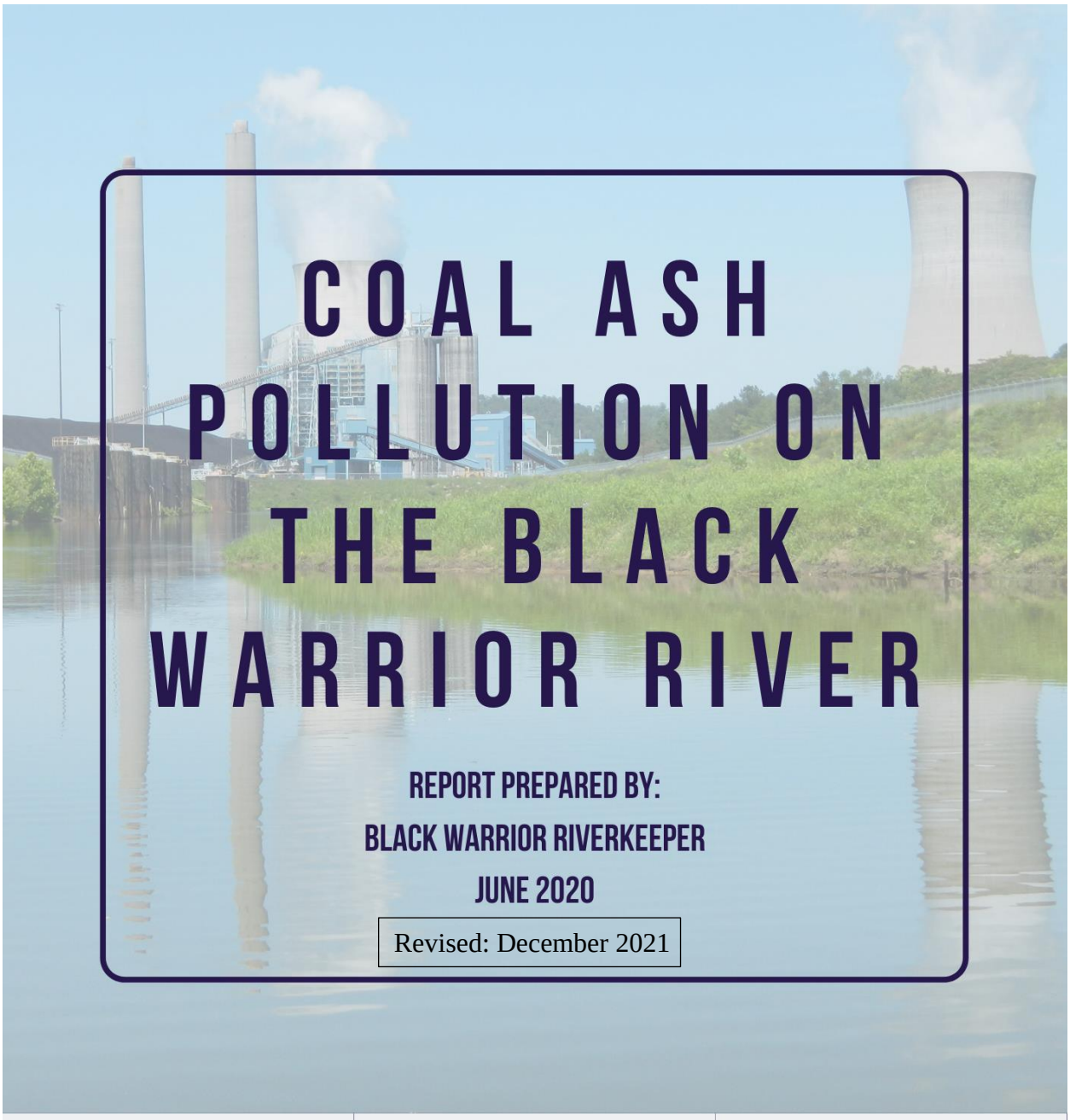

COAL ASH POLLUTION ON THE BLACK WARRIOR RIVER

REPORT PREPARED BY:

