1	1	12
VA	7	0	0	0	0	0	0	0
WI	7	3	0	0	0	0	3	0
WV	5	4	3	0	0	0	0	3
WY	3	1	0	0	0	0	0	1

amount of toxics discharged into a watershed. Yet only 172 of the 274 plants were required to monitor for at least one of the metals analyzed in this report.

COAL PLANTS WITH MONITORING	
Monitoring for at least one of the metals below	172
Arsenic	97
Boron	45
Cadmium	78
Lead	81
Mercury	126
Selenium	102

Monitoring requirements vary: Although some plants are required to monitor for several toxic pollutants, consistent and careful monitoring for all relevant pollutants is a rarity. In other words, not only do many permits lack limits on the quantity of toxic metals being discharged, they fail even to require monitoring of exactly *what* and *how much* is discharged into our water, leaving communities in the dark.

Power plants discharge toxics into impaired waters without limits. Under the Clean Water Act, states must assess whether waters are "impaired" (i.e. not meeting water quality standards) and create plans to clean them up. The EPA estimates that 25 percent of surface waters that receive power plant discharges are impaired for a pollutant that is discharged by the plant.[103] And "38 percent of surface waters are under a fish advisory for a pollutant associated with [power plant wastewater]."[104] Where discharges could cause or contribute to an exceedance of water quality standards in the receiving waters, states are required to set pollution limits to prevent the exceedance.[105] The EPA has identified at least 78 plants discharging into waters impaired by coal waste pollutants.[106] Our review of 71 such power plants discharging to waters impaired for arsenic, boron, cadmium, lead, mercury, or selenium found that only twelve, or approximately 17%, had limits for at least one of the pollutants responsible for causing the impairment. It is likely that even more waters are impaired by these discharges than this survey reflects because most states do not regularly assess all waters, and the EPA ECHO database did not always list the cause of impairment.

The chart below identifies those plants discharging into waters impaired by arsenic, boron, cadmium, lead, or mercury that have at least one limit for the six pollutants. In some cases, the plant's permit restricts discharges of one pollutant, but allows unlimited discharges of the pollutant damaging water quality. For example, the permit for the Bay Shore plant in Ohio limits discharges of mercury, but the receiving water is impaired for arsenic.

DISCHARGES INTO IMPAIRED WATERS	
71 POWER PLANTS	
Limits for at least one of the metals below	18
Arsenic	3
Boron	2
Cadmium	3
Lead	5
Mercury	11
Selenium	8

Appendix III identifies power plants discharging into impaired waters.

Power plant permits are not regularly reviewed and strengthened as required by law. The Clean Water Act only allows discharge permits to be issued for a period of five years.[107] At the end of the five-year period, the discharger must submit a new application and obtain approval from the permitting agency. This requirement is meant to ensure that effluent limits are regularly reviewed to account for new advances in wastewater treatment technologies. In addition, certain plants may also need to meet more stringent limits if they are polluting waters that are not meeting water quality standards. However, the reality is that many discharge permits for power plants are "administratively" extended, which means the plant continues to discharge under the old permit for years and sometimes even decades. Our review identified 187 (out of 382[108]) coal plants operating with expired permits as of March 13, 2013.

Of the 187 plants with expired permits as of March 13, 2013, 144 are for permits that discharge coal ash and/or scrubber wastewater. Only 41 of these plants have at least one limit on arsenic, boron, cadmium, mercury, or selenium discharges; 72 percent contain no limits on these pollutants. Only 75 plants, or about 52 percent, are required to monitor and report toxic discharges of these pollutants.

COAL PLANTS WITH EXPIRED NPDES PERMITS AS OF MARCH 13, 2013		
	MONITORING	METAL LIMITS
Monitoring / limit for at least one of the metals below	75	41
Arsenic	37	9
Boron	21	6
Cadmium	25	5
Lead	33	10
Mercury	54	20

Selenium	35	16

A significant number of coal plants are operating with permits that expired five or more years ago. Specifically, fifty-three permits expired on March 13, 2008 or earlier. Of these fifty-three plants, forty-three discharge coal ash and/or scrubber wastewater. Only six of these plants had a limit for one of the six metals; 86 percent had no limits on these pollutants. Thirteen plants were required to monitor and report concentrations of discharges of at least one of the metals.

COAL PLANTS WITH EXPIRED NPDES PERMITS MORE THAN FIVE YEARS		
	MONITORING	METAL LIMITS
Monitoring / limit for at least one of the metals below	13	6
Arsenic	8	1
Boron	4	2
Cadmium	6	0
Lead	7	2
Mercury	6	2
Selenium	4	1

The administrative extension of these expired permits has serious consequences for public health and the environment. The failure to timely renew permits for power plants means that plants do not keep up with advances in wastewater treatment technologies to reduce toxic discharges. In addition, this practice effectively prohibits the public from weighing in on permits that affect their communities and watersheds—a right that the Clean Water Act guarantees.

The bottom line is that, in the absence of a binding federal backstop, EPA and the states are failing to protect the public from the toxic threat posed by coal plant water pollution; plants across the country have been allowed to pollute without limit.

3. COAL PLANTS CAN CLEAN UP THEIR WATER POLLUTION

We do not have to live with dangerous pollutants in our water. Coal plant operators have no excuse for using rivers and streams as waste dumps when the industry can readily afford to install modern pollution controls that will keep our waterways clean. The strongest regulatory options proposed by the EPA (Options 4 and 5 in its proposed rule) would compel this long overdue cleanup, though only Option 5 would result in "zero discharge" of toxic pollutants.

TIME TO STOP SETTLING FOR UNLINED "PONDS" INSTEAD OF GENUINE TREATMENT SYSTEMS

Historically, power plants have pooled their wastewater streams into massive, often unlined, pits called settling ponds that provide only rudimentary "treatment." As contaminated water is allowed to sit, some solids settle to the bottom of the ponds, but dissolved heavy metals and other harmful pollutants remain in the pond waters that are eventually discharged straight into rivers and streams.[109] Meanwhile, unlined ponds allow pollutants to leach into the water table, contaminating groundwater and the connected surface waters.[110]

Further, the structural instability of many ponds is a major hazard, as a collapse in Tennessee made tragically clear in December of 2008.[111] When the 84-acre surface impoundment at the Tennessee Valley Authority's Kingston Plant burst, it dumped more than a billion gallons of coal ash slurry into the Emory River, destroying the watershed and covering more than 300 acres of surrounding land. This spill devastated an entire community, and cleanup efforts costing more than a billion dollars have yet to fully restore the watershed in the Emory and Clinch rivers.

In its proposed rule, the EPA provides detailed analysis confirming that coal plants can make a shift away from settling ponds to better, safer, pollution controls. By transitioning to dry ash management systems and employing superior wastewater treatment technologies such as chemical precipitation, in combination with biological treatment or vapor compression, it is possible to reduce pollution from coal plants by millions of tons each year, even achieving zero liquid discharge.[112]

DRY ASH HANDLING

Much coal water pollution comes from using water to clean out bottom ash and fly ash from coal plant systems. But there is no need to use good, clean water to move this hazardous waste. Instead, simple mechanical systems can be used to move the ash. This "dry handling" technology takes plant discharges of millions or billions of gallons per year down to zero.

Dry handling of fly ash should be required to eliminate one of the most polluted wastewater streams at coal plants. In "wet" management systems, fly ash from coal combustion is transported to ash ponds using water as a sluicing agent, but it is also possible to convey the ash pneumatically, without water, to silos, where it can be loaded onto trucks or rail cars for transport to a properly constructed, lined landfill.[113] Already, 66 percent of coal and petroleum coke plants employ dry ash handling methods that eliminate all discharges,[114] and there is no reason why all plants should not employ the best dry handling methods exclusively. The conversion is readily achievable as evidenced by the fact that "power companies have converted at least 115 units at

more than 45 plants to dry fly ash handling systems since 2000."[115]

Coal plants should also be required to install dry ash management systems for their bottom ash, as approximately 22 percent of U.S. power plants burning coal, coke, and oil already are doing.[116] Bottom ash is the heavier ash that collects at the bottom the boiler and generally drops by gravity to a hopper located below the boiler. Most of the hoppers contain water for quenching hot ash. In many wet management systems, ash exiting the hopper is sluiced into ash ponds. In contrast, dry systems use a drag chain to remove bottom ash out of the boiler, dewatering the ash as it is pulled up an incline and draining the water back into the boiler. The bottom ash is then ready for transport to a landfill or commercial sale as a building material.[117]

BEST WATER TREATMENT TECHNOLOGIES FOR SCRUBBER SLUDGE AND LEACHATE

The waste from scrubber sludge and the contaminated liquids leaching out from dry ash dumps also pose significant pollution problems. Those problems, too, can be solved with demonstrated controls. These highly-contaminated waste streams are amenable to treatment with chemical precipitation in combination with biological treatment systems, which can achieve extremely high rates of pollutant removal, or in combination with vapor compression evaporation, which can achieve zero liquid discharge. These technologies are particularly important to use for scrubber sludge, because, as discussed above, so many coal plants are at last installing scrubbers to address long-standing air pollution problems.[118]

CHEMICAL PRECIPITATION: At least 40 U.S. power plants already use chemical precipitation to achieve significantly lower effluent concentrations of metals compared to what settling ponds can achieve. In a chemical precipitation system, chemicals are added to the wastewater to facilitate the settling and removal of solids.[119] However, this technology cannot effectively remove selenium, boron, or bromides, which are typically present in coal plant wastewaters in high concentrations.[120] To remove these harmful pollutants and enhance removal of mercury and other metals, additional treatment is necessary after chemical precipitation — usually biologically treatment, except for bromides, which can only be removed by vapor compression evaporation..

BIOLOGICAL TREATMENT: In a biological wastewater treatment system, microorganisms are used to consume organic contaminants, most notably dissolved forms of selenium.[121] These systems can and should be used after chemical treatment to remove remaining dangerous metal pollution. In typical systems, the bioreactor alters the form of selenium, reducing selenate and selenite to elemental selenium, which becomes enmeshed in the biomass residuals, leaving discharged wastewaters with very low concentrations of selenium.[122] The conditions in the bioreactor also can facilitate substantial removal of mercury, arsenic, and other metals.[123] The EPA estimates that at least six power plants in the U.S. are successfully utilizing biological treatment.[124]

VAPOR COMPRESSION EVAPORATION: Even combined biological/chemical treatment leaves some discharge behind, but it is possible to eliminate scrubber discharges completely. Successful evaporation systems have been installed at three coal-fired power plants in the U.S. and at four plants in Italy.[125] This type of system uses a "brine concentrator" to reduce wastewater volumes and produce a concentrated wastewater stream that can be treated in a further evaporation process. That process then yields a solid waste product that can be landfilled and a pollutant-free distilled water that can be reused within the plant or safely discharged to surface waters.[126] Using vapor compression evaporation, power plants can stop discharging pollutants in scrubber sludge altogether, including bromides, which can form dangerous disinfection byproducts when they interact with disinfectant processes in water treatment plants. And vapor compression evaporation is just one of many zero discharge options available and in use at coal plants today.

AVAILABLE TECHNOLOGIES CAN SOLVE A NATIONAL POLLUTION PROBLEM

To the EPA's great credit, it has recognized the availability of these technologies and the importance of using them to cost-effectively reduce, and perhaps completely eliminate, toxic water pollution from coal plants.

The EPA's proposed update to the 1982 standards contains several options, two of which would go a long way toward solving the problem. These two strongest options, labeled Options 4 and 5 in the proposed new rule, work to address the most toxic waste streams, including liquids contaminated by fly ash, bottom ash, scrubber sludge, and leachate from waste dumps. Importantly, only Option 5 meets the Clean Water Act's mandate to achieve zero liquid discharge, and because it appears that Option 5 is readily achievable it should be selected. Option 5 would achieve the greatest progress toward eliminating pollutant discharges by requiring dry handling of fly ash and bottom ash and requiring vapor compression evaporation for scrubber wastewaters, along with chemical treatment for leachate.[127] Only Option 5 would require

power plants to use vapor compression evaporation to control for bromides, which are known to form carcinogenic disinfection byproducts when exposed to disinfectant processes in drinking water plants, resulting in increased exposure and health risk to those drinking that water. Overall, Option 5 would eliminate nearly 5.3 billion pounds of pollution per year.[128] Option 4 would achieve lesser but still significant pollution reductions — more than 3.3 billion pounds[129] — by requiring dry ash handling and a combination of chemical precipitation and biological treatment for scrubber wastewaters.[130]

Both of these options could be achieved without putting any significant burden on the coal industry. The EPA has calculated that Option 4 controls would remove pollution at a cost of about $70 per lb.; Option 5 would cost about $111 per lb. of pollution.[131] These costs translate into far less than one percent of annual revenues for the vast majority of coal power plants and power companies; a tiny additional expense that could eliminate a huge amount of pollution.[132]

Costs to ratepayers are equally small: the EPA estimates that Option 4 would, at most, add $3.89 to the average power bill *per year* — just over a penny per day to eliminate hundreds of thousands of pounds of toxic water pollution from our water.[133] Option 5 would add $6.46 to the average annual bill — a bit less than two cents per day.

The rules would also create jobs because skilled workers are needed to install and manage water pollution controls. The EPA expects that Option 4 would create 1,253 jobs, while Option 5, which requires more work, would create 2,112 jobs.[134]

The bottom line is that there is no reason Americans should have to cope with coal plant water pollution. Installing controls will cost companies almost nothing, and perhaps cost ordinary Americans a few pennies a day. Yet, in the absence of strong leadership, coal plants have skated by for years without installing these basic protections.

4. MUDDYING THE WATERS: POLITICAL INTERFERENCE PUTS PROTECTIONS AT RISK

Although Options 4 and 5 would eliminate most toxic water pollution from coal plants, the proposed rule does not designate them as "preferred" options. Instead, the EPA's proposal includes so-called "preferred" options that would do next to nothing about scrubber sludge discharges, and which would leave other major waste streams unregulated– including large amounts of toxic fly ash and bottom ash waste.

The EPA has warned for years that the 1982 standards are not adequate to protect the public, especially because they fail to control toxic metals in scrubber sludge.[135] How could the EPA nonetheless favor such weak options? The answer is that the *EPA* did not come up with these options. The White House's Office of Management and Budget (OMB) took the highly unusual and improper step of writing new weak options into the draft rule prepared by the EPA's expert staff.

The rule that initially went to OMB basically reflected the EPA's core priorities. The EPA was looking to significantly tighten the 1982 standards because, as the EPA has stressed since at least 2009, "[s]tudies have shown that the pollutants present in discharges from coal-fired power plants can affect aquatic organisms and wildlife, resulting in lasting environmental impacts on local habitats and ecosystems."[136] The EPA long viewed regulatory updates as critical, admitting that "[t]he current regulations, which were last updated in 1982, do not adequately address the pollutants being discharged and have not kept pace with changes that have occurred in the electric power industry over the last three decades."[137]

As a result, the EPA developed two "preferred" options in *its* version of the proposal, which presented five options in all as part of its discussion.[138] Under the first, which the EPA called Option 3, scrubber sludge would be treated with combined biological and chemical treatment, and fly ash would have to be dry-handled, eliminating the discharge. Bottom ash, meanwhile, could still be handled in ponds, as could leachate from ash landfills.[139]

The second option, called Option 4, which the EPA described as the "more environmentally protective" of its preferred options, would contain all the treatment options of the first option and would also require dry handling for bottom ash as well, and require chemical treatment for leachate.[140] Thus, as the EPA explained, the two preferred options both addressed scrubber sludge and fly ash thoroughly, and differed in their handling of "bottom ash transport water and … leachate."[141] (EPA, unjustifiably, proposed not to implement the strongest possible proposed option, Option 5, which would have required zero discharge standards for scrubber sludge — though the EPA could still select that option in the final rule).

The proposed rule that emerged from OMB looked very different. OMB is meant to play a "traffic cop" role in the Administration, and is charged with coordinating administrative action, which includes reviewing agency rulemakings. Because OMB is the last stop before rules are proposed or finalized, powerful industry groups have come to see OMB review as an opportunity to

delay, weaken, or block public health protections that would impose costs on polluters.[142] Here, the power sector's lobbying was successful.

OMB review of the new coal plant water standards began in winter 2013, and carried on until just before the rule was signed by the EPA in April that same year. During that time, the proposal was dramatically weakened. A redline of the rule, showing the original EPA version and OMB's version reveals the changes: OMB refused to let the EPA choose more protective options as "preferred" regulatory paths going forward, and inserted weaker options instead.[143]

Visitor logs and other records show that industry representatives met with OMB, with the White House, and with other agencies. What is clear is that OMB — whether on its own or, more likely, at the behest of industry players — acted to weaken the proposed rule. OMB would not let the EPA select Option 4, the most protective of the EPA's preferred options, and instead inserted new, weaker, options into the rule as "preferred."[144] Suddenly, the rule had four "preferred" options — three of them the products of the OMB process.[145]

To begin with, OMB added options "3a" and "3b", which are both weaker than the EPA's original preferred option.[146] Option 3a has no limits for the scrubber sludge discharges that the EPA prepared the rule to control. Instead, it leaves those limits to the states — the same states that have failed to set permit limits for decades — for determination on a case-by-case basis.[147] Option 3b is just as bad: It would require sludge controls only for plants using scrubbers on more than 2000 MW of capacity — a group consisting of a very few enormous plants — leaving most scrubbed plants totally uncontrolled.[148] OMB's preferred options are far weaker than the EPA's. While the weaker of the EPA's original preferred options would eliminate 1.623 *billion* pounds of pollution annually, OMB's Option 3a would control just about 460 *million* pounds of pollution per year, and Option 3b would control just 914 million pounds.[149]

Options 3a and 3b are not independently analyzed in the EPA's technical supporting documents because they were not created by the EPA and are not supported by technical analysis: They are political options, created to protect industry.[150]

Having created new options that are contrary to the EPA's view of what the best technology is, OMB went on to rewrite the EPA's proposal, taking positions that are directly opposed to the expert opinions formerly expressed by EPA staff. For instance, the EPA had written, correctly, that "surface impoundments" — settling ponds — "do not represent the best available technology for controlling pollutants in [scrubber sludge]" in almost all circumstances.[151] OMB deleted this sentence, and instead announced that "EPA" was proposing options that would keep using "surface impoundments for treatment of [scrubber sludge]" — exactly the opposite of what the EPA's scientists had proposed.[152]

OMB added other language endorsing ponds[153] and parroting industry concerns about the biological treatment that the EPA had proposed in Option 4.[154] OMB added paragraph after paragraph of rationales for why Option 4 was *not* preferred, inventing "concerns" that warranted dropping that protective option.[155] None of this language was in the EPA's original proposal.

Apparently in response to this interference, the EPA did manage to salvage some of Option 4 by creating a new Option "4a," which resembles its original Option 4 in requiring bottom ash and leachate treatment, but which is weakened by exempting plants smaller than 400 MW from the requirement to treat their bottom ash waste.[156] That exemption makes a big difference: While Option 4 would control 3.3 billion pounds of pollution annually, Option 4a would control only 2.6 billion pounds, a 700 million pound difference.[157]

The result is that the EPA's original two preferred options — Option 3 and 4 — turned into *four* preferred options: Options 3a, 3b, 3, and 4a, three of them the direct result of the OMB process. All of these rules are weaker than Option 4, meaning that the proposal has shifted away from the stringent controls that the EPA has repeatedly recognized to be available and protective. If the EPA finalizes any of these lesser options (or is forced to do so by OMB), it will fail to control billions of pounds of pollution, possibly for decades to come.

The EPA can still choose to finalize the stronger standards contained in Options 4 and 5. These options would comply with the letter and spirit of the Clean Water Act, and are well-supported by the EPA's technical and scientific analysis. The damage, however, has still been done: OMB put weaker options on the table as "preferred" courses of action, and big polluters will no doubt try to persuade EPA to finalize those dangerously lax proposals. But Americans deserve better. After thirty-one years of delay, and billions upon billions of pounds of toxic pollution, the public deserves strong, national standards that protect downstream communities and are based on science — not a weak rule based on politics.