BLACK WARRIOR RIVERKEEPER

JUNE 2020

Revised: December 2021

712 37TH ST S,
BIRMINGHAM, AL 35222
(205) 458-0095

Table of Contents

1. Executive Summary

- Coal ash is the toxic waste that remains after coal is burned. For decades, our power plants have disposed of this waste in leaking, unlined ponds or pits alongside our rivers.
- Alabama Power currently maintains three such pits along the banks of the Black Warrior River and its tributaries. The pits contain a total of about 55 million cubic yards of coal ash, or an estimated 55 million tons (110 billion pounds).
- Recent EPA rules require all coal ash pits that don't meet current, minimum safety standards be permanently closed.
- Utility companies have two options to deal with their coal ash pits: excavating the ash for recycling and/or disposal in a lined landfill or leaving it in place and covering it up. Alabama Power has chosen to cover the ash (the "cap-in-place" method) for closing its Black Warrior River coal ash disposal facilities.
- According to Alabama Power's own sampling, all three ash storage facilities on the Black Warrior River are currently contaminating the groundwater beneath them with toxic pollutants. The contaminated groundwater supplies base flow to the river.
- Alabama Power has self-reported exceedances of mandated Groundwater Protection Standards (GWPS) for arsenic, lithium, cobalt and molybdenum at its plants along the Black Warrior River.
- In addition to prolonging groundwater contamination for decades, the power company's cap-in-place closure plans will not eliminate the perpetual threat of catastrophic dam failure at the impoundments, which would have devastating effects on the river and surrounding communities.
- Other utilities in the southeast (e.g., utilities in VA, SC, NC, and GA) have decided to excavate ash from unlined pits, and will either recycle or dispose of it, which are better options for the safety of rivers.
- Alabama Power's three facilities have started, or will soon start, dewatering their ash ponds in preparation for cap-in-place closure. However, dewatering could take several years, and is only the first step on the long road to closure.
- It is not too late to require Alabama Power to excavate its coal ash and recycle it into encapsulated concrete and dispose of it in upland lined landfills away from Alabama's rivers and vulnerable communities. Alabama Power still has the ability to choose this more responsible option, and they should.

2. Introduction

2.1 Black Warrior Riverkeeper's Mission

Black Warrior Riverkeeper's mission is to protect and restore the Black Warrior River and its tributaries. As a membership-based nonprofit and clean water advocacy organization, we are dedicated to improving water quality, habitat, recreation, and public health throughout the Black Warrior River watershed.

Figure 1. Riverkeeper Nelson Brooke preparing to collect samples downstream of Plant Miller

The Black Warrior River drains parts of 17 Alabama counties.[1] The area the river drains, its watershed, covers 6,276 square miles in Alabama and measures roughly 300 miles from top to bottom. The Black Warrior River watershed is home to over 1 million residents and contains 16,145 miles of mapped streams. With thousands of families at risk, we encourage our state's leaders, as well as the general public, to push for coal ash to be recycled into encapsulated concrete or disposed of in upland lined landfills away from rivers and vulnerable communities.

2.2 Alabama Power's Coal Ash Disposal

The unsafe disposal of coal ash in unlined coal ash ponds is a major threat to our river and needs to be better understood by Alabama's residents and public officials. Alabama Power (APCO) is beginning to use the cap-in-place method to permanently close its coal ash ponds. However, this method is unsafe because the ponds are unlined, which allows ongoing contamination of the underlying groundwater and nearby connected streams, rivers, and lakes. The dams containing the ash ponds also pose a perpetual threat of failure that would have

[1]Black Warrior Riverkeeper (2019) *River Facts.* https://blackwarriorriver.org/river-facts/

catastrophic consequences for the river and nearby communities. Time is of the essence to urge our state's leaders to require use of the best cleanup procedures and technologies available to insure that water resources and the public are safeguarded from the long-term impacts of this toxic mess.

APCO stores 100 million tons of toxic coal ash statewide, including 55 million tons in its three ash ponds located along the banks of the Black Warrior River and its tributaries.[2] For decades, APCO has disposed of its coal ash (also known as coal combustion residuals, or CCR) by mixing it with water forming a slurry, and then pumping it into ponds or lakes where the ash can settle out. Millions of gallons of remaining wastewater are discharged per day from each pond into adjacent rivers. Research in recent years has determined that this method of disposal is untenable in most locations, causing contamination of groundwater around the storage ponds and in adjacent waterways.