PART TWO
LIVING DOWNSTREAM: COAL WATER POLLUTION ACROSS THE COUNTRY

The hundreds of plants lacking permit limits are not just numbers: Each one puts a waterway at risk. Most Americans live, work, or play downstream from a coal-fired power plant, which means we are all at risk from the failure to control this toxic pollution, and we all can benefit from finally cleaning it up. A journey to downstream communities across the United States reveals poisoned rivers, imperiled communities, and a network of toxic waste sites that may take years to fully remediate.

1. BIG PLANTS: BIG PROBLEMS

Not surprisingly, the largest coal plants are among the worst polluters, and yet even these behemoths often lack real pollution controls.

LABADIE: LEAKS, SEEPS, AND GUSHING DISCHARGES INTO THE MISSOURI

The huge, approximately 2400 MW, **Labadie Power Station**, which sprawls across the Missouri River bottoms just upstream of St. Louis, is one of the worst water polluters in the country.

The Labadie plant, the largest coal power plant in Missouri, burns huge amounts of coal every day — so much so that it is the fourth largest greenhouse gas source in the entire country.[158] The waste from all that coal — more than half a million tons of it each year[159] — is dumped in two ponds, including a 154-acre unlined coal ash pond in use since 1970.[160] Fine alluvial soil under the pond poses little barrier to contaminants, which can make their way into nearby wells. But Ameren, the company that owns the plant, has yet to conduct comprehensive groundwater testing, and the state has not required it. The failure to conduct groundwater monitoring and testing is particularly troublesome given Ameren's history of dangerous leaks from its ash ponds just across the border in Illinois, where such testing is required. This means danger and uncertainty for residents since the rural communities around the plant depend on well water, and the Missouri River itself is a drinking water source for St. Louis residents.

Underground leaks are only the beginning of the problem, though. Amazingly, one of Labadie's ponds was allowed to leak massive streams of waste for at least nineteen years.[161] The leak spilled up to 35 gallons per minute — which works out to 50,000 gallons per day, or about 350 million gallons over the years that it went uncorrected.[162] It took action by concerned citizens, the Labadie Environmental Organization, and the Washington University law clinic to compel the company and the state into finally addressing this river of waste, at least superficially.

But even that egregious leak is not the biggest of Labadie's waste problems. The plant dumps far more waste into the river everyday than it leaks. The ash pond is allowed to directly dump waste into a trench leading to the Missouri River, and every day it dumps 25 million gallons or more, on average.[163] The plant's discharge permit was issued in 1994 and has no limits for *any* toxic metal in this discharge. In fact, it does not even require the Labadie plant to monitor for metals in its ash pond waste.[164]

That failure doesn't sit well with citizens of the area. As Christine Alt, the mother of two small children, and a life-long resident of Labadie, says, "Our family is really concerned that the leaking ash ponds and massive discharges from the ash ponds are affecting the health of family members. We have eaten fish from the Missouri River and local streams that have likely been affected by the lack of regulation."

Despite these concerns, Missouri has failed to act. The state has never updated Labadie's permit; it briefly issued a draft permit in early 2013, but then withdrew it.[165] That wasn't much of a loss: the draft permit was little better than the old one. The new permit also had *no* limits on toxic metals in the ash pond waste stream, instead requiring quarterly monitoring of boron and molybdenum, but not of arsenic, mercury, or selenium, among other toxics in coal ash.[166] To make matters worse, Ameren has proposed to build a new ash landfill in the floodplain (an area with standing water for much of the year).

Patricia Schuba, the president of the Labadie Environmental Organization, describes the threat to her family, friends, and neighbors this way:

> *"Families surrounding the Labadie Power Plant and ash dumps are afraid that decades of exposure to unmonitored coal waste dumping has increased their risks of cancer, asthma, auto-immune diseases, cardiovascular disease, neurological impairment, and premature death. Why are we dumping toxic waste in our drinking water and floodplains? Floodplains are for food production, flood protection, and, most importantly, filtering our drinking water."*

MONROE: SWIMMING IN COAL PLANT WASTE

The town of Monroe, south of Detroit, Michigan, on Lake Erie, does not really have a waterfront. Instead, DTE's **Plant Monroe** cuts the town off from the water, sitting where the River Raisin flows into the lake. Plant Monroe, at over 3200 MW, is the ninth worst greenhouse gas polluter in the country, and produces coal waste to match.[167] The plant's vast ash ponds stretch out around it, bordering the lake. Just across the river, north of the plant, Sterling State Park hosts a popular swimming beach. Many swimmers also congregate on a sandbar at the head of the plant's discharge channel itself, bathing in water flowing out of the ash ponds.

That could be a risky thing to do. Until 2010, Plant Monroe had no limits on the six toxic metals discussed in this report, meaning that those metals have flowed into the lake and its underlying sediments unchecked for decades.[168] Although the plant makes some efforts to treat its scrubber sludge, its permit requirements are extremely lax, and ash waste winds up in ponds that drain to the lake. Only in the last three years has the state of Michigan added a single limit to the permit[169] for mercury, which is an annual rolling limit, rather than a more stringent daily, or even monthly, limit. The permit does not even require monitoring for other toxic metals, including arsenic, selenium, and lead.[170]

As a result, the plant is authorized to dump 57.5 million gallons per day of wastewater contaminated by fly ash, bottom ash, and scrubber sludge into Lake Erie.[171] That water flows by the swimmers on the sandbar, and into the lake, where others play at the state park. Summer fun, in Monroe, comes along with coal plant waste.

2. COAL RIVERS: DUKE ENERGY'S TOXIC LEGACY IN NORTH CAROLINA

The largest plants are not the only serious water polluters. The combined pollution of hundreds of plants in many states also fouls our waters. North Carolina's toxic burden — caused in significant part by decades of pollution from Duke Energy power plants — demonstrates how coal pollution can make its way into river after river across the country.

Duke Energy operates ten coal-burning power plants in North Carolina. Three of the state's signature rivers, the Catawba River, the French Broad River and the Cape Fear River, are seriously affected by pollution from these coal plants and the ash ponds in their shadows. The damage extends beyond the waters in which North Carolinians swim, paddle, and fish; recent groundwater monitoring revealed that coal ash ponds are leaking at every single one of these power plants.[172]

The Catawba River runs along the western edge of the booming city of Charlotte, providing drinking water for more than 1.5 million people, stunning recreational opportunities, and habitat for abundant native species, including bald eagles, osprey, and other raptors. Unfortunately, at least three reservoirs on this river are heavily polluted by coal ash and scrubber discharges from Duke Energy power plants.

The trouble begins as the Catawba River flows from the mountains of western North Carolina into the rolling red clay hills of the piedmont. Lake Norman hosts a state park, excellent swimming and fishing opportunities, and Duke Energy's **Marshall** coal-burning plant. The four units at the nearly 2000 MW plant burn coal mined at mountaintop removal sites in Appalachia, and produce approximately eight million gallons per day of scrubber sludge and ash water in the process.[173] Duke Energy is allowed to dump this wastewater into Lake Norman with no limits on arsenic or mercury.[174] Lake Norman provides drinking water for many nearby towns, including Davidson and Mooresville, and this valuable resource is in jeopardy due to the ash pond at the Marshall plant and the daily burden of unregulated coal combustion wastewaters.[175]

Just a few miles down the Catawba River, another drinking water reservoir was long used as a pollution dumping ground for a Duke Energy coal plant. At the **Riverbend Station**, which came offline in April of 2013 after years of pollution, coal ash was pumped into two unlined ash ponds that are leaking toxic metals into Mountain Island Lake, the sole drinking water source for more than 800,000 people in the Charlotte area.[176] Although Riverbend is no longer operating, its pollution remains. Large volumes of coal ash water can still flow from these ponds into Mountain Island Lake with no limits on arsenic, selenium, or mercury. Monitoring for these metals, which might tell the public just how dangerous these discharges are, is limited to a single sample done four times a year.[177] The permit requires testing for these metals in fish tissue concentrations, but only once in the entire five-year permit term.[178] In

May 2013, the state of North Carolina brought a Clean Water Act enforcement action against Duke Energy for contamination of Mountain Island Lake caused by the seepages from its massive unlined ash ponds.[179]

Further down the Catawba River, another Duke Energy coal-burning power plant, **G.G. Allen**, is authorized to discharge an unlimited amount of coal ash wastewater into Lake Wylie.[180] The massive Allen plant has five boilers equipped with wet scrubber systems, creating a large scrubber sludge waste stream. Although the Allen plant has implemented a treatment system for the scrubber waste, the permit contains no enforceable limits on discharges of arsenic, mercury, or other coal combustion waste metals, so it is impossible to know whether this treatment system is working as intended.[181]

The Catawba River has taken enough chronic mistreatment by Duke Energy. Sadly, it is not the only river in North Carolina damaged by the coal industry.

The Cape Fear River is North Carolina's largest river basin, with impressive ecological diversity encompassing salt marshes where the river meets the Atlantic, inland blackwater swamps, and ancient cypress trees. Just a few miles upstream from the coastal estuaries that provide rich habitat for shellfish, bird life, and threatened species such as loggerhead and Atlantic green sea turtles,[182] the Duke Energy **L.V. Sutton** power plant dumps its ash waste into two unlined ponds on the banks of Sutton Lake, an impoundment of a Cape Fear tributary. Approximately 160,000 tons of coal ash is generated each year and stored in these two ponds.[183] This ash water receives no treatment other than settling before it is discharged into Sutton Lake, and the state-issued discharge permit for the Sutton plant imposes no limits on the concentration of metals that may be discharged.[184] According to the plant's own discharge monitoring reports, it discharged 603 pounds of arsenic to the river, along with 526 pounds of selenium in 2012 alone.

Fish in the Atlantic Ocean at the mouth of the Cape Fear River contain dangerous levels of mercury, and residents and tourists are warned not to consume them.[185] The river below the Sutton Plant violates water quality standards for nickel and copper, and is unsafe for harvesting aquatic life.[186] Sutton Lake, and which is required by the state to be managed as a public fishery, is a very popular sportfishing lake, especially during winter months when the water is kept warm by the plant's cooling water discharges. Unfortunately, in recent years the largemouth bass population in the lake has fluctuated wildly, and the North Carolina Wildlife Resources Commission has identified selenium contamination from the coal ash ponds as a significant contributor to that problem. Levels of selenium in fish tissue are three to five times higher than levels known to result in fish reproductive failure, and are extremely high in fish eggs and lake sediments.[187] Duke Energy has gone so far as to pump additional water into Sutton Lake from the Cape Fear River to dilute additional discharges from the ash ponds so that metals like selenium will be less likely to accumulate in fish tissues.[188]

Although Duke Energy is in the process of converting the Sutton plant to run on natural gas rather than coal, the risks posed by these coal ash ponds will persist unless the ponds are properly closed and cleaned up. Leaks from the ponds into groundwater have been thoroughly documented—the groundwater in the vicinity of the plant and the riverbed is already contaminated with arsenic, iron, boron, barium, manganese and other metals and salts.[189] Moreover, the sediments at the bottom of Sutton Lake are heavily contaminated with selenium that will continue to taint the fish population for decades to come. Simply capping the ponds and stopping discharges to Lake Sutton is far from an adequate solution. There is currently no plan for how this massive source of coal ash pollution will be cleaned up.

In the meantime, Sutton Lake and Cape Fear River bear the burden, along with nearby residents who must live with the severe health risks associated with the plant's toxic discharges. Seeking to address illegal pollution at Sutton, citizen groups initiated enforcement proceedings against Duke in June of 2013.[190]

From the Catawba to the Cape Fear, and from the ocean to the mountains, North Carolinians bear the burden of Duke Energy's waste. Their plight is not unusual.

3. RIVERS OF WASTE: WATERSHEDS IN DANGER

The rivers of North Carolina are not alone in carrying a toxic burden. Across the country, citizens are in similar straits. Many of the nation's watersheds are imperiled by water pollution from coal power plants.

THE ILLINOIS RIVER: PRAIRIE STREAM UNDER PRESSURE

The Illinois River, flowing southwest across farmland and prairie from near Chicago to the Mississippi, was once one of the healthiest rivers in the United States, supporting migrating waterfowl, and huge populations of fish and mussels.[191] Today, at least 10 coal-fired power plants dump millions of gallons per day of contaminated waste into the river and its tributaries, and the river is suffering. The state of Illinois has formally listed the river as impaired by mercury pollution, and advises its citizens to be wary of eating fish from the river.[192]

Despite these warnings, Illinois has not required coal plants to eliminate their toxic metal discharges, or even to consistently monitor them. Of the 10 coal-fired power plants on the Illinois and its tributaries, only two of them have numeric limits for boron; *none* of them have mercury limits, much less limits for arsenic, selenium, cadmium, lead, or other toxic substances found in coal ash and scrubber sludge.[193] Indeed, not all of these plants are even required to monitor their discharges for mercury, and only one of them monitors for arsenic. Most of these rogue plants are owned by just two companies: Dynegy/Ameren[194] and Midwest Generation.

Dynegy/Ameren plants on the Illinois River or its tributaries (including the Des Plaines River and the Chicago Area Waterway System) include the E.D. Edwards and Havana facilities. The Illinois River passes by Hennepin, receives discharges from the E.D. Edwards facility at Peoria, and then gets another dose of ash-contaminated water downstream at Havana. *None* of these plants have limits for their discharges of mercury and other ash contaminants.

Illinois has not put a ceiling on the volume of waste these plants can discharge, or the concentration of toxic metals in those wastes. At the upstream end, the Hennepin plant reports that it may dump as much as three million gallons of fly-ash and bottom-ash waste into the river (though there is no upper limit on how much it may discharge).[195] There are no limits on what toxic metals may be in the waste, and the company doesn't have to test for most of them. At best the facility is to monitor for mercury in a single "grab" sample from its millions of gallons of waste, once every three months.[196] The E.D. Edwards plant, next downstream, has an 89-acre, 32-foot-high unlined coal ash pond located dangerously close to the Illinois River and just upstream from recreation areas where families gather, including Pekin Lake and fishing sites along both sides of the river. That plant reports that it can discharge more than 4 million gallons per day of ash pond wastewater, containing a mixture of fly-ash and bottom ash-contaminated waste.[197] That plant was required to monitor only for mercury on a monthly basis, and only had to do that 12 times before stopping indefinitely.[198] Further downstream, the Havana plant dumps at least another 2.8 million gallons per day of ash waste from *its* ash ponds into the river even further downstream — once again without even monitoring for most metals.[199]

Midwest Generation, meanwhile, owns four plants dumping into the Illinois River and its tributaries: Upstream of the Illinois River, Midwest Generation's **Joliet 9** facility reports it can discharge close to 7 million gallons per day of ash-contaminated water[200] and the **Joliet 29** facility adds another 2.6 million gallons per day.[201] The **Will County Plant**, located on the Chicago Sanitary & Ship Canal, adds almost another million gallons per day of ash-contaminated waste.[202]

Further downstream, Midwest Generation's **Powerton** plant — near Pekin, just south of Peoria — can dump 7 million gallons per day or more of its ash-contaminated wastes into the Illinois River itself.[203] There's no telling exactly what is in that wastewater because the company is not even required to monitor for toxic metals, including arsenic and mercury, which are contained in coal ash waste.[204] Leaks from Powerton's ash ponds add to the problem: Midwest Generation's own monitoring at Powerton shows hundreds of test reports documenting leaking toxics such as arsenic and selenium that are contaminating groundwater at levels exceeding federal and state standards. In 2012, the Illinois EPA issued Notices of Violation for ground water contamination after testing of wells showed numerous exceedances of heavy metals including arsenic and selenium. Several environmental organizations such as the Sierra Club, Environmental Integrity Project, and Prairie Rivers Network filed suit over many of the same violations of groundwater standards and violations of the state's "open dumping" law[205] Incredibly, the plant sits just upstream of the Powerton Lake State Fish & Wildlife Area,[206] a state-managed reservoir that experiences heavy fishing pressure from the public despite its double use as a receptacle for cooling waters and the power plant's wastewater.

All this pollution affects people up and down the river. Joyce Blumenshine, for instance, lives near the Peoria plants, and worries about what's happening to her river.

> *"The tons of pollutants these power plants are putting in our river every year have to be stopped," she says. "Dumping pollution into our river is antiquated. I live in Peoria and half of our water supply is withdrawn from there. The public and wildlife depend on the Illinois River. There is scientific information now on how small amounts of these heavy metals can harm public health, especially for children. We need to require that these power plants stop using the Illinois River as a dump for their pollution."*

Robin Garlish, who lives near the Powerton plant in the community of Pekin, also wants to see the pollution stop. She says

> *"My family moved here to the Peoria area in 1986. It is a beautiful area with the bluffs, trails, and the Illinois River. We own a campsite along the river and have spent every summer camping and boating along the water. I have*

photographs of my son learning to waterski in the river, with the E.D. Edwards coal plant looming in the background. I never knew the millions of gallons of pollution that were being discharged into the river every single day. Where were the warning signs?"

Ms. Garlish has questions: "As spring and summer approach, I wonder if it will be safe for my family to enjoy the outdoors? Will we be able to enjoy camping and water sports on our boat without fear of pollution in the water?"

THE BLACK WARRIOR RIVER: TOXIC METALS IN ALABAMA'S WATERWAYS

Every year when the long, hot days of summer arrive in Alabama, anglers come from miles around to fish Bankhead Lake, a reservoir on the Black Warrior River near Birmingham that is known for spotted and largemouth bass. These anglers may not know that nearby, two massive Alabama Power Company power plants, **Plant Miller** and **Plant Gorgas**, are constantly pumping their coal ash refuse and scrubber sludge into huge waste lagoons next to the lake. Further downstream in Greene County, a third plant dumps even more pollution into the river. Alabama Power is allowed to dump almost unlimited amounts of toxic wastewater from its coal ash lagoons straight into Bankhead Lake, a public drinking water source for the city of Birmingham and surrounding areas. The largest of these Black Warrior River power plants, the Miller Generating Station, dumped more toxic ash into its ash pond than any other plant in the country in 2010. Waste from the Miller ash pond flows right into Bankhead Lake, contaminating the water downstream where people often go boating and fishing.[207]

The two plants that dump their wastewater into Bankhead Lake are both owned by a subsidiary of the multi-billion dollar Southern Company, but Southern has resisted any investment in cleaning up its ash pollution at these two plants. In 2010, Alabama plants dumped more dangerous heavy metals into their ash ponds than any other plants in the country: more than 14 million pounds of toxic waste.[208] The Miller plant alone was responsible for more than five million pounds of that waste, making it the biggest ash polluter in the country that year.[209] Plant Gorgas was the 15th worst out of hundreds of coal-fired power plants nationwide.[210]

Despite this pollution, the state of Alabama does not require these plants to monitor for numerous toxic heavy metals typically discharged into the Black Warrior, much less to control them. Miller ordinarily discharges at least eight million gallons per day of polluted water from its toxic ash pond into the Locust Fork of the Black Warrior, though its discharges can be much greater.[211] Its permit does not require monitoring or have discharge limitations for poisons like arsenic, mercury, and lead.[212] But even though Alabama doesn't know exactly what is in the wastewater from Miller, pollution from this power plant is having an impact. Some of those impacts are easy to see: The rocks from the water below the discharge are blanketed with a hard white gunk that cements them together.[213] Other impacts, like the toxic metals that are likely building up in the river system, are harder to see but no less real.

The same story is happening over on the Mulberry Fork, where Plant Gorgas dumps its millions of gallons of waste into a huge pond euphemistically named "Rattlesnake Lake."[214] The venom that lurks in that "lake" flows into the river, at an average volume of 20 million gallons per day. That plant does have a monthly (but not a stringent daily) limit on arsenic pollution, but lacks any limits or monitoring for selenium, mercury, lead, thallium, cadmium, or many other toxic heavy metals found in coal waste.[215]

The Black Warrior is not free from coal plant pollution further downstream, either. After leaving Bankhead Lake and passing by Tuscaloosa, the river winds through small towns and farm country where, near the town of Demopolis, Alabama Power's **Greene County** plant sits. It, too, has been among the dirtiest plants in the country based on its dumping of toxic coal ash in some years,[216] and it lacks limits on toxics other than a lenient, monthly average arsenic limit.[217]

As we discuss elsewhere in this report, metals pollution stays in rivers. It makes its way into the sediment, and then into the fish and the other creatures using the water—including the people. The Black Warrior is an Alabama treasure, flowing from the sandstone gorges of northern Alabama through the old fishing spots and reservoirs around Birmingham and Tuscaloosa, and out into the lowlands of the Gulf Coast. It's time to treat the river like the treasure it is, and keep the millions of gallons of coal ash-tainted wastewater from Alabama Power's plants out of it.