APCO operates coal ash ponds at each of its power plants in the Black Warrior River watershed: Plant Gorgas, Plant Miller, and Plant Greene County. To view a Google map created by Riverkeeper showing the power plant's locations, click **here**. Additionally, Plant Gorgas has a gypsum pond, where CCR is combined with spent gypsum from the facility's air pollution scrubbers for disposal. Each of these CCR storage facilities is unlined, meaning that there is no protective barrier between the bottom of the ponds and groundwater. APCO's own sampling has shown that toxic contaminants like arsenic and cobalt have migrated from each of these ponds to the groundwater around them.

As a result of the contamination of groundwater and the failure of these obsolete ponds to meet current construction requirements, APCO is required by federal regulation to stop using the ash ponds and close them permanently. APCO has selected cap-in-place as its preferred method of closure, meaning that the water would be drained from the ponds while the coal ash would be consolidated to a smaller footprint and topped with a protective liner. However, this method would not provide for a protective bottom liner, leaving groundwater vulnerable to continued contamination from the toxins residing in the ash. Furthermore, leaving the coal ash in place would not remove the threat of potential catastrophic dam failure. For example, the Kingston, TN coal ash disaster in 2008 resulted in the deaths of at least 30 clean-up workers, and sickness of 250 more, after that utility released 5.4 million cubic yards of coal ash into nearby waterways and buried 300 acres in toxic coal ash sludge.[3] We cannot afford a similar disaster in Alabama.

[2] Mobile Baykeeper (2019) *Alabama's Coal Ash Problem.* *https://www.mobilebaykeeper.org/coalash*

[3] Bruggers, James (2018) Inside Climate News. *A Coal Ash Spill Made These Workers Sick. Now, They're Fighting for Compensation* *https://insideclimatenews.org/news/04122018/toxic-coal-ash-spill-illness-verdict-kingston-tennessee-cleanup-workers-compensation#targetText=Some%2030%20people%20who%20cleaned,USA%20Today%20Network%20in%20Tennessee.*

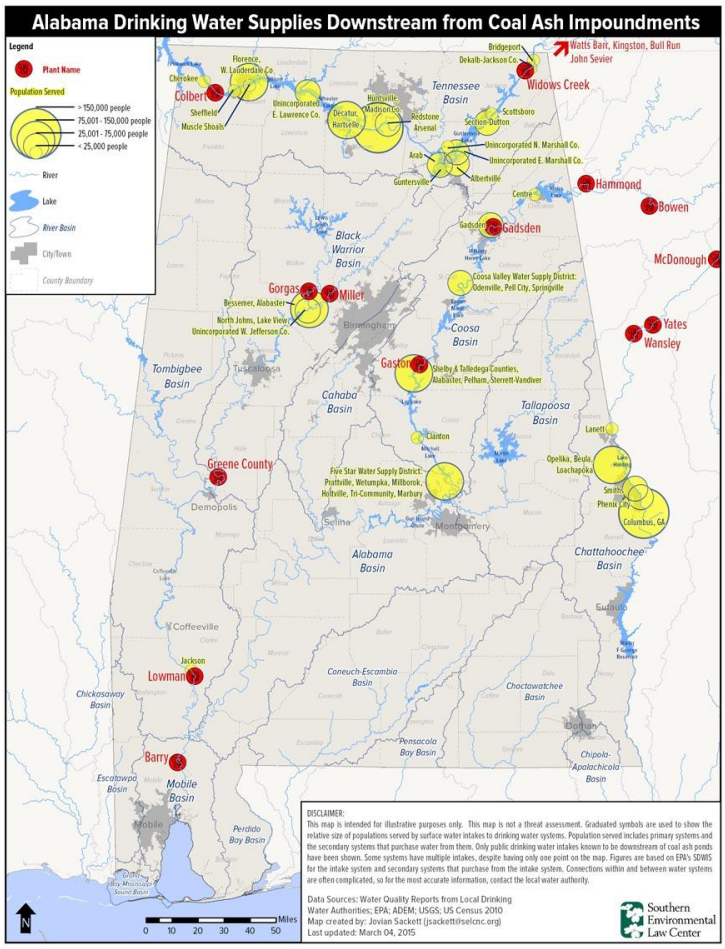

Figure 2. Map of Coal Ash Ponds and Drinking Water Sources in Alabama | Source: SELC

2.3 River Biodiversity and the Economy

The Black Warrior River is one of the crown jewels of Alabama. Its headwaters consist of the beautiful Sipsey, Mulberry, and Locust forks. The river and/or its tributaries flow through Jasper, Cullman, Oneonta, Birmingham, Bessemer, and Tuscaloosa, and are a primary source of drinking water for each of these communities. Groundwater underneath the Black Warrior River watershed also supplies drinking water to countless communities and homes.

Along with providing drinking water, the Black Warrior River watershed is home to hundreds of aquatic species.[4] Specifically, 127 freshwater fish species (4 of which are federally listed as endangered), 36 species of mussels (5 of which are federally listed as endangered), 33 crayfish species, 15 turtle species (1 of which is federally listed as threatened), an endangered salamander, and numerous other aquatic animals can be found in the Black Warrior River watershed. Over 5 of these rare species occur only in the Black Warrior watershed and nowhere

[4] Black Warrior Riverkeeper (2019) *Species.* https://blackwarriorriver.org/species/

else in the world. Alabama's rivers and streams contain more aquatic species than any other state in the U.S. – we are #1 in aquatic biodiversity.

The Black Warrior River also provides Alabama residents with a means of recreation. 55% of Alabama residents engage in some form of recreational activity, including water-based activities such as fishing, boating, canoeing, kayaking, paddleboarding, skiing, swimming, and more.[5] Outdoor recreation is a $14 billion industry in the state of Alabama, directly supporting 135,000 jobs and generating more than $847 million in state and local tax revenue.[6]

Along the Black Warrior River and its tributaries, there are three ash ponds located in Parrish (Plant Gorgas | Mulberry Fork | Walker County), Quinton (Plant Miller | Locust Fork | Jefferson County), and Forkland (Plant Greene County | Black Warrior River | Greene County), Alabama. With a combined acreage of 1,230 acres, these three ash ponds have enough space to fit 931 football fields. These ponds, which are waste storage pits, hold millions of tons of toxic coal ash, and continuously leak heavy metals into groundwater that supplies base flow to the adjacent Black Warrior River and its tributaries. Pollution from these ash ponds threatens not only our wealth of biodiversity, but also the large sector of our economy that depends on this biodiversity and a thriving, clean, natural environment.

3. Background

3.1 What is Coal Ash?

Coal ash is the toxic solid waste that remains after coal is burned. The thermal coal used for electricity generation coal burning power plants, which is mostly made up of carbon atoms, contains many impurities that vary depending on the region where the coal was mined. When burned, the carbon in coal is converted to carbon dioxide gas and emitted into the atmosphere. The impurities in coal, most of which are not readily combustible, are left behind at much higher concentrations in the ash. Across the state, more than 116 million tons of toxic coal ash sits in 9 different pits, not including numerous pits already closed. All of this ash has been stored for decades in onsite landfills or onsite wet storage ash ponds (also referred to as coal ash pits, lagoons, impoundments, or lakes). There are several coal ash pits located adjacent to rivers, which are sources of drinking water for local communities.

[5] Outdoor Industry Association (2017) *OIA Alabama*. *https://outdoorindustry.org/wp-content/uploads/2017/07/OIA_RecEcoState_AL.pdf*

[6] Outdoor Industry Association (2019) *State-Alabama. https://outdoorindustry.org/state/alabama/*

Figure 3. Coal ash waste from power plants is filled with toxic pollutants, which pollute groundwater and the river. (Source: Earthjustice)

When these ash ponds were built many decades ago, there was little public knowledge about or understanding of the toxicity of coal ash. Therefore, these ash ponds were unlined, which allowed harmful pollutants to seep into nearby groundwater and streams for many decades. APCO's own data proves this fact: these ash ponds are actively leaking contaminants (including arsenic, radium, boron, lithium, molybdenum, and cobalt) into groundwater. [7]

Coal ash contains high concentrations of heavy metals, including mercury, arsenic, selenium, and chromium, which are hazardous to human health, wildlife, and waterways. [8] The EPA has found that individuals who live next to an unlined wet ash pond and get drinking water from a well can have as much as a 1 in 50 chance of getting cancer from drinking contaminated water. [9] Having these toxins in our waterways is damaging to the environment and our way of life.