4. ENVIRONMENTAL INJUSTICE: COAL PLANT WATER POLLUTION AND INEQUALITY

Coal plants with water pollution problems are often located in communities of color and communities with lower-than-average incomes. Members of these communities are often more dependent on fishing for food than the national average, meaning that contaminated

water and fish are a particularly serious threat, according to the EPA's National Environmental Justice Advisory Council.[218] Several plants across the country illustrate this troubling national failure.

WAUKEGAN: INDUSTRIAL POLLUTION ON THE LAKE

The city of Waukegan, on the coast of Lake Michigan north of Chicago, is a working class city with a proud industrial heritage. With large Hispanic and African-American communities, Waukegan has a diverse population and an enviable location on Lake Michigan. Unfortunately, its industrial history has left it with serious pollution problems that coal-fired power is making worse.

That legacy of pollution includes a Superfund site in Waukegan's harbor due to severe PCB contamination—the residue of a manufacturing business.[219] That PCB contamination alone makes fish from certain parts of the city's lakefront unsafe to eat,[220] but it is not the only water quality problem the city faces. Another lurks just along the coast from downtown, at Midwest Generation's **Waukegan Generating Station**, an aging coal power plant whose first units began operating in the 1920s and whose current boilers are more than fifty years old.[221]

According to a recent NAACP report, the Waukegan plant is one of the worst environmental justice offenders in the nation.[222] People of color comprise 72 percent of the population within three miles of the plant, and the average income of that community is just over $16,000 per year.[223] Schools and a hospital located near the plant must contend with its pollution, which causes tens of millions of dollars' worth of public health harm every year.[224]

The Waukegan power plant's ash ponds sit just off the shoreline of the lake, and are responsible for serious groundwater contamination. According to the state, "[g]roundwater flow" is "highly dependent on the water level in the ash ponds," meaning that contaminants from the ponds appear to be flowing into the groundwater.[225] In 2012, the Illinois Environmental Protection Agency issued the plant a Notice of Violation for violations of arsenic, boron, manganese, iron, sulfate, chloride, total dissolved solids, pH, and antimony standards in groundwater near the ponds, concluding that the violations had been caused by waste leaking from the ash ponds.[226] Several environmental organizations such as the Sierra Club, Environmental Integrity Project, and Prairie Rivers Network filed suit over many of the same violations of groundwater standards and violations of the state's "open dumping" law.[227]

Yet, even as the state of Illinois begins to address leaks in the ash ponds, it continues to allow contaminated water in those ponds to flow directly into Lake Michigan. Waukegan's discharge permit, which is more than a decade old, sets only copper and iron limits for the 3.2 million gallons per day of ash-contaminated waste which Waukegan is authorized to discharge, failing to set any limits for poisons like arsenic, mercury, and selenium.[228] A more recent draft permit, issued for public comment in late 2013 repeats this mistake, again setting no limits on the toxic heavy metals in Waukegan's ash waste stream.[229] Yet the plant is clearly a large water pollution source: Waukegan reported to the EPA that it discharged more than 1,000 pounds of chemicals listed on the Toxic Release Inventory into surface waters near the plant ever year between 2002 and 2010.[230] Because Waukegan is not even required to monitor toxic metal discharges, actual figures may be higher.

This water pollution is only part of the plant's toxic legacy. The plant emitted more than 11,000 tons per year of asthma-causing sulfur dioxide (SO2) between 2007 and 2010, and has yet to clean up its air pollution. Midwest Generation has said it will clean up this pollution, but even that may not be good news for the people of Waukegan. For one thing, the company will likely use "Dry Sorbent Injection" to address SO2 pollution, a technology whose waste can greatly increase the solubility and mobility of toxics in coal ash, including arsenic and selenium.[231] If that waste winds up in Waukegan's ash, the plant's discharges will be all the more potent.

NORTH OMAHA & RIVER ROUGE: VULNERABLE COMMUNITIES AND LAX PERMITS

Other power plants on the NAACP's worst offenders list follow this dangerous pattern of neglect, including the **North Omaha** plant in Nebraska and the **River Rouge** plant in Michigan. Although these plants may opt to ship their ash elsewhere (where it may harm other communities), their permits continue to allow direct discharges into nearby waterways. There is no reason these permits should allow unchecked dumping.

The **North Omaha** power plant, on the NAACP's list of the worst environmental justice offenders,[232] is located in a predominantly African-American community with an asthma rate of 20 percent. It is an old, poorly-regulated facility, with some parts of the plant dating back to the 1950s.[233] The plant emits more than 300 pounds of mercury each year. Of the 51 coal plants located in cities the size of Omaha or bigger, the North Omaha plant is the single biggest mercury emitter.[234]

The plant's legacy of air pollution, asthma, and mercury poisoning is compounded by serious permitting failures with regard to water pollution. Although the plant's owner, the Omaha Public Power District, says it now sends its ash off-site for dry storage, the state's water permit for the plant allows it to send water from its bottom ash and coal pile runoff ponds straight into the Missouri River, not far from the city's water intakes.[235] The plant is only required to monitor for toxic substances, including mercury and arsenic, once a year.[236] There are no limits on how much of these toxic metals it can discharge.[237]

Nebraska does not need more water pollution. Already, 73 waterbodies in Nebraska are already so contaminated with mercury that the state has warned people about eating fish from them.[238] The non-profit Environmental Working Group has already rated Omaha's drinking water as among the worst in the country, based on its chemical content and safety.[239] Any bottom ash waste from the North Omaha plant will only add to these problems. There is no reason to continue to allow the plant to dispose of *any* ash-contaminated wastewater in the Missouri River.

DTE's **River Rouge Plant**, on the Detroit River, also has an unduly lax permit. The plant is one of many huge industrial facilities — from oil refineries to steel plants — that dot the banks in River Rouge near Detroit. The cumulative pollution from all these facilities fouls the air and water for many communities along the river. The River Rouge Plant, though, stands out as a particularly serious pollution source in its own right.

The smokestacks of the River Rouge plant rise directly behind a playground, on the banks of the river. Two-thirds of people living near the plant are minorities, and their income is barely above half of the average income in Michigan.[240] Over 1.6 million pounds of hazardous chemicals are released in the River Rouge community every year by the many heavy industrial facilities there.[241]

Water pollution from the plant could add to this burden, thanks to a weak permit. The River Rouge Plant is authorized to discharge more than 654 million gallons per day of wastewater into the river.[242] The permit lists "treated bottom ash transport water" and "treated coal pile runoff" as constituents of this wastewater flow — though it is not clear how much of this pollution is in the wastewater, and there are no limits and no monitoring required for arsenic, selenium, mercury, boron, or other constituents of ash waste.[243]

Although some large portion of the ash may be taken offsite and dumped elsewhere, this permissive permit is yet another danger for residents of the River Rouge. Indeed, according to the Detroit Riverkeeper,[244] at least some of this bottom ash is not travelling far: It is being dumped next to the river not far south of the River Rouge at another DTE Energy plant, Trenton Channel.

Many citizens of the River Rouge community and surrounding towns fish the Detroit River.[245] People of color go fishing more often, according to a University of Michigan study, and they are more likely to take fish home for food.[246] Not all of these fish are safe to eat: The state of Michigan warns against eating sturgeon and freshwater drum because of mercury contamination, for instance, and has issued a blanket warning against eating most other fish in the river.[247]

The bottom line is that coal waste has no place anywhere near the water people depend upon, and regulators need to make sure that these power plants can never release their waste into the public's waterways. River Rouge's and North Omaha's dangerously lax permits, and the ongoing pollution from the Waukegan plant, are just one more injustice in communities already overburdened with environmental threats.

5. TRANSFERRING POLLUTANTS FROM AIR TO WATER

Without new water pollution protections, efforts to clean the air will transfer air pollutants into the water as scrubber sludge.

Nobody should be asked to make a tradeoff between clean air and clean water. Technologies exist that enable coal plants to reduce the amount of metals in their scrubber waste streams and eliminate all discharges of this waste stream to surface water,[248] but very few plants currently use these systems. Instead they discharge scrubber wastewater to rivers and lakes after the most minimal treatment. Scrubbed plants in Pennsylvania and North Carolina illustrate the magnitude of the problem.

A prime example of the risks posed to the nation's waters by uncontrolled discharge of wet scrubber wastewater is the **Bruce Mansfield** plant in Shippingport, Pennsylvania. This massive 2740 MW plant, operated by FirstEnergy, has three boilers equipped with wet scrubbers to reduce sulfur dioxide air pollution, and a wet handling system for bottom ash and fly ash. For many years, FirstEnergy has sent all of the scrubber wastewater and ash handling water through a seven-mile pipeline to the Little Blue Run Coal Ash Impoundment — the largest unlined ash pond in the United States.[249] In 2011, FirstEnergy dumped 79,500 pounds of arsenic and 26,190 pounds of selenium into that impoundment.[250] These pollutants and other

toxic metals such as boron and molybdenum are then dumped into Little Blue Run Stream and Mill Creek, ultimately making their way to the Ohio River. Pennsylvania regulators have identified Little Blue Run, Mill Creek and stretches of the Ohio River as waterways that are not safe for aquatic life due to siltation, pH and metals.[251] Pennsylvania officials have advised community members to limit their consumption of fish caught in the Ohio River, in part due to concerns about heightened levels of mercury.[252]

The Bruce Mansfield plant operates under an expired NPDES permit that imposes no discharge limits or monitoring requirements for any of these metals where water enters Little Blue Run Stream and Mill Creek.[253] FirstEnergy's own monitoring reports reveal concentrations of boron at the Little Blue Run Stream surface water monitoring station location immediately downstream of the impoundment discharge (SW-3) higher than the chronic Pennsylvania water quality criterion for boron in all quarters between 2006 and 2012.[254] During this same time period, concentrations of boron even exceeded the acute Pennsylvania water quality criterion for boron at SW-3 in 9 of 22 quarters.[255] And in the one quarter of available data for selenium from SW-3 in the last five years, selenium exceeded the chronic Pennsylvania water quality criterion.[256] Notably, FirstEnergy is not required to monitor for all coal ash and scrubber sludge pollution at this monitoring location.

Outraged by the water contamination at Little Blue Run, the community organized to fight an expansion of the disposal site and filed a lawsuit under the Clean Water Act. In response, Pennsylvania regulators have required closure of the leaking impoundment by 2016 and some cleanup of seeps and groundwater. FirstEnergy now plans to transport coal ash and scrubber wastewater nearly 100 miles upriver on thousands of uncovered barges per year to another unlined, active coal ash dumpsite in LaBelle, Pennsylvania.[257] LaBelle's groundwater and surface water are already contaminated by leaks from this coal ash dump, and because many of the working class residents of that town hunt for food, they are also exposed to bio-accumulating metals such as selenium through what they eat.[258]

The incredible volume and toxicity of wastewater generated by the scrubbers at the Bruce Mansfield plant demands close scrutiny and careful handling, but Pennsylvania permitting authorities have not imposed any limits or required any kind of effective treatment to protect the Ohio. Shifting the problem to a different community upriver is no solution.

Another plant that already barges its coal ash waste to LaBelle is the 50-year old **Mitchell Power Station** near New Eagle, Pennsylvania. In July 2013 FirstEnergy announced plants to retire the Mitchell plant, but the facility has been polluting local waterways for decades. The Mitchell plant has a wet scrubber system and discharges scrubber wastewater into the Monongahela River several miles upstream from the intake for the Pennsylvania-American Water Company. The "Mon," as it is affectionately known by thousands of residents along its length, flows out of the mountains of West Virginia and joins the Ohio River in Pittsburgh. This river is the heart of southwestern Pennsylvania, the engine of the region's economic growth for hundreds of years, and the source of drinking water for more than 800,000 people. Sadly, a legacy of abandoned mines and uncontrolled industrial discharges means that for most of the river's length, water quality is not safe for drinking and recreation.[259]

The Mitchell plant's water discharge permit expired in 1996 — nearly 20 years ago. It is perhaps not surprising then, that this permit utterly fails to protect the Monongahela from the toxic wastewater produced by the Mitchell plant and its wet scrubber system. The outfall that sends the plant's scrubber wastewater into the Monongahela has no limits on metals commonly found in coal combustion wastes, nor any monitoring requirements.[260] Another outfall at the Mitchell plant dumps leachate from an ash landfill into Peters Creek, a tributary of the Monongahela. While the Mitchell plant's expired permit requires monitoring of boron and aluminum discharges, the permit imposes no limit on the amount of these metals that can be discharged into Peters Creek.[261] The EPA's proposed rule finalized in its strongest form would require the operator to significantly reduce metals concentrations in this discharge stream rather than merely monitor those pollutants.

The approximately 400 MW **Asheville** plant, on North Carolina's French Broad River, provides a test case for how a wet scrubber system increases the toxicity of a coal plant's wastewater discharges. In 2005 and 2006, Duke Energy added wet scrubbers to the two units at the Asheville plant for sulfur dioxide control. The wastewater from the scrubbers is treated in an onsite artificial wetland, and then sent to a holding pond where it is mixed with fly ash and bottom ash handling waters. The wastewater permit allows the Asheville plant to dump from this holding pond into the French Broad River with no limits on the metals commonly found in scrubber sludge and coal ash wastewaters,

other than mercury.[262] According to the plant's own reporting, it discharged 324 pounds of arsenic and 564 pounds of selenium in 2012.[263]

The only way to understand how well the artificial wetland treatment system is working is a monitoring program of toxic metals where the ash pond dumps into the French Broad—just a single sample taken once a month.[264] In fact, the water pollution problem at Asheville has significantly worsened since the scrubbers were added. A study done by scientists at Duke University compared pollutant load in the ash pond discharge at Asheville before and after the wet scrubbers began operating, and found that the amount of pollutants such as arsenic and selenium discharged to the French Broad River dramatically increased after the scrubbers were installed.[265] The study reported that samples collected during the summer of 2011 from mingled scrubber and coal ash waste flowing to the French Broad River contained arsenic at levels four times higher than the EPA drinking water standard, and selenium levels 17 times higher the agency's standard for aquatic life. Cadmium, antimony, and thallium were also detected in the wastewaters at levels above human and aquatic life benchmarks.[266]

Clearly, more must be done to reduce pollution from the Asheville scrubber system. The EPA has identified treatment methods that can eliminate or at least achieve much lower levels of toxic metals from scrubber waste streams, and must apply them to all coal-burning plants with scrubber systems, including relatively small plants like Asheville that have an outsized impact on a treasured river.

These plants are just examples: All across the country, scrubbers are going in and increased water pollution follows, without efforts to tighten permit limits. Smokestack scrubbers are good news for the air, and they can be good news for the water, too, if the EPA puts strong controls in place for treatment of this waste. No community should have its watershed contaminated by the same pollution that it once was forced to breathe.

6. POLLUTING WATER IN THE ARID WEST

The crisis of groundwater and surface water contamination by uncontrolled discharges of toxic metals is not limited to the wetter eastern half of our country. The waters of the western United States are also burdened by these toxic discharges, which is all the more troubling considering the scarcity of water in the region and the rapidly growing population. Plants in Colorado and Montana illustrate the problem of coal water pollution in the West.

The Xcel **Comanche** plant in Pueblo, Colorado, has three large coal-burning boilers. Two of these boilers were built in the 1970s, and the third was built in 2010. All of the boilers burn coal brought in from massive strip mines in Wyoming, producing more than 300,000 tons of coal ash in a single year.[267] The plant uses a wet ash handling system to collect fly ash and bottom ash and then moves this coal ash water through a series of three settling ponds.[268] Despite evidence that ash handling water contains significant amounts of toxic metals and solids, there are no limits on any of these metals in the wastewater discharged into the small St. Charles River.[269] The lack of limits on selenium discharges is even more appalling considering that the St. Charles is impaired for selenium, meaning that the river is not meeting water quality standards for this pollutant.[270] Within a few miles of the Comanche plant, the St. Charles flows into the Arkansas River, and that portion of the Arkansas River is also failing to meet water quality standards for selenium and sulfates.[271]

The water discharge permit for the Comanche plant requires monitoring for some metals at the main ash outfall, but imposes no limits on the concentrations of those metals in the discharge.[272] While monitoring is an important first step, uncontrolled discharge of these metals into an impaired stream is dangerous and contrary to the Clean Water Act. Once a waterbody is designated as impaired, the state must determine the "total maximum daily load" (TMDL) of the particular pollutant that the waterbody is able to absorb and still comply with water quality standards. However, the state of Colorado has not yet developed a TMDL for selenium in the St. Charles River or in the Arkansas River downstream of the confluence with the St. Charles, and is allowing the Comanche plant to discharge coal ash wastewaters into this impaired river with no limits at all on selenium.

The Arkansas River is a major fly-fishing destination in Colorado, and a source of tourism income and recreation for area residents. Because high levels of selenium severely impairs reproduction in fish, selenium limits must be imposed on major sources like Comanche so that the St. Charles and Arkansas Rivers can continue to support abundant fish populations. Moreover, water resources in this part of Colorado are incredibly precious, especially considering the exceptional drought the area is now experiencing. These rivers should be treated like the indispensable resources they are.

Another prime fishing destination, the Yellowstone River in Montana, is also threatened by coal ash discharges. The Yellowstone runs for more than 500

miles through the heart of the state, providing drinking water for its cities, irrigation for farms, and superior fishing opportunities. As the river approaches Billings, it flattens out, warms up, and provides excellent warm-water angling for walleye, northern pike, and catfish. Indeed, a large stretch of the river downstream of the **J.E. Corette** plant is classified as a blue ribbon stream for fishing. This stretch of the Yellowstone River brings substantial tourism revenue to the region through duck- and goose-hunting outfitters and trips to Pompey's Pillar National Monument, a sandstone bluff on the banks of the river bearing the engraved signature of Captain William Clark, of the Lewis and Clark expedition.

Unfortunately, the Yellowstone is contaminated by ash pond discharges from the Corette power plant, operated by Pennsylvania Power & Light's Montana subsidiary, PPL Montana. The Corette plant burns a rail train car full of Wyoming coal every hour,[273] producing approximately 32,000 tons of bottom ash each year, containing 38 tons of heavy metals.[274] The bottom ash water is stored onsite in ponds before being discharged to the Yellowstone without any limits on any toxics or metals that may be contained in that bottom ash water. The Montana Pollutant Discharge Elimination System permit — which is eight years overdue for renewal — imposes limits only on oil and grease, and total suspended solids.[275]

The Montana Department of Environmental Quality has assessed the Yellowstone River upstream and downstream of the Corette plant. This entire section of the Yellowstone has been deemed not suitable for aquatic life and primary contact recreation, such as swimming.[276] Below the Corette plant, the river does not meet water quality standards for arsenic, rendering the river unsuitable as a drinking water supply. Although Montana DEQ attributes the arsenic impairment to natural causes, the section of the river that is impaired begins right around the Corette plant,[277] which is releasing untreated bottom ash wastewater — known to contain arsenic — directly into the river.

The Yellowstone River provides drinking water and irrigation supply for millions of acres of farmland downstream of Billings. Contamination of the river with arsenic and other coal ash constituents increases treatment costs for drinking water, and degrades one of Montana's most treasured resources.

7. TVA'S TOXIC LEGACY: THE ASH POND CLEAN-UP PROBLEM

Hundreds of coal waste ponds, holding millions of pounds of toxic ash and scrubber sludge, dot the country, posing a real and present danger to public health.[278] Over a hundred of these sites have been shown to have damaged groundwater resources, and this known damage is probably just the tip of the iceberg.[279] The EPA's proposed coal water pollution rules could, if finalized in their strongest form, stop companies from dumping any more waste into these ponds. But even if they do, the ponds themselves will remain an ever-present threat to communities across America. The EPA can and should begin to fix this problem by stopping continuing use of the ponds, but waste rules, focused on pond closure, will ultimately be needed to solve it.

Nowhere is this pressing problem clearer than among the plants of the Tennessee Valley Authority (TVA). TVA has continued to use aging ponds throughout its system despite causing the biggest coal ash spill in U.S. history in December 2008, when a dredge cell at its ash pond complex at TVA's **Kingston**, Tennessee, plant failed, spilling roughly 5.4 million cubic yards of ash into the Emory River and burying 26 homes.[280] According to TVA's own Inspector General, TVA might have been able to prevent the spill had it heeded decades of warning about the pond's stability.[281] A federal court recently held TVA liable for its careless failure to protect the public.[282] Recovery at Kingston slowly continues, with formal cleanup activities recently concluding, but the waters around the plant remain contaminated, with ash remaining in sediment at the river bottom.

One might think TVA and the state regulators watching over its plants would have learned from this experience. But change has been slow in coming. Incredibly, the State of Tennessee continues to allow TVA to discharge waste from Kingston to the river without any permit limits for dangerous metals in the ash and scrubber sludge at the site.[283]

This cavalier attitude toward coal ash is the rule, not the exception. The TVA Inspector General reports that TVA's internal culture was "resistant to treating ash management as much more than taking out the garbage," failing to treat it like the hazardous waste that it really is.[284] State regulators have been just as lax. Although independent structural engineers have found substantial seeps and leaks at the majority of TVA's remaining ash ponds,[285] TVA has not closed its ponds, and state regulators continue to allow the ponds

to dump their wastes into rivers through *permitted* discharges.

These plants include TVA's **Colbert** facility in northern Alabama, where bright orange, toxic-filled, leaks from the ash ponds are flowing into a tributary of the Tennessee River, prompting concerned citizens to start legal proceedings against TVA for its carelessness.[286] In addition to its unpermitted leaks, Colbert is actually authorized by the state of Alabama to dump ash pond waste through a pipe right into a stream, with no limits on heavy metals.[287] Another *permitted* wastewater outfall discharges into the Tennessee River within about fifty feet of a county drinking water intake. (Although TVA has recently indicated that it will remove Colbert from service in 2016, those discharges may continue for years afterwards, unless TVA properly closes the plant's dangerous ash ponds.)

Permitted dumping is going on throughout the TVA system, including at TVA's **Gallatin Plant**, which is just upriver of Nashville and discharges wastes from its ponds into a popular reservoir, Old Hickory Lake.[288] TVA's **Shawnee Plant** sends nearly 20 million gallons per day of ash-fouled water into the Ohio River near Paducah, Kentucky, without limits on any toxic heavy metal.[289] The **Allen Plant** in Memphis disposes of some ash offsite, but is still authorized to send its millions of gallons of ash ponds waste into the Mississippi River, again with no permit limits on toxic metals.[290] Discharge reports from many other TVA plants show levels of mercury and selenium, among other poisons, well above water quality standards.[291]

These permitted discharges need to stop, and the EPA's Clean Water Act rules can stop them. But even if they do, TVA's ash ponds may remain behind — leaking, seeping sources of continuing groundwater and surface water pollution. Gallatin's ponds, for instance, were constructed directly on top of a landscape dotted with sinkholes. Although TVA has filled some of them, a new sinkhole opened up as recently as 2010, and the entire pond complex continues to sit on fragile terrain and has developed stability problems in its containment walls.[292] In fact, TVA itself reported that by the late 1980s, it had identified as many as 111 sinkholes beneath Gallatin's active ash ponds — a terrain so filled with holes that it was hard to keep the pond from draining into them.[293] Several sinkholes have also opened over the years at the Colbert facility, and independent engineers have determined that some of its containing walls should be repaired to prevent them from collapsing.[294]

Many other TVA ash ponds sit on similarly dangerous ground. Some TVA facilities continue to leach and leak even long after closure. At the Allen plant, TVA acknowledges that leaks from its ash facilities have contaminated groundwater wells along the shore of nearby Lake McKellar.[295] That problem arises in part from a long-closed, now mostly dry pond which TVA maintains is still covered by a discharge permit — which means, under Tennessee's interpretation of its waste laws, that TVA need not ever show that the drying ash dump complies with the state's landfill safety standards.[296] The result is that both the "closed" pond and the active ponds continue to contaminate water supplies, without meaningful controls under either waste or rules.

Other TVA facilities are even more precarious: its soon-to-close **Johnsonville** plant, for instance, dumps its ash on an artificial "Ash Island" in the middle of the Tennessee River, ringed by unstable dikes — a situation so unacceptable that TVA has prioritized the site for cleanup to avert a potential Kingston-like disaster.[297] Even without a spill, contaminated ash water leaches straight into the river from the ponds, and will keep doing so even if the ponds are closed.[298] There, and throughout the system, ash ponds raise serious public safety concerns.

TVA has said that it intends to close its ponds sometime in the next decade and is already working toward that goal at some plants. But TVA officials said the same thing more than twenty years ago and failed to take action — leaving open the Kingston pond that eventually collapsed and spilled into the Emory River.[299] Because there are not strong federal standards for waste handling, and TVA's closure plans haven't been submitted to the public for comment and review, it's far from clear that pond closures will be safe and secure, or that they will happen quickly, to protect the public. The water pollution standards will help dry these huge waste sites up, but there's more work to do to clean them up permanently.

8. COAL IN THE WATER, COAST TO COAST

These stories of contaminated rivers and fouled beaches, leaky waste sites and permitted poisonings, are just a small sample of the national coal plant water pollution problem that decades of state and federal neglect and industry callousness have caused. No community should have to worry about the safety of its water or the health of its river. That is the guarantee that Congress set out in the Clean Water Act, but that promise has long been deferred. For the sake of

the hundreds of thousands of Americans who suffer because of that indefensible delay, it is time, now, for the EPA to at last clean up this toxic industry.

CONCLUSION

Clean water is a basic human right. We all deserve safe water to drink, clean lakes and rivers to boat and play in, flourishing watersheds, and healthy fish to eat. For too long, the coal industry has polluted our precious waters with impunity. For 31 years, state regulators and the EPA have mostly looked the other way, allowing toxic dumping to continue even though it could have been cleaned up years ago. Decades of pollution and thousands of miles of damaged waterways are the result.

It's time to put this dark history behind us. There is no reason to tolerate continued dumping, and the Clean Water Act mandates cleanup. We can eliminate most, if not all coal plant water pollution for pennies a day. The strongest of the EPA's proposed options will get us to that future. But it won't happen unless ordinary people demand controls to clean up these dangerous discharges from the president and the EPA. Industry lobbyists seek to weaken the basic protections that the EPA has proposed, and the industry lobby is well-funded and well-connected. But industry's voice is not louder than that of the millions of Americans who have a right to clean water. It's time for all of us to stand up and be heard.

ENDNOTES

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2 EA 3-34, 3-38.

3 33 U.S.C. § 1314(b); 40 C.F.R. §§ 122.44(a)(1), 123.25, 125.3.

4 78 Fed. Reg. at 34,512.

5 EA 3-34, 3-38.

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7 *See, e.g.*, EPA, T*echnical Development Document for the Proposed Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* (April 2013) [hereinafter, TDD]

8 *Id.* at 7-4–7-16.

9 *Id.* at 7-26–7-29; 7-36–7-38.

10 EPA, *Benefit and Cost Analysis for the Proposed Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* 12-2 (April 2013) [hereinafter, BCA].

11 *See* 78 Fed. Reg. at 34, 501, table Xi-9 (noting that the average annual cost to ratepayers for the most stringent option is $6.46).

12 EA at 3-13.

13 *See id.* at 3-14 (total toxic-weighted pollution from steam electric power plants is 8.3 million TWPE; total pollution from remaining top ten industries is 5.78 million TWPE).

14 *Id.*

15 *See id.* at 5-7 – 5-17.

16 *See infra*.

17 33 U.S.C. § 1251(a)(1).

18 *See* 78 Fed. Reg. 34,432, 34,435 (June 7, 2013).

19 *Id.*

20 EPA, *Steam Electric Power Generating Point Source Category: Final Detailed Study Report* (2009) at 1-2, 4-26, 6-11 ("Coal combustion wastewater is commonly discharged directly to surface waters following treatment in settling ponds.") [hereinafter "2009 Study"].

21 BCA at 12-2.

22 78 Fed Reg. at 34,501, Table Xi-9 (total average annual cost to ratepayers for the most stringent option is $6.46)

23 *See* EA at 3-13, Table 3-2.

24 EA at 3-13, Table 3-2, 3-20 – 3-21.

25 *Id.* at 5-6, 5-7.

26 TDD at 6-6, Table 6-3.

27 *See id.* at 4-33.

28 *Id.* at 6-11.

29 *Id.* at 6-8, 6-11; see *also* 75 Fed. Reg. at 35,150.

30 *See* TDD at 7-22 – 7-41.

31 78 Fed. Reg. at 34,512.

32 EPA figure are for power plants generally, regardless of fuel, but coal power plants are by far the principal source of the toxics we discuss.

33 EA at 3-13.

34 2009 Study at 6-5.

35 ATSDR, *Toxicological Profile for Arsenic*, at 18.

36 *Id.*

37 *Id.* at 20-22.

38 2009 Study at 6-5.

39 *See* ATSDR, *Public Health Statement: Mercury* at §§ 1.5-1.6.

40 Union of Concerned Scientists, *Environmental Impacts of Coal Production: Air Pollution*, available at: http://www.ucsusa.org/clean_energy/coalvswind/c02c.html

41 EA at 3-13.

42 *See* ATSDR, *Public Health Statement: Mercury* at § 1.2.

43 EA at 3-13.

44 2009 Study at 6-4.

45 *See* ATSDR, *Public Health Statement: Selenium* at § 1.5.

46 2009 Study at 6-4.

47 *See* A. Dennis Lemly, *Selenium Impacts on Fish: An Insidious Time Bomb*, 5 Human and Ecological Risk Assessment 1139 at 5 (1999).

48 *See generally id.*

49 *Id.*

50 *Id.* at 3-13.

51 *Id.* at 3-8.

52 EA at 3-7.

53 *Id.* at 3-13.

54 ATSDR, *Public Health statement: Cadmium* at 5.

55 *Id.*

56 EA at 3-8.

57 *Id.* at 3-8 – 3-9.

58 *See id.* at 3-13.

59 *See id.*

60 *See* 78 Fed. Reg. at 34,477.

61 *Id.* 34,505.

62 *See* EA at 3-9 – 3-10.

63 *Id.* at 3-10.

64 *Id.*at 3-13.

65 *Id.* at 3-14.

66 *Id.*

67 *Id.* at 3-15 – 3-16.

68 *See id.*3-16 -3-17.

69 *See* Christopher Rowe *et al.*, *Ecotoxicological Implications of Aquatic Disposal of Coal Combustion Residues in the United States: A Review*, 80 Env. Monitoring and Assessment 207 (2002) at 215,231-236.

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74 Rowe *et al.* at 231.

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76 Rowe *et al.* at 241.

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84 EA at 5-8,

85 *Id.* at 5-9.

86 *Id.* at 5-8.

87 *Id.* at 6-36.

88 EA at Table 6-15.

89 EA at 6-22; 78 Fed. Reg. at 34,505.

90 EA at 3-33.

91 BCA at 3-6 – 3-14.

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93 *Id.* at 2.

94 *See* EA at 3-20.

95 *See* 33 U.S.C. § 1241(a)(1)

96 33 U.S.C. § 1314(b); 40 C.F.R. §§ 122.44(a)(1), 123.25, 125.3.

97 *See* section III, *infra*; 2009 Report at 4-50.

98 We provide a more complete description of our methodology in Appendix I. Appendix II reports the main results themselves.

99 EPA states that "[t]here are 277 plants that generate and discharge FGD wastewater, fly ash transport water, bottom ash transport water, and/or combustion residual landfill leachate based on responses to the Questionnaire for the Steam Electric Power Generating Effluent Guidelines." RIA, at 3-4 n. 39.

100 We have not determined whether the limits that do exist have been set to reflect best available technology or to protect water quality in individual cases. However, because essentially all of the permits allow continued discharge of effluent contaminated by ash or scrubber waste, it is clear that states are not setting the zero discharge limits which the best technology allows.

101 Counts include only permits listing ash or scrubber waste discharges.

102 Two additional Indiana plants have metals limits which take effect in 2015. We have not included those limits in this count of currently applicably limits, but they demonstrate that states can and should set such limits going forward.

103 78 Fed. Reg. at 34,505.

104 *Id.*

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106 EA at 6-36.

107 33 U.S.C. § 1342(b)(1)(B).

108 Several plant information summaries in the ECHO database did not identify a permit expiration date.

109 78 Fed. Reg. at 34,459.

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111 78 Fed. Reg. at 34,441; *see also id.* at 34,516 (monetizing the annual benefits of reduced impoundment failures under Option 4 at $295.1 million).

112 This technology review is by no means exclusive. Many other technologies exist which can help reduce or eliminate coal plant discharges.

113 78 Fed. Reg. at 34,439; TDD at 4-19-4-23.

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123 78 Fed. Reg. at 34,460.

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127 78 Fed. Reg. at 34,458 (Table VIII-1).

128 *Id.* at 34,485-34,486 (Table IX-4).

129 *Id.*

130 78 Fed. Reg. at 34,458 (Table VIII-1).

131 *Id.* at 34,504 (Table XII-1).

132 *See id.* at 34,494 (Table IX-4).

133 *Id.* at 34,501 (Table XI-9).

134 *Id.* at 34,503 (Table XI-11).

135 *See, e.g.*, Memorandum from James Hanlon, EPA, Director of the Office of Wastewater Management to EPA Water Division Directors, Regions 1-10 & Attachment A: Technology Based Effluent Limits, Flue Gas Desulfurization (FGD) at Steam Electric Facilities (June 7, 2010) (explaining that EPA is conducting a rulemaking to "address" this wastestream and that current controls are not adequate); 74 Fed. Reg. 55,837, 55,839 (Oct. 29, 2009).

136 74 Fed. Reg. at 55,839.

137 *Id.*

138 *See* Redline at 15.

139 78 Fed. Reg. at 34,458.

140 *Id.*

141 Redline at 186.

142 *See, e.g.*, Lisa Heinzerling, *Who Will Run the EPA?*, 30 Yale Journal on Regulation 39 (2013), available at: http://jreg.commons.yale.edu/who-will-run-the-epa/.

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146 *See id.*

147 78 Fed. Reg. at 34,458.

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149 78 Fed. Reg. at 34,485, Table IX-4.

150 *See, e.g.*, Redline at 338-39.

151 Redline at 137.

152 *See id.*

153 Redline at 144.

154 *Id.* at 226-27; *see also* Redline at 278-80 (OMB drafted section inviting further criticisms of EPA's data from industry).

155 *Id.* at 213-14.

156 *See* Summary Memo; *see also* 78 Fed. Reg. at 34,458. In doing so, EPA was forced to change its conclusions on whether it was appropriate to have different standards for different sizes of plants. EPA had originally planned to have less stringent standards for plants smaller than 50 MW, and had concluded that such standards were appropriate for "small generating units." Redline at 79. When EPA was forced to expand its exemption to 400 MW, it also deleted its conclusion about "small" units, instead endorsing different standards "based on size" generally. *See id.* at 80.

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288 *See* Tennessee Department of Environment and Conservation, Permit No. TN0005428 (June 26, 2012).

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292 *See* Stantec, *Report of Geotechnical Exploration and Slope Stability Evaluation: Ash Pond / Stilling Pond Complex — Gallatin Fossil Plant Gallatin, Tennessee* (May 27, 2010), available at: http://www.tva.com/power/stantec2/GAF/GAF-GE-100527%20(rpt_001_175559018).pdf.

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295 TVA, Groundwater Monitoring Report – Allen Fossil Plant – February 2008, at 2 (Aug. 22, 2008).

296 *See, e.g.*, Letter from Robert J. Martineau, Jr., TDEC Commissioner, to Joshua Galperin, Southern Alliance for Clean Energy (Apr. 23, 2012) ("Industrial and municipal wastewater treatment plants, such as TVA ash ponds, are not subject to solid waste permitting process...When the ash pond is converted from a wastewater treatment unit to a solid waste management unit, oversight will be transferred to Solid Waste Management.")

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APPENDIX I: METHODOLOGY AND DATA LIMITATIONS

We identified 386 operating coal-fired power plants using the EPA's Clean Air Markets Program database. Using EPA's Enforcement and Compliance History Online (ECHO) database, we reviewed effluent limits and monitoring requirements for arsenic, boron, cadmium, lead, mercury, and selenium and expiration dates for each of the coal-fired power plants. Our review focused on these pollutants because they are almost always found in coal ash and scrubber waste and are particularly harmful to health or aquatic life. In addition, we reviewed whether each power plant discharged into impaired waters and included the cause of impairment if it was identified in the ECHO database. Our review focused on these pollutants because they are almost always fund in coal ash and scrubber waste and are particularly harmful to health or aquatic life. Where available, we reviewed individual permits for coal-fired power plants to identify waste streams discharged at the plant and any effluent limits and monitoring requirements for arsenic, boron, cadmium, lead, mercury, and selenium. Where data related to effluent limits and monitoring requirements in the ECHO database conflicted with the plant's current permit, the data in the plant's permit was used in the analysis. We did not have access to permits for all 386 plants.

In some cases, multiple power plants are regulated under a single permit. For example, the HMP&L Station 2, R.D. Green, and Robert Reid power plants in Kentucky are regulated under one discharge permit. These power plants are identified as three separate plants in our analysis (as opposed to one plant).

DATA LIMITATIONS: The information contained in this report is based on company self-reported data obtained through publicly accessible U.S. Environmental Protection Agency websites and Freedom of Information Act requests. Occasionally, government data may contain errors, either because information is inaccurately reported by the regulated entities or incorrectly transcribed by government agencies. This report is based on data retrieved in March of 2013, and subsequent data retrievals may differ slightly as some companies correct prior reports.