3.2 Excavation vs. Cap-in-Place

On December 19, 2014, the Unites States EPA issued its Final Rule on the Disposal of Coal Combustion Residuals Generated by Electric Utilities under the Resource Conservation and Recovery Act.[10] The rule, which went into effect in October 2015, is widely referred to as the "2015 CCR Rule." While facing scrutiny from industry for being too burdensome and environmental advocates for not going far enough to protect public health and the environment, the EPA's goals in passing the CCR Rule were to protect groundwater from contamination,

[7] Alabama Power Company (2018). *2018 Annual Groundwater Monitoring and Corrective Action Report.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/groundwater-monitoring-and-corrective-action/2018%20Annual%20Groundwater%20Monitoring%20and%20Corrective%20Action%20Report%20-%20Barry%20Ash%20Pond.pdf*

[8] Gottlieb, Barbara et al. (2018) Physicians for Social Responsibility, EarthJustice. *Coal Ash: The Toxic Threat to Our Health and Environment.* *https://www.psr.org/wp-content/uploads/2018/05/coal-ash.pdf*

[9] RTI for USEPA (2007). *Human and Ecological Risk Assessment of Coal Combustion Wastes.* *http://www.southeastcoalash.org/wp-content/uploads/2012/10/epa-coal-combustion-waste-risk-assessment.pdf*

[10] USEPA (2014). *https://www.epa.gov/sites/production/files/2014-12/documents/factsheet_ccrfinal_2.pdf*

lessen the potential for structural failures at CCR impoundments, and reduce the potential for wind-blown dispersal of coal ash contaminants. [11] [12]

In pursuit of these goals, the 2015 CCR Rule requires that any coal ash impoundments that do not meet certain location restrictions, such as being located in a fault zone or within 5 vertical feet of an underlying aquifer, must immediately begin the process of permanent closure.[13] For impoundments required to close under the rule, the EPA prescribes two allowable methods, giving utilities the option to either cap-in-place or excavate its' coal ash waste. Cap-in-place closure means that the water must be removed from the impoundment, with the remaining ash consolidated to a smaller area, where it will remain in perpetuity after it is covered with a mostly impermeable barrier. Closure by excavation also begins with dewatering the existing impoundment. However, excavation means that the coal ash must be removed from where it currently lies and either (1) recycled into construction materials such as concrete, or (2) taken to a dry landfill with a bottom liner that meets the current technological requirements for coal ash disposal.

Cap-in-place is by far the less expensive option for closure, making it the preferred method for many utility companies.[14] However, when cap-in-place is used at unlined coal ash impoundments, contaminants in the buried ash will continue to interact with and leach into groundwater. Furthermore, cap-in-place does not require the removal of existing dams, meaning that any potential future failure of those dams would threaten catastrophic consequences. On the other hand, excavation would require the movement of coal ash by truck, train, or barge to its final resting place, during which there are risks of accidental environmental release.[15] However, excavated ash that is either recycled or buried in a lined landfill poses a much lower risk of contaminating nearby groundwater and surface water. Additionally, the threat of catastrophic, mass release of coal ash like the Tennessee Valley Authority's Kingston, TN disaster would be virtually eliminated. While neither option is perfect or free of risks, excavation is clearly the safer option for the long-term health of the environment as well as public health. Excavation is the option chosen in other southeastern states facing this terrible problem, e.g. VA, SC, NC, and GA.

All three of Alabama Power's coal ash facilities in the Black Warrior River watershed fail to meet the location requirements of the 2015 CCR rule, with all three located less than the minimum 5 feet from groundwater aquifers. As such, all three facilities must be closed. In all

[11] Environmental and Energy Law Program, Harvard Law School (2017). *https://eelp.law.harvard.edu/2017/12/coal-ash-rule/*
[12] USEPA (2017). *https://www.epa.gov/coalash/frequent-questions-about-2015-coal-ash-disposal-rule*
[13] ibid
[14] Bruggers, James. Inside Climate News. (2019). *Coal Ash Is Contaminating Groundwater in at least 22 States, Utility Reports Show. https://insideclimatenews.org/news/16012019/coal-ash-groundwater-contamination-map-arsenic-power-plant-utility-reports*
[15] ibid

three cases, Alabama Power has announced its plans to follow the cap-in-place closure method, in spite of the fact that it poses a greater threat for ongoing and/or catastrophic contamination.[16]

3.3 Coal Ash in the Southeastern U.S.

Virginia, Georgia, North Carolina, and South Carolina are removing a majority (if not all) of their coal ash to upland, lined landfills. There is a plethora of evidence that points to the superiority of excavation as a closure method. For instance, arsenic (and other toxic chemicals) levels dropped by 95-99% when a utility in South Carolina moved its ash to a lined pit away from the river.[17] The reduced levels of coal ash pollution have reduced groundwater pollution, leading to healthier and cleaner rivers. In 2019, Tennessee Valley Authority agreed to remove 12 million tons of coal ash from the unlined pit of its Gallatin Plant, therefore protecting the drinking water for 1.2 million people. Because of the company's choice to value people over profit, the state dropped all fines, thus saving TVA money.

In Georgia, a state where utilities have employed cap-in-place at certain sites, residents who rely on wells have unfortunately been forced to use bottled water to avoid the coal ash contamination in their drinking water. Now, legislation in Georgia is being pushed that would force Georgia Power to excavate and line all of their coal ash ponds in the state. In other words, if legislation passes, Georgia Power will have wasted millions of dollars capping-in-place when the utility could have focused on excavation for recycling and/or deposition in a lined landfill. If Alabama Power excavates coal ash in Alabama, the company can avoid a similar fate.

If removal of coal ash is the best solution for Virginia, Georgia, North Carolina, and South Carolina, why is it not for Alabama? Alabama is beautiful, biodiverse, and resilient. It is important to ensure that all our hardworking people have access to safe and clean water resources for drinking, fishing, recreation, wildlife, and the economy. Alabama Power must show that it values its customers and neighbors over short-sighted profit and convenience. Alabama can be a leader in dealing with its coal ash pollution through proactive excavation for recycling and disposal in an upland, lined landfill.

[16] Alabama Power Company (2020). *https://www.alabamapower.com/our-company/how-we-operate/ccr-rule-compliance-data-and-information.html*

[17] Southern Environmental Law Center (2016). *South Carolina Groundwater Contamination Plummets after Coal Ash Removal. https://www.southernenvironment.org/news-and-press/press-releases/south-carolina-groundwater-contamination-plummets-after-coal-ash-removal*

4. Black Warrior River Coal Ash Disposal

4.1 Plant Greene County Ash Pond Overview

Originally constructed between 1960 and 1965, the ash pond at Plant Greene County currently occupies approximately 489 acres on the banks of the Black Warrior River near Forkland, Alabama.[18] [19] Alabama Power's documents erroneously state that it was constructed on top of wetlands in the South Needham Creek and Coleman Branch watersheds.[20] According to USGS topographic maps, the ash pond was built across Big Slough, and associated wetlands, which flows into Backbone Creek, a tributary of the Black Warrior River. Alabama Power stopped burning coal at Plant Greene County in March of 2016 after converting all of its electric production to natural gas, meaning that the plant is no longer generating new coal ash.[21] However, at last inspection, the ash pond was determined to be filled to its capacity, containing 10,300,000 cubic yards (yd^3) of coal ash.[22]

According to EPA's environmental justice mapping and screening tool, the areas around Plant Greene County have three environmental justice indexes above the 80th percentile.[23] These indexes measure the environmental burden upon the surrounding community; the higher the index score, the greater the burden on the local community. Plant Greene County's score for wastewater discharge concerns is 90.4.

[18] Alabama Power Company (2018). *History of Construction.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-greene-county/ash-pond/design-criteria/History%20of%20Construction%20-%20Ash%20Pond.pdf*

[19] Alabama Power Company (2018). *Closure Plan for Existing CCR Surface Impoundment Plant Greene County Ash Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-greene-county/ash-pond/closure-and-post-closure/Closure%20Plan%20-%20Ash%20Pond.pdf*

[20] *ibid*

[21] Roberson, Anna Catherine (2016). Alabama News Center. *Federal mandates drive Greene County plant's move from coal to gas.* *https://alabamanewscenter.com/2016/09/13/federal-mandates-drive-greene-county-plants-move-from-coal-to-gas/*

[22] Alabama Power Company (2018) *Report of Annual Inspection of CCR Surface Impoundment.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-greene-county/ash-pond/operating-criteria/Report%20of%20Annual%20Inspection%202018%20-%20Ash%20Pond.pdf*

[23] (https://echo.epa.gov/detailed-facility-report?fid=110000608398.