APPENDIX II

US COAL-FIRED POWER PLANTS

STATE	COUNTY	FACILITY NAME	OPERATOR	NAMEPLATE CAPACITY (MW)	NPDES PERMIT ID	PERMIT EXPIRATION DATE	POLLUTANTS MONITORED	POLLUTANTS WITH A LIMIT	COAL ASH OR SCRUBBER OUTFALL?	IMPAIRED WATER	CAUSE OF IMPAIRMENT
AL	Mobile	Barry	Alabama Power Company	1770.7	AL0002879	10/31/2013	Arsenic, Mercury	Arsenic, Mercury	Ash		
AL	Washington	Charles R Lowman	PowerSouth Energy Cooperative, Inc.	538	AL0003671	2/28/2010	Lead	None	Ash & Scrubber	Tombigee River	
AL	Colbert	Colbert	Tennessee Valley Authority	1350	AL0003867	5/31/2010	Arsenic, Lead	None	Ash		
AL	Shelby	E C Gaston	Alabama Power Company	2012.8	AL0003140	6/30/2012	Arsenic	Arsenic	Ash		
AL	Etowah	Gadsden	Alabama Power Company	138	AL0002887	1/31/2008	Arsenic	Arsenic	Ash	Coosa River (Neely Henry Lake)	Ph; Phosphorus
AL	Walker	Gorgas	Alabama Power Company	1416.7	AL0002909	9/5/2012	Arsenic	Arsenic	Ash		
AL	Greene	Greene County	Alabama Power Company	568.4	AL0002917	9/30/2012	Arsenic	Arsenic	Ash		
AL	Jefferson	James H Miller Jr	Alabama Power Company	2822	AL0027146	1/31/2012	None	None	Ash		
AL	Jackson	Widows Creek	Tennessee Valley Authority	1968.6	AL0003875	3/31/2010	Arsenic	None	Ash		
AR	Benton	Flint Creek Power Plant	Southwestern Electric Power Company	558	ARR00B277	6/30/2014	None	None	Ash	Swepco Lake	Ph; Phosphorus; Total Suspended Solids
AR	Independence	Independence	Entergy Corporation	1700	AR0037451	6/30/2017	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash & Scrubber		
AR	Mississippi	Plum Point Energy Station	Plum Point Energy Associates, Inc.	720	AR0049557	1/31/2012	Selenium	None	Ash		
AR	Jefferson	White Bluff	Entergy Corporation	1700	AR0036331	6/30/2017	None	None	Ash		
AZ	Cochise	Apache Station	Arizona Electric Power Cooperative	408	AZ0023795	2/21/2005	Arsenic, Selenium	None			
AZ	Navajo	Cholla	Arizona Public Service Company	1128.8	AZ0023311	8/10/2003	None	None			
AZ	Pima	Irvington Generating Station	Tucson Electric Power Company	173.3	AZS000013	None	None	None			
AZ	Coconino	Navajo Generating Station	Salt River Project	2409.3	AZU000010	None	None	None			
CO	Denver	Arapahoe	Public Service Company of Colorado	152.5	CO0001091	12/31/2012	Mercury, Lead, Selenium	Selenium	Ash	South Platte River	
CO	Adams	Cherokee	Public Service Company of Colorado	676.3	CO0001104	4/30/2014	Boron, Cadmium, Mercury, Lead, Selenium	Cadmium, Lead, Selenium	Ash	South Platte River	Cadmium
CO	Pueblo	Comanche	Public Service Company of Colorado	1635.3	CO0000612	10/31/2013	None	None		St. Charles River	Selenium
CO	Moffat	Craig	Tri-State Generation & Transmission	1427.6	COR900399	6/30/2017	None	None		Unnamed tributary -Johnson Gulch	
CO	Routt	Hayden	Public Service Company of Colorado	438.6	COR900429	6/30/2017	None	None		Marshall Roberts Ditch -Yampa River	
CO	Prowers	Lamar	Lamar Utilities Board	43.5	COR900436	6/30/2017	None	None		Arkansas River	
CO	El Paso	Martin Drake	Colorado Springs Utilities	257	CO0000850	10/31/2010	Lead, Arsenic, Selenium	None		Fountain Creek	
CO	Montrose	Nucla	Tri-State Generation & Transmission	113.8	CO0000540	10/31/2011	Mercury, Lead, Boron, Arsenic	None		San Miguel River	
CO	Larimer	Rawhide Energy Station	Platte River Power Authority	293.6	COR900559	6/30/2017	None	None		Boxelder Creek South Platte River	
CO	El Paso	Ray D Nixon	Colorado Springs Utilities	207	COR900550	6/30/2017	None	None		Unnamed Tributary - Little Fountain Creek	
CO	Boulder	Valmont	Public Service Company of Colorado	191.7	CO0001112	10/31/2017	Cadmium, Boron, Mercury, Arsenic	None	Ash	Tributaries to St. Vrain Creek	Selenium

US COAL-FIRED POWER PLANTS

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CT	Fairfield	Bridgeport Harbor Station	PSEG Power Connecticut, LLC	400	CT0030180	12/29/2010	Lead	None		Cedar Creek/ Long Island Sound; Brideport Harbor	Nutrients
DE	Sussex	Indian River	Indian River Power, LLC	782.4	DE0050580	12/31/2016	None	None	Ash		
DE	Kent	NRG Energy Center Dover	NRG Energy, Inc	18	DE0050466	8/31/2013	None	None			
FL	Hillsborough	Big Bend	Tampa Electric Company	1822.5	FL0000817	12/29/2016	Arsenic, Mercury, Lead, Selenium	Mercury	Scrubber	Big Bend Bayou	
FL	Polk	C D McIntosh Jr Power Plant	City of Lakeland - Lakeland Electric	363.8	FL0026301	12/5/2015	None	None			
FL	Duval	Cedar Bay Generating Co. LP	Cedar Bay Operating Services LLC	291.6	FL0061204	11/4/2015	None	None		Broward River	
FL	Escambia	Crist Electric Generating Plant	Gulf Power Company	1135.1	FL0002275	1/27/2016	Arsenic, Cadmium, Mercury, Lead, Selenium	Arsenic, Cadmium, Mercury, Lead, Selenium	Ash		
FL	Citrus	Crystal River	Florida Power Corporation	2442.7	FL0000159	3/11/2017	Arsenic, Cadmium, Mercury, Lead, Selenium	Arsenic, Cadmium, Mercury, Lead, Selenium			
FL	Orange	Curtis H. Stanton Energy Center	Orlando Utilities Commission	929	FL0681661	6/23/2016	None	None			
FL	Alachua	Deerhaven	Gainesville Regional Utilities	250.7	FLR05B392	2/2/2016	None	None			
FL	Martin	Indiantown Cogeneration, LP	Indiantown Cogeneration Limited Partnership	395.4	FLR05B625	4/28/2015	None	None			
FL	Bay	Lansing Smith Generating Plant	Gulf Power Company	340	FL0002267	12/1/2014	Arsenic, Cadmium, Mercury, Lead, Selenium, Boron	Lead	Ash	Alligator Bayou	
FL	Duval	Northside	JEA	595	FL0001031	5/8/2017	Arsenic, Cadmium, Mercury, Lead, Selenium	Arsenic, Mercury, Lead, Selenium			
FL	Polk	Polk	Tampa Electric Company	326.3	FL0043869	3/30/2014	Arsenic, Cadmium, Lead, Selenium	Arsenic, Cadmium, Lead, Selenium	Ash		
FL	Jackson	Scholz Electric Generating Plant	Gulf Power Company	98	FL0002283	9/22/2015	Cadmium, Lead	Lead	Ash	Apalachicola River	
FL	Putnam	Seminole	Seminole Electric Cooperative, Inc.	1429.2	FL0036498	8/28/2017	Arsenic, Cadmium, Lead, Mercury	Selenium, Lead, Mercury	Scrubber	Rice Creek	Cadmium; Iron; Lead; Nickel; Silver
FL	Duval	St. Johns River Power	JEA	1358	FL0037869	2/9/2011	Arsenic, Mercury, Lead	Arsenic, Mercury, Selenium	Ash		
GA	Bartow	Bowen	Georgia Power Company	3498.6	GA0001449	6/30/2012	None	None	Scrubber	Etowah River	
GA	Floyd	Hammond	Georgia Power Company	953	GA0001457	6/30/2012	None	None	Ash & scrubber	Coosa River	
GA	Putnam	Harllee Branch	Georgia Power Company	1746.2	GA0026051	2/28/2010	None	None	Ash		
GA	Chatham	Kraft	Georgia Power Company	207.9	GA0003816	5/31/2004	Arsenic, Lead, Mercury, Selenium, Cadmium	None	Ash		
GA	Effingham	McIntosh (6124)	Georgia Power Company	177.6	GA0003883	5/31/2004	Arsenic, Lead, Mercury, Selenium, Cadmium	None	Ash		
GA	Dougherty	Mitchell	Georgia Power Company	163.2	GA0001465	2/28/2015	None	None	Ash		
GA	Monroe	Scherer	Georgia Power Company	3564	GA0035564	11/30/2006	None	None	Ash		
GA	Heard	Wansley	Georgia Power Company	1904	GA0026778	8/31/2011	None	None			
GA	Coweta	Yates	Georgia Power Company	1487.3	GA0001473	8/31/2011	None	None	Ash & Scrubber	Chattahoochee River	
IA	Story	Ames	City of Ames	108.8	IA0033235	7/22/2006	None	None	Ash	South Skunk River	
IA	Des Moines	Burlington	Interstate Power & Light Company	212	IA0001783	9/4/2011	None	None	Ash		

US COAL-FIRED POWER PLANTS

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IA	Clay	Earl F Wisdom	Corn Belt Power Cooperative	33	IA0004570	3/26/2007	None	None			
IA	Muscatine	Fair Station	Central Iowa Power Cooperative	62.5	IA0001562	10/20/2014	None	None	Ash		
IA	Woodbury	George Neal North	MidAmerican Energy Company	1046	IA0004103	11/30/2016	None	None	Ash	Missouri River	Mercury (Fish Consumption Advisory)
IA	Woodbury	George Neal South	MidAmerican Energy Company	640	IA0061859	3/30/2014	None	None	Ash	Missouri River	Mercury (Fish Consumption Advisory)
IA	Allamakee	Lansing	Interstate Power & Light Company	312	IA0003735	10/1/2003	Lead	Lead	Ash		
IA	Louisa	Louisa	MidAmerican Energy Company	811.9	IA0063282	3/31/2017	None	None	Ash		
IA	Clinton	Milton L Kapp	Interstate Power & Light Company	218.5	IA0001759	7/15/2004	None	None	Ash		
IA	Muscatine	Muscatine	Muscatine Power and Water	293.5	IA0001082	5/22/2008	None	None	Ash		
IA	Wapello	Ottumwa	Interstate Power & Light Company	725.9	IA0060909	3/4/2008	None	None	Ash		
IA	Marion	Pella	City of Pella	38	IA0032701	12/19/2009	None	None	Ash		
IA	Linn	Prairie Creek	Interstate Power & Light Company	213.4	IA0000540	7/31/2015	None	None	Ash		
IA	Scott	Riverside	MidAmerican Energy Company	141	IA0003611	12/31/2016	None	None	Ash		
IA	Black Hawk	Streeter Station	Cedar Falls Municipal Electric	51.5	IA0002534	8/31/2017	None	None			
IA	Marshall	Sutherland	Interstate Power & Light Company	119.1	IA0000108	11/12/2011	None	None	Ash		
IA	Pottawattamie	Walter Scott Jr. Energy Center	MidAmerican Energy Company	1778.9	IA0004308	2/26/2008	None	None	Ash		
IL	Randolph	Baldwin Energy Complex	Dynegy Midwest Generation Inc.	1894.1	IL0000043	4/30/2010	None	None	Ash		
IL	Montgomery	Coffeen	Ameren Energy Generating Company	1005.4	IL0000108	1/31/2013	Boron, Mercury	None	Ash	Coffeen Lake	Phosphorus; Total Suspended Solids; Total Dissolved Solids; Ph
IL	Sangamon	Dallman	City of Springfield, IL	667.7	IL0024767	12/31/2006	Boron	Boron	Ash & Scrubber	Illinois River	Mercury; Silver; Nitorgen; Phosphorus; Total Suspended Solids; Fish Consumption Advisory
IL	Fulton	Duck Creek	Ameren Energy Resources Generating Company	441	IL0055620	2/28/2013	Boron, Mercury	Boron	Ash	Illinois River	Silver, Boron, Iron, Mercury
IL	Peoria	E D Edwards	Ameren Energy Resources Generating Company	780.3	IL0001970	1/31/2011	None	None	Ash	South Branch of the Chicago River	Fish Consumption Advisory
IL	Mason	Havana	Dynegy Midwest Generation Inc.	488	IL0001571	9/30/2017	Mercury	None	Ash & Scrubber	Illinois River	Mercury; Silver; Nitorgen; Phosphorus; Total Suspended Solids; Fish Consumption Advisory
IL	Putnam	Hennepin Power Station	Dynegy Midwest Generation Inc.	306.3	IL0001554	4/30/2016	Mercury	None	Ash	Illinois River	Mercury (Fish Consumption Advisory)
IL	Will	Joliet 29	Midwest Generation EME, LLC	1320	IL0064254	11/30/2000	None	None	Ash	Des Plaines River	Mercury (Fish Consumption Advisory)
IL	Will	Joliet 9	Midwest Generation EME, LLC	360.4	IL0002216	3/31/2001	None	None	Ash	Des Plaines River	Fish Consumption Advisory
IL	Massac	Joppa Steam	Electric Energy, Inc.	1099.8	IL0004171	7/31/2014	Boron, Mercury	None	Ash	Ohio River	
IL	Christian	Kincaid Station	Dominion Energy Services Company	1319	IL0002241	4/30/2005	None	None	Ash	Lake Sangchris	Nutrients
IL	Williamson	Marion	Southern Illinois Power Cooperative	272	IL0004316	2/29/2012	Boron, Mercury	Boron	Ash & Scrubber		
IL	Jasper	Newton	Ameren Energy Generating Company	1234.8	IL0049191	1/31/2012	Boron, Mercury	Boron	Ash & Scrubber	Newton Lake	Nutrients
IL	Tazewell	Powerton	Midwest Generation EME, LLC	1785.6	IL0002232	10/31/2010	None	None	Ash		
IL	Washington	Prairie State Generating Company	Prairie State Generating Company	245	IL0076996	11/30/2010	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash	Illinois River	Mercury
IL	Lake	Waukegan	Midwest Generation LLC	681.7	IL0002259	7/31/2005	None	None	Ash		
IL	Will	Will County	Midwest Generation EME, LLC	897.6	IL0002208	5/31/2010	None	None	Ash	Chicago Sanitary & Ship Canal	Iron; Oil; Nitrogen; Phosphorus; Fish Consumption Advisory

US COAL-FIRED POWER PLANTS

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IL	Madison	Wood River Power Station	Dynegy Midwest Generation Inc.	500.1	IL0000701	12/31/2014	Arsenic, Cadmium	Boron	Ash	Wood River	Copper; Manganese; Total Dissolved Solids; Phosphorus; Total Suspended Solids; Ph
IN	Posey	A B Brown Generating Station	Southern Indiana Gas and Electric Company	530.4	IN0052191	9/30/2016	Arsenic, Boron, Cadmium, Mercury, Selenium	None	Ash	Ohio River - Evansville to Uniontown	Mercury (fish tissue)
IN	Warrick	Alcoa Allowance Management Inc	Alcoa Allowance Management, Inc.	777.6	IN0055051	3/31/1991	None	None	Ash & Scrubber	Ohio River - Cannelton to Newburgh	Mercury (fish tissue)
IN	Porter	Bailly Generating Station	Northern Indiana Public Service Company	603.5	IN0000132	7/31/2017	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	None	Ash	Lake Michigan Shoreline - Dunes	Mercury
IN	Marion	C. C. Perry K Steam Plant	Citizens Thermal	23.4	IN0004677	12/31/2016	Mercury	None			
IN	Vermillion	Cayuga	Duke Energy Corporation	1062	IN0002763	7/31/2012	Arsenic, Cadmium, Selenium, Mercury	Mercury	Ash	Wabash River	Mercury (fish tissue)
IN	Jefferson	Clifty Creek	Indiana Kentucky Electric Corp	1303.8	IN0001759	1/31/2017	Arsenic, Boron, Cadmium, Mercury, Selenium, Lead	None	Ash		
IN	Warrick	F B Culley Generating Station	Southern Indiana Gas and Electric Company	368.9	IN0002259	11/30/2016	Arsenic, Boron, Cadmium, Mercury, Selenium	Cadmium, Mercury	Ash		
IN	Pike	Frank E Ratts	Hoosier Energy REC, Inc.	233.2	IN0004391	9/30/2017	Arsenic, Mercury, Selenium	None	Ash	White River	Mercury (fish tissue)
IN	Morgan	IPL - Eagle Valley Generating Station	Indianapolis Power & Light Company	301.6	IN0004693	9/30/2017	Arsenic, Cadmium, Lead, Mercury, Selenium, Boron	None	Ash	White River	Mercury (fish tissue)
IN	Marion	IPL - Harding Street Station (EW Stout)	Indianapolis Power & Light Company	698	IN0004685	9/30/2017	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Cadmium, Lead, Mercury (effective Aug. 28, 2015)	Ash & Scrubber	White River	Mercury (fish tissue)
IN	Pike	IPL - Petersburg Generating Station	Indianapolis Power & Light Company	2146.7	IN0002887	9/30/2017	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Boron, Cadmium, Lead, Mercury, Selenium (effective Sept. 28, 2015)	Ash & Scrubber	White River	Mercury (fish tissue)
IN	Sullivan	Merom	Hoosier Energy REC, Inc.	1080	IN0050296	12/31/2015	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Scrubber		
IN	LaPorte	Michigan City Generating Station	Northern Indiana Public Service Company	540	IN0000116	2/29/2016	Cadmium, Mercury, Lead	None	Ash	Lake Michigan Shoreline-Dunes	Mercury (Fish Consumption Advisory)
IN	Floyd	R Gallagher	Duke Energy Corporation	600	IN0002798	8/31/2015	Arsenic, Cadmium, Selenium	None	Ash		
IN	Jasper	R M Schahfer Generating Station	Northern Indiana Public Service Company	1943.4	IN0053201	4/30/2015	Arsenic, Cadmium, Mercury, Lead, Selenium	None			
IN	Spencer	Rockport	Indiana Michigan Power Company	2600	IN0051845	11/30/2015	Boron, Mercury, Lead, Selenium	Lead, Selenium	Ash & Scrubber	Ohio River - Cannelton to Newburgh	Mercury (fish tissue)
IN	Dearborn	Tanners Creek	Indiana Michigan Power Company	1100.1	IN0002160	5/31/2015	Arsenic, Cadmium, Mercury	None	Ash	Ohio River and Tanners Creek	Mercury in fish tissue
IN	Vigo	Wabash River Gen Station	Duke Energy Corporation	860.2	IN0063134	10/31/2013	Arsenic, Mercury	None	Ash	Wabash River - Wabash Gen Sta to Lost Creek	Mercury (Fish Consumption Advisory)
IN	Wayne	Whitewater Valley	City of Richmond	93.9	IN0063151	11/30/2013	None	None		Short Creek and other Tribs	
KS	Finney	Holcomb	Sunflower Electric Power Corporation	348.7	KS0080063	12/31/2011	Arsenic, Cadmium, Lead, Selenium	None			
KS	Pottawatomie	Jeffrey Energy Center	Westar Energy, Inc.	2160	KS0080632	5/31/2013	Arsenic, Cadmium, Mercury, Lead, Selenium	Mercury		Deep Creek	Phosphorus

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KS	Linn	La Cygne	Kansas City Power & Light Company	1578	KS0080071	10/31/2009	None	None	Ash & Scrubber		
KS	Douglas	Lawrence Energy Center	Westar Energy, Inc.	566	KS0079821	3/31/2013	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash & Scrubber		
KS	Wyandotte	Nearman Creek	Kansas City Board of Public Utilities	261	KS0119075	12/31/2008	None	None	Ash		
KS	Wyandotte	Quindaro	Kansas City Board of Public Utilities	239.1	KS0080942	12/31/2008	None	None			
KS	Cherokee	Riverton	Empire District Electric Company	87.5	KS0079812	12/31/2013	Lead	None	Ash	Spring River	
KS	Shawnee	Tecumseh Energy Center	Westar Energy, Inc.	232	KS0079731	7/31/2017	None	None	Ash	Kansas River	Lead
KY	Lawrence	Big Sandy	Kentucky Power Company	1096.8	KY0000221	3/31/2006	None	None	Ash	Big Sandy River	Iron
KY	Jefferson	Cane Run	LGE and KU Energy LLC	644.6	KY0002062	10/31/2007	None	None	Ash		
KY	Hancock	Coleman	Big Rivers Electric Corporation	602	KY0001937	2/28/2005	None	None	Ash	Ohio River	Mercury in fish tissue
KY	Ohio	D B Wilson	Big Rivers Electric Corporation	566.1	KY0054836	10/31/2004	None	None	Scrubber		
KY	Mercer	E W Brown	LGE and KU Energy LLC	757.1	KY0002020	2/28/2015	None	None	Ash	Herrington Lake	Methylmercury (Fish Consumption Advisory); Ph; Total Suspended Solids
KY	Boone	East Bend	Duke Energy Corporation	669.3	KY0040444	7/31/2007	None	None	Ash & Scrubber		
KY	Daviess	Elmer Smith	Owensboro Municipal Utilities	445.3	KY0001295	3/31/2005	None	None	Ash & Scrubber	Ohio River (Cannelton to Newburgh)	Mercury (Fish Consumption Advisory)
KY	Carroll	Ghent	Kentucky Utilities Company	2225.9	KY0002038	6/30/2007	None	None	Ash		
KY	Muhlenberg	Green River	Kentucky Utilities Company	188.6	KY0002011	10/31/2004	None	None	Ash		
KY	Mason	H L Spurlock	East Kentucky Power Cooperative	1608.5	KY0022250	4/30/2004	None	None	Ash		
KY	Henderson	HMP&L Station 2	Big Rivers Electric Corporation	405	KY0001929	11/30/2009	None	None	Ash		
KY	Pulaski	John S. Cooper	East Kentucky Power Cooperative	344	KY0003611	10/31/2013	None	None	Ash & Scrubber	Lake Cumberland	Methylmercury
KY	Jefferson	Mill Creek	LGE and KU Energy LLC	1717.2	KY0003221	10/31/2007	None	None	Ash & Scrubber	Ohio River/Mill Creek/Pond Creek	
KY	Muhlenberg	Paradise	Tennessee Valley Authority	2558.2	KY0004201	10/31/2009	None	None	Ash		
KY	Webster	R D Green	Big Rivers Electric Corporation	586	KY0001929	11/30/2009	None	None	Ash		
KY	Webster	Robert Reid	Big Rivers Electric Corporation	96	KY0001929	11/30/2009	None	None	Ash		
KY	McCracken	Shawnee	Tennessee Valley Authority	1750	KY0004219	8/31/2010	None	None	Ash & Scrubber		
KY	Trimble	Trimble County	LGE and KU Energy LLC	1400.1	KY0041971	4/30/2015	None	None	Scrubber		
KY	Woodford	Tyrone	Kentucky Utilities Company	75	KY0001899	1/31/2007	None	None	Ash	Kentucky River, 53.2 to 66.95	Methylmercury (Fish Consumption Advisory)
KY	Clark	William C. Dale	East Kentucky Power Cooperative	216	KY0002194	11/30/2006	None	None	Ash	Kentucky River, 121.1 to 138.5	Methylmercury (Fish Consumption Advisory)
LA	Pointe Coupee	Big Cajun 2	Louisiana Generating, LLC	1871	LA0054135	4/30/2014	None	None	Ash		
LA	Rapides	Brame Energy Center	Cleco Power LLC	558	LA0008036	3/31/2011	Lead	Lead	Ash		
LA	De Soto	Dolet Hills Power Station	Cleco Power LLC	720.7	LA0062600	10/28/2017	Lead	Lead	Ash & Scrubber		
LA	Calcasieu	R S Nelson	Entergy Corporation	614.6	LA0005843	9/30/2014	Lead	Lead	Ash	Houston River - From Bear Head Creek to West Fork Calcasieu	
MA	Bristol	Brayton Point	Dominion Energy Brayton Point, LLC	1124.6	MA0003654	5/31/2017	Cadmium, Lead	None	Ash	Mount Hope Bay	Nutrients; Unknown Toxicity
MA	Hampden	Mount Tom	FirstLight Power Resources	136	MA0005339	9/17/1997	None	None	Ash	Connecticut River	Mercury (Fish Consumption Advisory)
MA	Essex	Salem Harbor Station	Footprint Power Salem Harbor Operations LLC	329.6	MA0005096	10/29/1999	Arsenic, Cadmium, Lead, Mercury, Selenium	None	Ash		

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MD	Allegany	AES Warrior Run	AES Corporation	229	MD0066079	12/31/2017	None	None		Lower North Branch Potomac River	Cadmium; Nickel; Ph; Phosphorus
MD	Anne Arundel	Brandon Shores	Raven Power Fort Smallwood LLC	1370	MD0001503	4/30/2014	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Scrubber		
MD	Baltimore	C P Crane	C.P. Crane LLC	399.8	MD0001511	6/30/2015	None	None	Ash	Middle River - Browns Creek (tidal)	
MD	Prince George's	Chalk Point	GenOn Chalk Point, LLC	728	MD0002658	6/30/2014	None	None	Scrubber		
MD	Montgomery	Dickerson	GenOn Mid-Atlantic, LLC	588	MD0002640	10/31/2014	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash & Scrubber		
MD	Anne Arundel	Herbert A Wagner	Raven Power Fort Smallwood LLC	495	MD0001503	4/30/2014	None	None	Ash		
MD	Charles	Morgantown	GenOn Mid-Atlantic, LLC	1252	MD0002674	10/31/2014	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash & Scrubber		
MI	Muskegon	B C Cobb	Consumers Energy Company	312.6	MI0001520	10/1/2013	Mercury	None	Ash	Rivers/ Streams in HUC 040601021004	Mercury (Fish Consumption Advisory)
MI	Saint Clair	Belle River	Detroit Edison Company	1395	MI0038172	10/1/2013	Arsenic, Mercury, Selenium	Mercury, Selenium	Ash	Rivers/ Streams in HUC 040900010407	Fish Consumption Advisory
MI	Bay	Dan E Karn	Consumers Energy Company	544	MI0001678	10/1/2011	Mercury	Mercury	Ash	Rivers/ Streams in HUC 040801030101	Fish Consumption Advisory
MI	Ingham	Eckert Station	Lansing Board of Water and Light	375	MI0004464	10/1/2012	Mercury	None		Rivers/ Streams in HUC 040500040703	Mercury (Fish Consumption Advisory)
MI	Hillsdale	Endicott Generating	Michigan South Central Power Agency	55	MI0039608	10/1/2016	Arsenic, Boron, Cadmium, Mercury, Selenium	Boron, Selenium			
MI	Eaton	Erickson	Lansing Board of Water and Light	154.7	MI0005428	10/1/2012	Selenium	None		Rivers/ Streams in HUC 040500040704	Mercury (Fish Consumption Advisory)
MI	Huron	Harbor Beach	Detroit Edison Company	121	MI0001856	10/1/2014	Mercury, Selenium	None	Ash		
MI	Ottawa	J B Sims	Grand Haven Board of Light and Power	80	MI0000728	10/1/2015	Mercury, Selenium	None	Ash & Scrubber	Grand River	Mercury; Mercury in fish tissue
MI	Bay	J C Weadock	Consumers Energy Company	312.6	MI0001678	10/1/2011	Mercury	Mercury	Ash	Rivers/ Streams in HUC 040801030101	Fish Consumption Advisory
MI	Ottawa	J H Campbell	Consumers Energy Company	1585.9	MI0001422	10/1/2011	Mercury	None	Ash		
MI	Monroe	J R Whiting	Consumers Energy Company	345.4	MI0001864	10/1/2012	Mercury, Lead, Selenium	Mercury	Ash		
MI	Ottawa	James De Young	City of Holland	62.8	MI0001473	10/1/2011	None	None	Ash	Rivers/ Streams in HUC 040500020408	
MI	Monroe	Monroe	Detroit Edison Company	3279.6	MI0001848	10/1/2014	Mercury	Mercury	Ash & Scrubber	Rivers/ Streams in HUC 041000020410	Mercury (Fish Consumption Advisory)
MI	Marquette	Presque Isle	Wisconsin Electric Power Company	450	MI0006106	10/1/2012	None	None	Ash		
MI	Wayne	River Rouge	Detroit Edison Company	650.6	MI0001724	10/1/2012	Boron, Mercury, Selenium	None	Ash	Rivers/ Streams in HUC 040900040407	Mercury (Fish Consumption Advisory)
MI	Marquette	Shiras	Marquette Board of Light and Power	77.5	MI0006076	10/1/2012	Arsenic, Mercury, Selenium	None	Ash		
MI	Saint Clair	St. Clair	Detroit Edison Company	1547	MI0001686	10/1/2013	Mercury	Mercury	Ash		
MI	Manistee	TES Filer City Station	CMS Enterprises Co.	70	None	None	None	None			
MI	Wayne	Trenton Channel	Detroit Edison Company	775.5	MI0001791	10/1/2012	Mercury	None	Ash		
MI	Wayne	Wyandotte	Wyandotte Municipal Services	73	MI0038105	10/1/2012	Cadmium, Mercury, Selenium	Mercury	Ash		
MN	Washington	Allen S King	Northern States Power (Xcel Energy)	598.4	MN0000825	1/31/2010	None	None	Ash		

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MN	Dakota	Black Dog	Northern States Power (Xcel Energy)	293.1	MN0000876	2/28/2013	Mercury	None	Ash		
MN	Itasca	Boswell Energy Center	Minnesota Power, Inc.	1072.5	MN0001007	2/29/2012	Lead, Mercury	Mercury	Ash & Scrubber	Blackwater	
MN	Otter Tail	Hoot Lake	Otter Tail Power Company	129.4	MN0002011	11/30/2012	Mercury	None			
MN	Saint Louis	Laskin Energy Center	Minnesota Power, Inc.	116	MN0000990	3/31/2010	Boron, Mercury, Selenium	Mercury	Ash & Scrubber		
MN	Sherburne	Sherburne County	Northern States Power (Xcel Energy)	2430.6	MN0002186	7/31/2014	None	None			
MN	Olmsted	Silver Lake	Rochester Public Utilities	99	MN0001139	2/28/2013	None	None			
MN	Cook	Taconite Harbor Energy Center	Minnesota Power, Inc.	252	MN0002208	11/30/2010	Mercury	None			
MO	Jasper	Asbury	Empire District Electric Company	231.5	MO0095362	12/1/2010	None	None	Ash		
MO	Jackson	Blue Valley	Independence Power and Light	115	MO0115924	5/5/2016	None	None	Ash		
MO	Osage	Chamois Power Plant	Associated Electric Cooperative, Inc.	59	MO0004766	5/15/2008	None	None	Ash		
MO	Boone	Columbia	City of Columbia	38.5	MO0004979	7/5/2017	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash		
MO	Jackson	Hawthorn	Kansas City Power & Light Company	594.3	MO0004855	7/27/2005	None	None			
MO	Platte	Iatan	Kansas City Power & Light Company	1640	MO0082996	2/5/2009	None	None			
MO	Greene	James River	City of Springfield, MO	253	MOR109Z51	3/7/2012	Arsenic, Boron, Cadmium, Lead, Mercury, Selenium	None	Ash	Lake Springfield	
MO	Greene	John Twitty Energy Center	City of Springfield, MO	494	MO0089940	8/12/2015	Selenium	Selenium	Ash		
MO	Franklin	Labadie	Union Electric Company	2389.4	MO0004812	3/17/1999	None	None	Ash		
MO	Buchanan	Lake Road	KCP&L Greater Missouri Operations Company	90	MO0004898	6/12/2008	None	None	Ash		
MO	Saint Louis	Meramec	Union Electric Company	923	MO0000361	5/18/2005	None	None	Ash	Mississippi River	Manganese; Fish Consumption Advisory
MO	Henry	Montrose	Kansas City Power & Light Company	564	MO0101117	3/26/2014	Boron	None	Ash		
MO	New Madrid	New Madrid Power Plant	Associated Electric Cooperative, Inc.	1200	MO0001171	4/21/2016	None	None	Ash		
MO	Jefferson	Rush Island	Union Electric Company	1242	MO0000043	9/30/2009	None	None	Ash		
MO	Jackson	Sibley	KCP&L Greater Missouri Operations Company	524	MO0004871	11/2/2005	None	None	Ash & Scrubber		
MO	Scott	Sikeston	Sikeston Bd. of Municipal Utilities	261	MO0095575	2/12/2014	None	None			
MO	Saint Charles	Sioux	Union Electric Company	1099.4	MO0000353	4/15/2009	None	None	Ash		
MO	Randolph	Thomas Hill Energy Center	Associated Electric Cooperative, Inc.	1135	MO0097675	12/23/2008	None	None	Ash & Scrubber		
MS	Jackson	Daniel Electric Generating Plant	Mississippi Power Company	1096.6	MS0024511	12/31/2013	None	None	Ash		
MS	Lamar	R D Morrow Senior Generating Plant	South Mississippi Elec. Power Assoc	400	MS0028258	12/31/2010	None	None	Ash & Scrubber		
MS	Choctaw	Red Hills Generation Facility	Tractebel Power, Inc.	513.7	MS0053881	12/31/2016	Selenium	Selenium			
MS	Harrison	Watson Electric Generating Plant	Mississippi Power Company	877.2	MS0002925	11/30/2013	None	None	Ash		
MT	Big Horn	Hardin Generating Station	Colorado Energy Management, LLC	115.7	MTR000457	9/30/2011	None	None			

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MT	Yellowstone	J E Corette	P P & L Montana, LLC	172.8	MT0000396	3/1/2005	None	None	Ash	Yellowstone River	Arsenic; Nutrients
MT	Richland	Lewis & Clark	Montana Dakota Utilities Company	50	MT0000302	11/30/2005	None	None	Ash	Yellowstone River	Chromium, Copper, Lead
NC	Buncombe	Asheville	Carolina Power & Light Company	413.6	NC0000396	12/31/2010	Arsenic, Cadmium, Mercury, Lead, Selenium	Mercury	Ash & Scrubber		
NC	Stokes	Belews Creek	Duke Energy Corporation	2160.2	NC0024406	2/28/2017	Arsenic, Mercury, Selenium	None	Ash & Scrubber		
NC	Rowan	Buck	Duke Energy Carolinas, LLC	250	NC0004774	8/31/2016	Arsenic, Selenium, Mercury	None	Ash		
NC	Cleveland	Cliffside	Duke Energy Corporation	570.9	NC0005088	7/31/2015	Arsenic, Selenium, Cadmium, Mercury	None	Ash & Scrubber		
NC	Edgecombe	Edgecombe Genco, LLC	Edgecombe Genco, LLC	114.8	NC0077437	10/31/2014	None	None			
NC	Gaston	G G Allen	Duke Energy Corporation	1155	NC0004979	5/31/2015	Arsenic, Cadmium, Mercury, Selenium	None	Ash & Scrubber		
NC	New Hanover	L V Sutton	Carolina Power & Light Company	671.6	NC0001422	12/31/2016	Arsenic, Mercury, Selenium	Arsenic, Selenium	Ash		
NC	Robeson	Lumberton Power	Lumberton Energy, LLC	34.7	NC0058301	7/31/2014	Mercury	None			
NC	Marshall	Marshall	Tennessee Valley Authority	1996	NC0004987	4/30/2015	Arsenic, Boron, Selenium	Selenium	Ash & Scrubber		
NC	Person	Mayo	Carolina Power & Light Company	735.8	NC0038377	3/31/2012	Arsenic, Cadmium,Lead, Selenium, Mercury, Boron	Cadmium, Lead, Mercury, Boron	Ash & Scrubber		
NC	Gaston	Riverbend	Duke Energy Corporation	466	NC0004961	2/28/2015	Arsenic, Mercury, Selenium	None	Ash		
NC	Person	Roxboro	Carolina Power & Light Company	2558.2	NC0065081	5/31/2012	Cadmium, Lead	Cadmium, Lead	Ash & Scrubber		
NC	Halifax	Westmoreland Partners Roanoke Valley I	Westmoreland Partners LLC	182.3	NCS000229	6/30/2012	None	None			
NC	Halifax	Westmoreland Partners Roanoke Valley II	Westmoreland Partners LLC	57.8	NCS000229	6/30/2012	None	None			
ND	Mercer	Antelope Valley	Basin Electric Power Cooperative	869.8	ND0024945	6/30/2013	None	None	Ash		
ND	Mercer	Coyote	Otter Tail Power Company	450	ND0024996	3/31/2013	None	None	Ash		
ND	Mercer	Leland Olds	Basin Electric Power Cooperative	656	ND0025232	12/31/2016	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash		
ND	Oliver	Milton R Young	Minnkota Power Cooperative, Inc.	734	ND0000370	6/30/2015	Boron	None	Ash & Scrubber		
ND	Morton	R M Heskett	Montana Dakota Utilities Company	115	ND0000264	3/31/2013	None	None	Ash		
ND	Mercer	Stanton	Great River Energy	190.2	ND0000299	12/31/2016	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash		
NE	Lincoln	Gerald Gentleman Station	Nebraska Public Power District	1362.6	NE0111546	9/30/2016	None	None			
NE	Adams	Gerald Whelan Energy Center	Nebraska Municipal Energy Agency	324.3	NE0113506	9/30/2017	Cadmium, Mercury, Lead, Selenium	None	Ash & Scrubber		
NE	Dodge	Lon D Wright Power Plant	City of Fremont	130	NE0001252	6/30/2015	Cadmium, Mercury, Lead	None			
NE	Otoe	Nebraska City Station	Omaha Public Power District	1389.6	NE0111635	6/30/2013	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash		
NE	Douglas	North Omaha Station	Omaha Public Power District	644.7	NE0000621	9/30/2013	Arsenic, Cadmium, Mercury, Lead	None	Ash		
NE	Hall	Platte	Grand Island Utilities Dept.	109.8	NE0113646	9/30/2017	None	None	Ash		

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NE	Lancaster	Sheldon	Nebraska Public Power District	228.7	NE0111490	9/30/2016	Cadmium, Lead	None	Ash		
NH	Merrimack	Merrimack	Public Service of New Hampshire	459.2	NH0001465	7/31/1997	Cadmium, Lead	None	Ash & Scrubber	Merrimack River	
NH	Rockingham	Schiller	Public Service of New Hampshire	100	NH0001473	9/30/1995	Arsenic, Cadmium, Mercury, Lead, Selenium	None		Lower Piscataqua River	
NJ	Hudson	Hudson Generating Station	PSEG	659.7	NJ0000647	9/30/2016	Mercury, Lead, Arsenic	None	Ash		
NJ	Gloucester	Logan Generating Plant	Logan Generating Co. LP	242.3	NJ0076872	9/30/2011	Arsenic	Arsenic			
NJ	Mercer	Mercer Generating Station	PSEG	652.8	NJ0004995	10/31/2011	Arsenic, Cadmium, Mercury, Selenium, Lead	None	Ash		
NM	McKinley	Escalante	Tri-State Generation & Transmission	257	NMR05A996	10/29/2005	None	None			
NM	San Juan	Four Corners Steam Elec Station	Arizona Public Service Company	2269.6	NN0000019	4/6/2006	None	None	Ash		
NM	San Juan	San Juan	Public Service Company of New Mexico	1848	NM0028606	3/31/2016	Boron, Selenium	None			
NY	Jefferson	Black River Generation, LLC	Black River Generation, LLC	55.5	NY0206938	7/31/2017	Arsenic, Mercury, Lead	Arsenic, Lead, Mercury			
NY	Tompkins	Cayuga Operating Company, LLC	Cayuga Operating Company, LLC	322.5	NY0001333	12/31/2014	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Arsenic, Cadmium, Mercury, Lead, Selenium	Ash & Scrubber		
NY	Orange	Dynegy Danskammer	Dynegy Power Corporation	386.5	NY0006262	5/31/2011	Arsenic, Cadmium, Mercury, Lead, Selenium	Arsenic, Cadmium, Mercury, Lead, Selenium	Ash	Hudson River	Cadmium; PCBS
NY	Erie	Huntley Power	Huntley Power, LLC	436	NY0001023	6/1/2008	Arsenic, Cadmium, Mercury, Lead, Selenium	Lead			
NY	Chautauqua	NRG Dunkirk Power	NRG Energy, Inc	627.2	NY0002321	4/30/2015	Arsenic, Cadmium, Mercury, Lead, Selenium	Mercury, Lead	Ash		
NY	Niagara	Somerset Operating Company (Kintigh)	Somerset Operating Company, LLC	655.1	NY0104213	12/31/2013	Arsenic, Boron, Mercury	Mercury			
NY	Onondaga	Syracuse Energy Corporation	SUEZ Energy Generation NA	101.1	NY0213586	4/30/2015	Lead	None			
OH	Ashtabula	Ashtabula	FirstEnergy Generation Corporation	256	OH0001121	1/31/2013	Mercury	Mercury	Ash & Scrubber	Lake Erie Central Basin Shoreline	Ph; Total Suspended Solids
OH	Lorain	Avon Lake Power Plant	GenOn Power Operating Services Midwest, Inc.	766	OH0001112	7/31/2015	Mercury, Selenium	Mercury	Ash	Lake Erie Central Basin Shoreline	Ph; Total Suspended Solids
OH	Lucas	Bay Shore	FirstEnergy Generation Corporation	498.8	OH0002925	7/31/2015	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Mercury	Ash	Lake Erie Tributaries (East of Maumee River to West of Toussant River)	Arsenic; Total Suspended Solids; Oil & Grease
OH	Jefferson	Cardinal	Cardinal Operating Company	1880.4	OH0012581	7/31/2012	Arsenic, Boron, Mercury, Lead, Selenium	None	Ash & Scrubber	Ohio River (Upper South)	Iron
OH	Coshocton	Conesville	Ohio Power Company	1890.8	OH0005371	7/31/2012	Boron, Cadmium, Mercury, Lead, Selenium	Mercury, Selenium	Ash & Scrubber		
OH	Lake	Eastlake	FirstEnergy Generation Corporation	1257	OH0001139	1/31/2013	Mercury	None	Ash	Lake Erie Central Basin Shoreline	Ph; Total Suspended Solids
OH	Gallia	Gen J M Gavin	Ohio Power Company	2600	OH0028762	7/31/2013	Boron, Cadmium, Mercury, Selenium	Mercury	Ash & Scrubber	Ohio River Tributaries (Downstream Leading Creek to Upstream Kanawha River)	Arsenic; Boron; Cadmium: Chromium; Cobalt; Copper; Iron; Lead; Mercury; Zinc; Ph; Nickel
OH	Butler	Hamilton Municipal Power Plant	City of Hamilton	75.6	OH0010413	7/31/2014	Mercury	None		Great Miami River (Downstream Fourmile Creek to Mouth)	Fish Consumption Advisory