Figure 4. Aerial View of Plant Greene County on the Black Warrior River | Flight by SouthWings.org

Having been constructed over 50 decades ago, the pond at Plant Greene County does not meet the specifications required under current regulations for the proper disposal of coal ash. For instance, the ash pond was constructed without any currently acceptable form of bottom liner, leaving the coal ash and its toxic constituents to leach into groundwater, the average level of which is less than 5 feet below the pond.[24] [25]

[24] Alabama Power Company (2018) *Liner Design Criteria.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-greene-county/ash-pond/design-criteria/Liner%20Design%20Criteria%20-%20Ash%20Pond.pdf*

[25] Alabama Power Company (2018) *Location Restriction Determination.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-greene-county/ash-pond/location-restriction-demonstration/Location%20Restriction%20Demonstration%20-%20Plant%20Greene%20County%20Ash%20Pond.pdf*

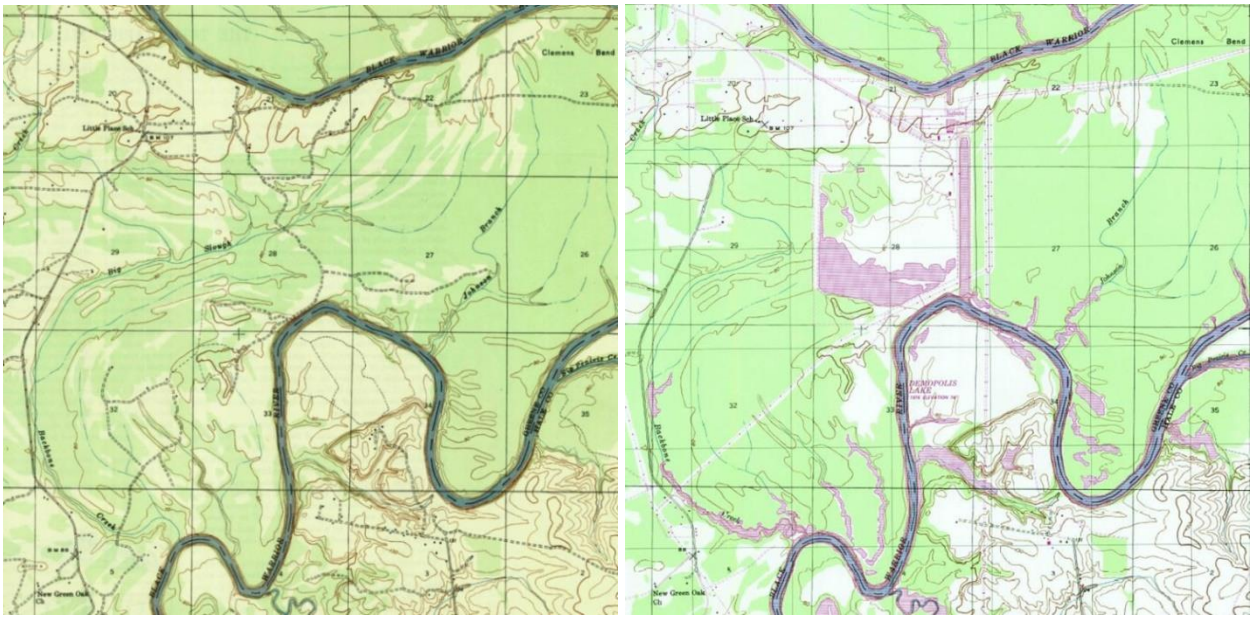

Figure 5. USGS Topographic Maps | 1947 | | Big Slough | Backbone Creek | Black Warrior River | | 1979 |

Wetlands | Backbone Creek | Black Warrior River | 2018 |

A stream named Big Slough was essentially cut in half by the construction of Plant Greene County, its coal ash pond, and its barge canal in the mid-1960s. Big Slough and surrounding wetlands throughout the middle of this large river bend were buried beneath and contaminated by toxic coal ash. Big Slough continues to flow from the West side of the coal ash pond to the southwest into Backbone Creek, which flows into the Black Warrior downriver. The coal ash pond is surrounded by a large earthen dike that contains over fifty years-worth of toxic coal ash waste, now estimated to be 10.3 million tons.