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OH	Adams	J M Stuart	Dayton Power and Light Company	2440.8	OH0004316	6/30/2007	Cadmium, Mercury, Lead, Boron, Arsenic	None	Ash & Scrubber		
OH	Adams	Killen Station	Dayton Power and Light Company	660.6	OH0060046	1/31/2013	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	None	Ash & Scrubber		
OH	Gallia	Kyger Creek	Ohio Valley Electric Corporation	1086.5	OH0005282	7/31/2013	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Mercury	Ash & Scrubber	Ohio River Tributaries (Downstream Leading Creek to Upstream Kanawha River)	Arsenic; Boron; Cadmium: Chromium; Copper; Iron; Lead; Manganese; Mercury; Molybdeum; Nickel; Selenium; Silver; Zinc; Ph
OH	Cuyahoga	Lake Shore	FirstEnergy Generation Corporation	256	OH0001147	7/31/2016	Mercury	Mercury	Ash	Lake Erie Central Basin Shoreline	Ph; Total Suspended Solids
OH	Hamilton	Miami Fort Generating Station	Duke Energy Ohio, Inc.	1278	OH0009873	7/31/2013	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	None	Ash & Scrubber		
OH	Washington	Muskingum River	Ohio Power Company	1529.4	OH0006149	7/31/2011	Arsenic, Mercury	None	Ash		
OH	Montgomery	O H Hutchings	Dayton Power and Light Company	414	OH0009261	7/31/2014	Mercury, Selenium	Selenium	Ash		
OH	Pickaway	Picway	Ohio Power Company	106.2	OH0005398	6/30/2017	None	None	Ash	Big Walnut Creek	
OH	Jefferson	W H Sammis	FirstEnergy Generation Corporation	2455.6	OH0011525	7/31/2012	Mercury, Selenium, Boron, Cadmium, Lead	None	Ash & Scrubber	Ohio River (Upper North)	Iron
OH	Clermont	W H Zimmer Generating Station	Duke Energy Ohio, Inc.	1425.6	OH0048836	1/31/2015	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Mercury	Scrubber		
OH	Clermont	Walter C Beckjord Generating Station	Duke Energy Ohio, Inc.	1221.3	OH0009865	7/31/2013	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Selenium	Ash	Ohio River Tributaries (Upstream Big Indian Run to Upstream Little Miami River	
OK	Le Flore	AES Shady Point LLC		350	OK0040169	2/29/2016	None	None			
OK	Mayes	Grand River Dam Authority	Grand River Dam Authority	1134	OK0035149	12/31/2014	None	None		Grand Neosho River	
OK	Choctaw	Hugo	Western Farmers Electric Cooperative, Inc.	446	OK0035327	5/31/2013	None	None	Ash	Washita River	Lead; Turbidity
OK	Muskogee	Muskogee	Oklahoma Gas & Electric Company	1716	OK0034657	3/31/2016	None	None	Ash		
OK	Rogers	Northeastern	Public Service Company of Oklahoma	946	OK0034380	12/14/2011	Arsenic, Mercury	None	Ash		
OK	Noble	Sooner	Oklahoma Gas & Electric Company	1138	OK0035068	4/30/2011	None	None	Ash		
PA	Beaver	AES Beaver Valley LLC	AES Corporation	114	PA0218936	5/24/2007	None	None		Wexford Run	Nutrients
PA	Beaver	Bruce Mansfield	FirstEnergy Generation Corporation	2741.1	PA0027481	11/30/2011	None	None	Ash & Scrubber	Hayden Run Creek/ Wexford Run	Nutrients
PA	York	Brunner Island	PPL Generation, LLC	1558.7	PA0008281	9/30/2011	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Lead, Selenium	Ash		
PA	Cambria	Cambria Cogen	Cambria CoGen Company	98	PA0204153	9/30/2012	None	None			
PA	Allegheny	Cheswick	GenOn Power Midwest, LP	637	PA0001627	8/31/2012	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Cadmium, Mercury, Lead, Selenium	Ash & Scrubber	Little Deer Creek	Aluminum; Arsenic; Cadmium; Chronium; Copper; Lead; Iron; Manganese; Mercury; Molybdeum; Selenium; Silver; Thallium; Zinc
PA	Cambria	Colver Power Project	A/C Power - Colver Operations	118	PA0204269	9/19/2000	None	None		Elk Creek	Arsenic; Cadmium; Chronium; Copper; Iron; Mercury; Zinc; Lead
PA	Indiana	Conemaugh	GenOn Northeast Management Company	1872	PA0005011	12/27/2006	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Mercury, Lead, Selenium	Ash & Scrubber		

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PA	Cambria	Ebensburg Power Company	Power Systems Operations, Inc.	57.6	PA0098612	7/31/2011	None	None			
PA	Washington	Elrama	GenOn Power Midwest, LP	510	PA0001571	9/20/2001	None	None	Ash		
PA	Schuylkill	Gilberton Power Company	Broad Mountain Partners	88.4	PA0061697	9/1/2014	None	None		Mill Creek	Arsenic; Cadmium; Chromium; Copper; Iron; Lead; Mercury; Zinc
PA	Greene	Hatfield's Ferry Power Station	Allegheny Energy	1728	PA0002941	12/31/2008	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Mercury, Lead, Selenium	Scrubber		
PA	Indiana	Homer City	NRG Homer City Services LLC	2012	PA0005037	7/31/2012	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Lead, Selenium	Ash & Scrubber		
PA	Armstrong	Keystone	GenOn Northeast Management Company	1872	PA0002062	3/31/2013	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Mercury, Lead, Selenium	Ash & Scrubber		
PA	Washington	Mitchell Power Station	Allegheny Energy	299.2	PA0002895	9/30/1996	Boron	Boron	Ash & Scrubber		
PA	Montour	Montour	PPL Generation, LLC	1641.7	PA0008443	1/31/2013	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Cadmium, Mercury, Selenium	Scrubber		
PA	Lawrence	New Castle	GenOn Power Midwest, LP	348	PA0005061	4/6/2010	None	None	Ash		
PA	Northampton	Northampton Generating Plant	NAES Corporation	114.1	PAR702213	6/2/2015	None	None			
PA	Schuylkill	Northeastern Power Company	Nepco Services Company	59	PA0061417	1/31/2014	None	None			
PA	York	P H Glatfelter Company	P H Glatfelter Company	70.4	PA0008869	6/30/2012	Boron	None			
PA	Clarion	Piney Creek Power Plant	Piney Creek Limited Partnership	36.2	PA0005029	10/31/2017	None	None			
PA	Northampton	Portland	GenOn REMA, LLC	427	PA0012475	7/15/2007	None	None			
PA	Venango	Scrubgrass Generating Plant	Scrubgrass Generating Company	94.7	PA0103713	12/31/2017	None	None		Alleghany River	Mercury
PA	Indiana	Seward	GenOn Wholesale Generation, LP	585	PA0002054	7/18/2015	Arsenic, Mercury, Lead	None		Conemaugh River	Aluminum; Arsenic; Cadmium; Chromium; Cobalt; Copper; Iron; Manganese; Mercury; Nickel; Zinc; Ph
PA	Clearfield	Shawville	GenOn REMA, LLC	626	PA0010031	8/31/2015	None	None		West Branch Susquehanna River	Alumium; Arsenic; Cadmium; Chromium; Copper; Iron; Lead; Manganese; Mercury; Nickel; Zinc
PA	Snyder	Sunbury	Sunbury Generation, LP	437.9	PA0008451	3/31/2012	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash		
PA	Berks	Titus	GenOn REMA, LLC	225	PA0010782	9/30/2015	None	None			
PA	Schuylkill	Wheelabrator - Frackville	Wheelabrator Frackville Energy Company, Inc.	48	PA0061263	9/30/2016	None	None		Mill Creek	Arsenic; Cadmium; Chronium; Copper; Iron; Lead; Mercury; Zinc
PA	Schuylkill	WPS Westwood Generation, LLC	Olympus Power, LLC	36	PA0061344	4/30/2017	None	None		Lower Rausch Creek	Arsenic; Cadmium; Chromium; Copper; Iron; Lead; Mercury; Zinc
SC	Colleton	Canadys Steam	South Carolina Electric & Gas Company	489.6	SC0002020	6/30/2009	Arsenic, Mercury	Arsenic, Mercury	Ash		
SC	Orangeburg	Cope Station	South Carolina Electric & Gas Company	417.3	SC0045772	9/30/2014	Mercury	None	Ash & Scrubber		
SC	Berkeley	Cross	Santee Cooper	2390.1	SC0037401	8/31/2010	Mercury	None	Ash		
SC	Horry	Dolphus M Grainger	Santee Cooper	163.2	SC0001104	9/30/2006	Arsenic	None	Ash	Waccamaw River	
SC	Berkeley	Jefferies	Santee Cooper	345.6	SC0001091	2/29/2008	Arsenic	None	Ash		
SC	Lexington	McMeekin	South Carolina Electric & Gas Company	293.6	SC0002046	4/30/2009	Arsenic	None			

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SC	Aiken	Urquhart	South Carolina Electric & Gas Company	100	SC0000574	9/30/2008	Mercury	None	Ash		
SC	Anderson	W S Lee	Duke Energy Corporation	355	SC0002291	6/30/2013	Arsenic, Cadmium, Mercury, Lead	None	Ash		
SC	Richland	Wateree	South Carolina Electric & Gas Company	771.8	SC0002038	12/31/2012	Arsenic, Mercury	None	Ash		
SC	Berkeley	Williams	South Carolina Generating Company	632.7	SC0003883	5/31/2014	Arsenic, Cadmium, Mercury, Selenium	Arsenic, Selenium	Ash & Scrubber		
SC	Georgetown	Winyah	Santee Cooper	1260	SC0022471	7/31/2011	Arsenic, Selenium	Arsenic, Selenium	Ash		
TN	Shelby	Allen	Tennessee Valley Authority	990	TN0005355	8/3/2010	None	None	Ash	McKellar Lake	Mercury; Nickel; Ph; Total Suspended Solids
TN	Anderson	Bull Run	Tennessee Valley Authority	950	TN0005410	11/1/2013	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash & Scrubber		
TN	Stewart	Cumberland	Tennessee Valley Authority	2600	TN0005789	5/31/2010	Cadmium, Mercury, Lead, Selenium	None	Ash & Scrubber		
TN	Sumner	Gallatin	Tennessee Valley Authority	1255.2	TN0005428	5/31/2017	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash		
TN	Hawkins	John Sevier	Tennessee Valley Authority	800	TN0005436	6/30/2014	Arsenic, Cadmium, Mercury, Lead, Selenium	Arsenic, Selenium	Ash	Cherokee Reservoir	Mercury
TN	Humphreys	Johnsonville	Tennessee Valley Authority	1485.2	TN0005444	11/29/2013	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash		
TN	Roane	Kingston	Tennessee Valley Authority	1700	TN0005452	8/31/2008	None	None	Scrubber	Clinch River Arm of Watts Bar Reservoir	Mercury
TN	Spring City	Watts Bar Fossil	Tennessee Valley Authority	240	TN0005461	8/31/2016	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash		
TX	Freestone	Big Brown	Luminant Generation Company LLC	1186.8	TX0030180	2/1/2012	Selenium	Selenium	Ash		
TX	Goliad	Coleto Creek	Coleto Creek Power, LP	622.4	TX0070068	2/1/2010	None	None	Ash		
TX	Grimes	Gibbons Creek Steam Electric Station	Texas Municipal Power Agency	453.5	TX0074438	5/1/2011	Selenium	Selenium			
TX	Harrison	H W Pirkey Power Plant	Southwestern Electric Power Company	721	TX0087726	4/1/2011	Selenium	Selenium	Ash & Scrubber		
TX	Potter	Harrington Station	Southwestern Public Service Company	1080	TX0124575	10/1/2015	Boron	None			
TX	Bexar	J K Spruce	City of San Antonio	1444	TX0063681	3/1/2015	Selenium	Selenium	Ash & Scrubber		
TX	Bexar	J T Deely	City of San Antonio	932	TX0063681	3/1/2015	Selenium	Selenium	Ash & Scrubber		
TX	Limestone	Limestone	NRG Energy, Inc	1867.2	TX0082651	12/1/2013	Selenium	Selenium	Ash		
TX	Rusk	Martin Lake	Luminant Generation Company LLC	2379.6	TX0054500	4/1/2012	Selenium	Selenium	Ash & Scrubber		
TX	Titus	Monticello	Luminant Generation Company LLC	1980	TX0000086	2/1/2010	Selenium	Selenium	Ash & Scrubber		
TX	Robertson	Oak Grove	Oak Grove Management Company LLC	1795.4	TX0068021	5/1/2014	Selenium	Selenium	Ash & Scrubber		
TX	Wilbarger	Oklaunion Power Station	West Texas Utilities Company	720	TX0087815	12/1/2015	Arsenic, Cadmium, Mercury, Lead, Selenium	Arsenic, Cadmium, Mercury, Lead, Selenium	Ash		
TX	Robertson	Optim Energy Twin Oaks	Optim Energy Twin Oaks LP	349.2	TX0101168	12/1/2013	Selenium	Selenium			
TX	Fayette	Sam Seymour	Lower Colorado River Authority	1690	TX0073121	12/1/2014	Selenium	Selenium	Ash		
TX	Atascosa	San Miguel	San Miguel Electric Cooperative, Inc.	410	TX0090611	5/1/2015	None	None			

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TX	McLennan	Sandy Creek Energy Station	Sandy Creek Energy Associates, LP	900	TX0127256	12/1/2014	None	None			
TX	Fort Bend	W A Parish	NRG Energy, Inc	2736.8	TX0006394	7/1/2014	Selenium	Selenium	Ash		
TX	Titus	Welsh Power Plant	Southwestern Electric Power Company	1674	TX0063215	2/1/2016	Selenium	Selenium	Ash		
UT	Uintah	Bonanza	Deseret Generation & Transmission	499.5	UTU000120	None	None	None			
UT	Carbon	Carbon	Pacificorp Energy Generation	188.6	UT0000094	2/29/2012	None	None			
UT	Emery	Hunter	Pacificorp Energy Generation	1472.2	UTR000446	12/31/2012	None	None			
UT	Emery	Huntington	Pacificorp Energy Generation	996	UT0023604	11/30/2012	None	None		Huntington Creek - 2	Salinity/Total Dissolved Solids/Chlorides
VA	Campbell	Altavista Power Station	Dominion Generation	71.1	VA0083402	9/25/2010	None	None	Scrubber	Roanoke (Staunton) River	Mercury (Fish Consumption Advisory)
VA	King George	Birchwood Power Facility	General Electric Company	258.3	VA0087645	12/7/2014	zero discharge of coal ash	zero discharge of coal ash			
VA	Fluvanna	Bremo Power Station	Dominion Generation	254.2	VA0004138	7/31/2015	None	None	Ash	James River	
VA	Chesapeake (City)	Chesapeake Energy Center	Dominion Generation	649.5	VA0004081	3/19/2017	Arsenic	None	Ash	Elizabeth River	
VA	Chesterfield	Chesterfield Power Station	Dominion Generation	1352.9	VA0004146	12/9/2009	None	None	Ash	Almond Creek	Ph
VA	Russell	Clinch River	Appalachian Power Company	712.5	VA0001015	9/14/2015	None	None	Ash		
VA	Halifax	Clover Power Station	Dominion Generation	848	VA0083097	1/12/2016	None	None	Ash & Scrubber	Roanoke (Staunton) River	Mercury (Fish Consumption Advisory)
VA	Hopewell (City)	Cogentrix-Hopewell	James River Cogeneration Company	114.8	VA0073300	9/30/2017	None	None			
VA	Portsmouth (City)	Cogentrix-Portsmouth	Cogentrix Virginia Leasing Corporation	114.8	VA0074781	9/3/2014	None	None		Unsegmented estuaries in Hampton Roads Harbor	Fish Consumption Advisory
VA	Giles	Glen Lyn	Appalachian Power Company	337.5	VA0000370	7/10/2014	None	None		New River	
VA	Hopewell (City)	Hopewell Power Station	Dominion Generation	71.1	VA0082783	7/10/2010	None	None			
VA	Mecklenburg	Mecklenburg Power Station	Dominion Generation	139.8	VA0084069	12/20/2016	None	None			
VA	Southampton	Southampton Power Station	Dominion Generation	71.1	VA0082767	2/22/2016	None	None			
VA	Richmond (City)	Spruance Genco, LLC	Spruance Genco LLC	229.6	VA0085499	5/23/2011	None	None			
VA	York	Yorktown Power Station	Dominion Generation	375	VA0004103	11/13/2017	Arsenic	None	Ash	York River	
WA	Lewis	Centralia	TransAlta	1459.8	WAR001818	12/31/2014	None	None			
WI	Buffalo	Alma	Dairyland Power Cooperative	181	WI0040223	12/31/2010	Mercury	None		Mississippi River - Chippewa River to Lock and Dam 6	Mercury; Mercury (FCA)
WI	Ashland	Bay Front	Northern States Power (Xcel Energy)	27.2	WI0002887	12/31/2007	Mercury	None			
WI	Boone	Columbia	City of Columbia	1023	WI0002780	9/30/2011	Mercury	None	Ash		
WI	Sheboygan	Edgewater	Wisconsin Power & Light Company	770	WI0001589	9/30/2008	Arsenic, Mercury	None		Lake Michigan	Mercury (Fish Consumption Advisory)
WI	Milwaukee	Elm Road Generating Station	Wisconsin Electric Power Company	1316.3	WI0000914	3/29/2010	Mercury	None		Lake Michigan	Mercury (FCA)
WI	Vernon	Genoa	Dairyland Power Cooperative	345.6	WI0003239	6/30/2013	Mercury	Mercury		Mississippi River - Root River to Wisconsin River	Mercury (Fish Consumption Advisory)
WI	Buffalo	J P Madgett	Dairyland Power Cooperative	387	WI0040223	12/31/2010	Mercury	None	Ash	Mississippi River - Chippewa River to Lock and Dam 6	Mercury (FCA)
WI	Grant	Nelson Dewey	Wisconsin Power & Light Company	200	WI0002381	12/31/2015	None	None	Ash	Mississippi River - Wisconsin River to Lock and Dam 11	Mercury (Fish Consumption Advisory)

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WI	Kenosha	Pleasant Prairie	Wisconsin Electric Power Company	1233	WI0043583	6/30/2009	Arsenic, Mercury	Mercury	Ash & Scrubber	Lake Michigan	Mercury (Fish Consumption Advisory)
WI	Brown	Pulliam	Wisconsin Public Service Corporation	350.2	WI0000965	6/30/2011	Mercury	None		Lake Michigan	Mercury (Fish Consumption Advisory)
WI	Milwaukee	South Oak Creek	Wisconsin Electric Power Company	1191.6	WI0000914	3/29/2010	Mercury	None	Ash	Lake Michigan	Mercury (FCA)
WI	Milwaukee	Valley (WEPCO)	Wisconsin Electric Power Company	272	WI0000931	12/31/1991	Mercury	Mercury	Ash		
WI	Marathon	Weston	Wisconsin Public Service Corporation	1087.1	WI0042765	3/31/2015	Mercury	Mercury	Ash	Wisconsin River - Merril Dam to Prairie Du Sac Dam	Mercury (Fish Consumption Advisory)
WV	Monongalia	Fort Martin Power Station	Monongahela Power Company	1152	WV0004731	6/30/2014	Arsenic, Mercury, Lead, Selenium	None			
WV	Marion	Grant Town Power Plant	Edison Mission Operation & Maintenance	95.7	WV0079235	1/29/2014	Arsenic, Mercury, Selenium	None			
WV	Harrison	Harrison Power Station	Allegheny Energy	2052	WV0005339	6/30/2015	Arsenic, Mercury, Lead, Selenium	None		West Fork River	Iron; Zinc
WV	Putnam	John E Amos	Appalachian Power Company	2932.6	WV0001074	6/6/2012	Arsenic, Mercury, Lead, Selenium	Arsenic, Selenium	Ash & Scrubber	Kanawha River (Lower)	Mercury
WV	Marshall	Kammer	Ohio Power Company	712.5	WV0005291	6/30/2015	None	None		Ohio River (Upper South)	Iron
WV	Kanawha	Kanawha River	Appalachian Power Company	439.2	WV0001066	11/17/2010	None	None	Ash		
WV	Monongalia	Longview Power	Longview Power, LLC	807.5	WV0116238	12/29/2016	None	None			
WV	Marshall	Mitchell	Ohio Power Company	1632.6	WV0005304	6/30/2015	Arsenic, Cadmium, Selenium, Boron	Selenium	Ash	Fish Creek / Ohio River (Upper South)	Mercury; Iron
WV	Monongalia	Morgantown Energy Facility	Morgantown Energy Associates	68.9	WV0078425	5/28/2014	Arsenic, Mercury, Selenium	Arsenic, selenium			
WV	Grant	Mount Storm Power Station	Dominion Generation	1662.4	WV0005525	4/13/2013	Mercury, Selenium	None			
WV	Mason	Mountaineer	Appalachian Power Company	1300	WV0048500	6/30/2013	Arsenic, Mercury	Arsenic	Ash & Scrubber		
WV	Grant	North Branch Power Station	Dominion Generation	80	WV0115321	5/23/2017	Arsenic, Selenium	None			
WV	Mason	Phil Sporn	Appalachian Power Company	1105.5	WV0001058	6/30/2013	Arsenic, Mercury, Selenium	Arsenic, Selenium	Ash		
WV	Pleasants	Pleasants Power Station	Allegheny Energy	1368	WV0023248	12/13/2012	Arsenic, Mercury, Selenium	Selenium		Ohio River (Middle North)	Iron
WY	Converse	Dave Johnston	Pacificorp Energy Generation	816.7	WY0003115	11/30/2014	Cadmium, Lead, Mercury, Selenium	Selenium	Ash & Scrubber		
WY	Sweetwater	Jim Bridger	Pacificorp Energy Generation	2317.7	WYG650015	10/19/2012	None	None			
WY	Lincoln	Naughton	Pacificorp Energy Generation	707.2	WY0020311	7/31/2013	Selenium	None	Ash		
WY	Campbell	Wyodak	Pacificorp Energy Generation	362	WY0001384	9/30/2015	Selenium	None	Ash & Scrubber		

US COAL-FIRED POWER PLANTS DISCHARGING TO WATER IMPAIRED BY As, B, Cd, Hg, Pb or Se

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CO	Adams	Cherokee	Public Service Company of Colorado	676.3	CO0001104	4/30/14	Boron, Cadmium, Mercury, Lead, Selenium	Cadmium, Lead, Selenium	Ash	South Platte River	Cadmium
CO	Pueblo	Comanche	Public Service Company of Colorado	1635.3	CO0000612	10/31/13	None	None		St. Charles River	Selenium
CO	Boulder	Valmont	Public Service Company of Colorado	191.7	CO0001112	10/31/17	Cadmium, Boron, Mercury, Arsenic	None	Ash	Tributaries to St. Vrain Creek	Selenium
FL	Putnam	Seminole	Seminole Electric Cooperative, Inc.	1429.2	FL0036498	8/28/17	Arsenic, Cadmium, Lead, Mercury	Selenium, Lead, Mercury	Scrubber	Rice Creek	Cadmium; Iron; Lead; Nickel; Silver
IA	Woodbury	George Neal North	MidAmerican Energy Company	1046	IA0004103	11/30/16	None	None	Ash	Missouri River	Mercury (Fish Consumption Advisory)
IA	Woodbury	George Neal South	MidAmerican Energy Company	640	IA0061859	3/30/14	None	None	Ash	Missouri River	Mercury (Fish Consumption Advisory)
IL	Sangamon	Dallman	City of Springfield, IL	667.7	IL0024767	12/31/06	Boron	Boron	Ash & Scrubber	Illinois River	Mercury; Silver; Nitorgen; Phosphorus; Total Suspended Solids; Fish Consumption Advisory
IL	Fulton	Duck Creek	Ameren Energy Resources Generating Company	441	IL0055620	2/28/13	Boron, Mercury	Boron	Ash	Illinois River	Silver, Boron, Iron, Mercury
IL	Mason	Havana	Dynegy Midwest Generation Inc.	488	IL0001571	9/30/17	Mercury	None	Ash & Scrubber	Illinois River	Mercury; Silver; Nitorgen; Phosphorus; Total Suspended Solids; Fish Consumption Advisory
IL	Putnam	Hennepin Power Station	Dynegy Midwest Generation Inc.	306.3	IL0001554	4/30/16	Mercury	None	Ash	Illinois River	Mercury (Fish Consumption Advisory)
IL	Will	Joliet 29	Midwest Generation EME, LLC	1320	IL0064254	11/30/00	None	None	Ash	Des Plaines River	Mercury (Fish Consumption Advisory)
IL	Washington	Prairie State Generating Company	Prairie State Generating Company	245	IL0076996	11/30/10	Arsenic, Cadmium, Mercury, Lead, Selenium	None	Ash	Illinois River	Mercury
IN	Posey	A B Brown Generating Station	Southern Indiana Gas and Electric Company	530.4	IN0052191	9/30/16	Arsenic, Boron, Cadmium, Mercury, Selenium	None	Ash	Ohio River - Evansville to Uniontown	Mercury (fish tissue)
IN	Warrick	Alcoa Allowance Management Inc	Alcoa Allowance Management, Inc.	777.6	IN0055051	3/31/91	None	None	Ash & Scrubber	Ohio River - Cannelton to Newburgh	Mercury (fish tissue)
IN	Porter	Bailly Generating Station	Northern Indiana Public Service Company	603.5	IN0000132	7/31/17	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	None	Ash	Lake Michigan Shoreline - Dunes	Mercury
IN	Vermillion	Cayuga	Duke Energy Corporation	1062	IN0002763	7/31/12	Arsenic, Cadmium, Selenium, Mercury	Mercury	Ash	Wabash River	Mercury (fish tissue)
IN	Pike	Frank E Ratts	Hoosier Energy REC, Inc.	233.2	IN0004391	9/30/17	Arsenic, Mercury, Selenium	None	Ash	White River	Mercury (fish tissue)
IN	Morgan	IPL - Eagle Valley Generating Station	Indianapolis Power & Light Company	301.6	IN0004693	9/30/17	Arsenic, Cadmium, Lead, Mercury, Selenium, Boron	None	Ash	White River	Mercury (fish tissue)
IN	Marion	IPL - Harding Street Station (EW Stout)	Indianapolis Power & Light Company	698	IN0004685	9/30/17	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Cadmium, Lead, Mercury (effective Aug. 28, 2015)	Ash & Scrubber	White River	Mercury (fish tissue)
IN	Pike	IPL - Petersburg Generating Station	Indianapolis Power & Light Company	2146.7	IN0002887	9/30/17	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Boron, Cadmium, Lead, Mercury, Selenium (effective Sept. 28, 2015)	Ash & Scrubber	White River	Mercury (fish tissue)
IN	LaPorte	Michigan City Generating Station	Northern Indiana Public Service Company	540	IN0000116	2/29/16	Cadmium, Mercury, Lead	None	Ash	Lake Michigan Shoreline-Dunes	Mercury (Fish Consumption Advisory)
IN	Spencer	Rockport	Indiana Michigan Power Company	2600	IN0051845	11/30/15	Boron, Mercury, Lead, Selenium	Lead, Selenium	Ash & Scrubber	Ohio River - Cannelton to Newburgh	Mercury (fish tissue)
IN	Dearborn	Tanners Creek	Indiana Michigan Power Company	1100.1	IN0002160	5/31/15	Arsenic, Cadmium, Mercury	None	Ash	Ohio River and Tanners Creek	Mercury in fish tissue
IN	Vigo	Wabash River Gen Station	Duke Energy Corporation	860.2	IN0063134	10/31/13	Arsenic, Mercury	None	Ash	Wabash River - Wabash Gen Sta to Lost Creek	Mercury (Fish Consumption Advisory)

US COAL-FIRED POWER PLANTS DISCHARGING TO WATER IMPAIRED BY As, B, Cd, Hg, Pb or Se

STATE	COUNTY	FACILITY NAME	OPERATOR	NAME-PLATE CAPACITY (MW)	NPDES PERMIT ID	PERMIT EXPIRATION DATE	POLLUTANTS MONITORED	POLLUTANTS WITH A LIMIT	COAL ASH OR SCRUBBER OUTFALL?	IMPAIRED WATER	CAUSE OF IMPAIRMENT
KS	Shawnee	Tecumseh Energy Center	Westar Energy, Inc.	232	KS0079731	7/31/17	None	None	Ash	Kansas River	Lead
KY	Hancock	Coleman	Big Rivers Electric Corporation	602	KY0001937	2/28/05	None	None	Ash	Ohio River	Mercury in fish tissue
KY	Mercer	E W Brown	LGE and KU Energy LLC	757.1	KY0002020	2/28/15	None	None	Ash	Herrington Lake	Methylmercury (Fish Consumption Advisory); Ph; Total Suspended Solids
KY	Daviess	Elmer Smith	Owensboro Municipal Utilities	445.3	KY0001295	3/31/05	None	None	Ash & Scrubber	Ohio River (Cannelton to Newburgh)	Mercury (Fish Consumption Advisory)
KY	Pulaski	John S. Cooper	East Kentucky Power Cooperative	344	KY0003611	10/31/13	None	None	Ash & Scrubber	Lake Cumberland	Methylmercury
KY	Woodford	Tyrone	Kentucky Utilities Company	75	KY0001899	1/31/07	None	None	Ash	Kentucky River, 53.2 to 66.95	Methylmercury (Fish Consumption Advisory)
KY	Clark	William C. Dale	East Kentucky Power Cooperative	216	KY0002194	11/30/06	None	None	Ash	Kentucky River, 121.1 to 138.5	Methylmercury (Fish Consumption Advisory)
MA	Hampden	Mount Tom	FirstLight Power Resources	136	MA0005339	9/17/97	None	None	Ash	Connecticut River	Mercury (Fish Consumption Advisory)
MD	Allegany	AES Warrior Run	AES Corporation	229	MD0066079	12/31/17	None	None		Lower North Branch Potomac River	Cadmium; Nickel; Ph; Phosphorus
MI	Muskegon	B C Cobb	Consumers Energy Company	312.6	MI0001520	10/1/13	Mercury	None	Ash	Rivers/ Streams in HUC 040601021004	Mercury (Fish Consumption Advisory)
MI	Ingham	Eckert Station	Lansing Board of Water and Light	375	MI0004464	10/1/12	Mercury	None		Rivers/ Streams in HUC 040500040703	Mercury (Fish Consumption Advisory)
MI	Eaton	Erickson	Lansing Board of Water and Light	154.7	MI0005428	10/1/12	Selenium	None		Rivers/ Streams in HUC 040500040704	Mercury (Fish Consumption Advisory)
MI	Ottawa	J B Sims	Grand Haven Board of Light and Power	80	MI0000728	10/1/15	Mercury, Selenium	None	Ash & Scrubber	Grand River	Mercury; Mercury in fish tissue
MI	Monroe	Monroe	Detroit Edison Company	3279.6	MI0001848	10/1/14	Mercury	Mercury	Ash & Scrubber	Rivers/ Streams in HUC 041000020410	Mercury (Fish Consumption Advisory)
MI	Wayne	River Rouge	Detroit Edison Company	650.6	MI0001724	10/1/12	Boron, Mercury, Selenium	None	Ash	Rivers/ Streams in HUC 040900040407	Mercury (Fish Consumption Advisory)
MT	Yellowstone	J E Corette	P P & L Montana, LLC	172.8	MT0000396	3/1/05	None	None	Ash	Yellowstone River	Arsenic; Nutrients
MT	Richland	Lewis & Clark	Montana Dakota Utilities Company	50	MT0000302	11/30/05	None	None	Ash	Yellowstone River	Chromium, Copper, Lead
NY	Orange	Dynegy Danskammer	Dynegy Power Corporation	386.5	NY0006262	5/31/11	Arsenic, Cadmium, Mercury, Lead, Selenium	Arsenic, Cadmium, Mercury, Lead, Selenium	Ash	Hudson River	Cadmium; PCBS
OH	Lucas	Bay Shore	FirstEnergy Generation Corporation	498.8	OH0002925	7/31/15	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Mercury	Ash	Lake Erie Tributaries (East of Maumee River to West of Toussant River)	Arsenic; Total Suspended Solids; Oil & Grease
OH	Gallia	Gen J M Gavin	Ohio Power Company	2600	OH0028762	7/31/13	Boron, Cadmium, Mercury, Selenium	Mercury	Ash & Scrubber	Ohio River Tributaries (Downstream Leading Creek to Upstream Kanawha River)	Arsenic; Boron; Cadmium: Chromium; Cobalt; Copper; Iron; Lead; Mercury; Zinc; Ph; Nickel
OH	Gallia	Kyger Creek	Ohio Valley Electric Corporation	1086.5	OH0005282	7/31/13	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Mercury	Ash & Scrubber	Ohio River Tributaries (Downstream Leading Creek to Upstream Kanawha River)	Arsenic; Boron; Cadmium: Chromium; Copper; Iron; Lead; Manganese; Mercury; Molybdeum; Nickel; Selenium; Silver; Zinc; Ph
OK	Choctaw	Hugo	Western Farmers Electric Cooperative, Inc.	446	OK0035327	5/31/13	None	None	Ash	Washita River	Lead; Turbidity
PA	Allegheny	Cheswick	GenOn Power Midwest, LP	637	PA0001627	8/31/12	Arsenic, Boron, Cadmium, Mercury, Lead, Selenium	Cadmium, Mercury, Lead, Selenium	Ash & Scrubber	Little Deer Creek	Aluminum; Arsenic; Cadmium; Chronium; Copper; Lead; Iron; Manganese; Mercury; Molybdeum; Selenium; Silver; Thallium; Zinc
PA	Cambria	Colver Power Project	A/C Power - Colver Operations	118	PA0204269	9/19/00	None	None		Elk Creek	Arsenic; Cadmium; Chronium; Copper; Iron; Mercury; Zinc; Lead

US COAL-FIRED POWER PLANTS DISCHARGING TO WATER IMPAIRED BY As, B, Cd, Hg, Pb or Se

STATE	COUNTY	FACILITY NAME	OPERATOR	NAME-PLATE CAPACITY (MW)	NPDES PERMIT ID	PERMIT EXPIRATION DATE	POLLUTANTS MONITORED	POLLUTANTS WITH A LIMIT	COAL ASH OR SCRUBBER OUTFALL?	IMPAIRED WATER	CAUSE OF IMPAIRMENT
PA	Schuylkill	Gilberton Power Company	Broad Mountain Partners	88.4	PA0061697	9/1/14	None	None		Mill Creek	Arsenic; Cadmium; Chromium; Copper; Iron; Lead; Mercury; Zinc
PA	Venango	Scrubgrass Generating Plant	Scrubgrass Generating Company	94.7	PA0103713	12/31/17	None	None		Alleghany River	Mercury
PA	Indiana	Seward	GenOn Wholesale Generation, LP	585	PA0002054	7/18/15	Arsenic, Mercury, Lead	None		Conemaugh River	Aluminum; Arsenic; Cadmium; Chromium; Cobalt; Copper; Iron; Manganese; Mercury; Nickel; Zinc; Ph
PA	Clearfield	Shawville	GenOn REMA, LLC	626	PA0010031	8/31/15	None	None		West Branch Susquehanna River	Alumium; Arsenic; Cadmium; Chromium; Copper; Iron; Lead; Manganese; Mercury; Nickel; Zinc
PA	Schuylkill	Wheelabrator - Frackville	Wheelabrator Frackville Energy Company, Inc.	48	PA0061263	9/30/16	None	None		Mill Creek	Arsenic; Cadmium; Chronium; Copper; Iron; Lead; Mercury; Zinc
PA	Schuylkill	WPS Westwood Generation, LLC	Olympus Power, LLC	36	PA0061344	4/30/17	None	None		Lower Rausch Creek	Arsenic; Cadmium; Chromium; Copper; Iron; Lead; Mercury; Zinc
TN	Shelby	Allen	Tennessee Valley Authority	990	TN0005355	8/3/10	None	None	Ash	McKellar Lake	Mercury; Nickel; Ph; Total Suspended Solids
TN	Hawkins	John Sevier	Tennessee Valley Authority	800	TN0005436	6/30/14	Arsenic, Cadmium, Mercury, Lead, Selenium	Arsenic, Selenium	Ash	Cherokee Reservoir	Mercury
TN	Roane	Kingston	Tennessee Valley Authority	1700	TN0005452	8/31/08	None	None	Scrubber	Clinch River Arm of Watts Bar Reservoir	Mercury
VA	Campbell	Altavista Power Station	Dominion Generation	71.1	VA0083402	9/25/10	None	None	Scrubber	Roanoke (Staunton) River	Mercury (Fish Consumption Advisory)
VA	Halifax	Clover Power Station	Dominion Generation	848	VA0083097	42381	None	None	Ash & Scrubber	Roanoke (Staunton) River	Mercury (Fish Consumption Advisory)
WI	Buffalo	Alma	Dairyland Power Cooperative	181	WI0040223	40543	Mercury	None		Mississippi River - Chippewa River to Lock and Dam 6	Mercury; Mercury (FCA)
WI	Sheboygan	Edgewater	Wisconsin Power & Light Company	770	WI0001589	39721	Arsenic, Mercury	None		Lake Michigan	Mercury (Fish Consumption Advisory)
WI	Milwaukee	Elm Road Generating Station	Wisconsin Electric Power Company	1316.3	WI0000914	40266	Mercury	None		Lake Michigan	Mercury (FCA)
WI	Vernon	Genoa	Dairyland Power Cooperative	345.6	WI0003239	41455	Mercury	Mercury		Mississippi River - Root River to Wisconsin River	Mercury (Fish Consumption Advisory)
WI	Buffalo	J P Madgett	Dairyland Power Cooperative	387	WI0040223	40543	Mercury	None	Ash	Mississippi River - Chippewa River to Lock and Dam 6	Mercury (FCA)
WI	Grant	Nelson Dewey	Wisconsin Power & Light Company	200	WI0002381	42369	None	None	Ash	Mississippi River - Wisconsin River to Lock and Dam 11	Mercury (Fish Consumption Advisory)
WI	Kenosha	Pleasant Prairie	Wisconsin Electric Power Company	1233	WI0043583	39994	Arsenic, Mercury	Mercury	Ash & Scrubber	Lake Michigan	Mercury (Fish Consumption Advisory)
WI	Brown	Pulliam	Wisconsin Public Service Corporation	350.2	WI0000965	40724	Mercury	None		Lake Michigan	Mercury (Fish Consumption Advisory)
WI	Milwaukee	South Oak Creek	Wisconsin Electric Power Company	1191.6	WI0000914	40266	Mercury	None	Ash	Lake Michigan	Mercury (FCA)
WI	Marathon	Weston	Wisconsin Public Service Corporation	1087.1	WI0042765	42094	Mercury	Mercury	Ash	Wisconsin River - Merril Dam to Prairie Du Sac Dam	Mercury (Fish Consumption Advisory)
WV	Putnam	John E Amos	Appalachian Power Company	2932.6	WV0001074	41066	Arsenic, Mercury, Lead, Selenium	Arsenic, Selenium	Ash & Scrubber	Kanawha River (Lower)	Mercury
WV	Marshall	Mitchell	Ohio Power Company	1632.6	WV0005304	42185	Arsenic, Cadmium, Selenium, Boron	Selenium	Ash	Fish Creek / Ohio River (Upper South)	Mercury; Iron