The Black Warrior River has historically received millions of gallons of Alabama Power's coal ash polluted wastewater each day through a wastewater discharge pipe permitted via their ADEM-issued National Pollutant Discharge Elimination System permit AL0002917, which does not include necessary upgrades that comport with current science on river and health protections. Alabama Power's NPDES permit was re-issued by ADEM on March 29, 2019, modified on April 30, 2019, and will expire on March 31, 2024.

Figure 6. Alabama Power's coal ash NPDES wastewater discharge into the Black Warrior River

Figure 7. May 2014 | Orange seeps contaminated with coal ash flowing from ash pond dike along eastern barge canal | Dec. 14

Figure 8. July 2016 | Orange seeps contaminated with coal ash flowing from ash pond dike along eastern barge canal

Figure 9. December 2018 | Orange seeps contaminated with coal ash flowing from ash pond dike along eastern barge canal

Figure 10. May 2019 | Seep flowing from South ash pond dike | Ash pond dewatering wastewater pumping and treatment plant

Capping coal ash in place at Plant Greene County will not erase the very real connection that exists between Alabama Power's toxic coal ash, Big Slough buried underneath it, the wetlands and floodplain it was plopped in the middle of, and the groundwater it is sitting in. All

of this water is flowing and moving constantly, creating an ongoing pathway for continued contamination of groundwater throughout the area, local streams, wetlands, and the lower Black Warrior River.

The deficiencies in the construction of the ash pond at Plant Greene County have damaged the groundwater below and around the pond. Alabama Power's own testing demonstrates that the groundwater is contaminated with arsenic, cobalt, and lithium concentrations that exceed levels deemed safe by the EPA.[26] In fact, arsenic levels in the groundwater at Plant Greene County have been measured at levels up to 7.5 times greater than the acceptable limit determined by EPA.[27] The tables below detail the groundwater violations originating at the ash pond as reported by Alabama Power for calendar years 2018 and 2019.

Plant Greene County Groundwater Protection Standards Exceedances

Annual 2018	Well Number	Analyte	GWPS	Result	Percent Above GWPS
1st Semi-Annual (June)	MW-1	Arsenic	0.006	0.0189	315%
	MW-5	Arsenic	0.006	0.432	7200%
	MW-10	Arsenic	0.006	0.0152	253%
	MW-14	Arsenic	0.006	0.0289	482%
	MW-15	Lithium	0.04	0.547	1368%
	MW-16	Arsenic	0.006	0.0701	1168%
	MW-17	Arsenic	0.006	0.299	4983%
		Lithium	0.04	0.583	1458%
	MW-18	Arsenic	0.006	0.0509	848%
2nd Semi-Annual (November)	MW-1	Arsenic	0.006	0.0195	325%
		Cobalt	0.006	0.0758	1263%
	MW-5	Arsenic	0.006	0.454	7567%
	MW-10	Arsenic	0.006	0.0233	388%
	MW-11	Cobalt	0.006	0.036	600%
	MW-14	Arsenic	0.006	0.0372	620%
	MW-15	Lithium	0.04	0.492	1230%
	MW-16	Arsenic	0.006	0.0648	1080%
	MW-17	Arsenic	0.006	0.382	6367%
		Lithium	0.04	0.531	1328%
	MW-18	Arsenic	0.006	0.0661	1102%

[26] Alabama Power Company (2019). *Notice of Groundwater Protection Standard Exceedance.* https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-greene-county/ash-pond/groundwater-monitoring-and-corrective-action/Notice%20of%20Groundwater%20Protection%20Standard%20Exceedance%20-%20Greene%20County%20Ash%20Pond.pdf

[27] Alabama Power Company (2018). *2018 Annual Groundwater Monitoring and Corrective Action Report.* https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-greene-county/ash-pond/groundwater-monitoring-and-corrective-action/2018%20Annual%20Groundwater%20Monitoring%20and%20Corrective%20Action%20Report%20-%20Plant%20Greene%20County%20Ash%20Pond.pdf

Plant Greene County Groundwater Protection Standards Exceedances					
Annual 2019	**Well Number**	**Analyte**	**GWPS**	**Result**	**Percent Above GWPS**
1st Semi-Annual (March)	MW-1	Arsenic	0.01	0.0267	267%
		Cobalt	0.0167	0.176	1054%
	MW-2	Arsenic	0.01	0.0101	101%
	MW-5	Arsenic	0.01	0.455	4550%
		Lithium	0.04	0.0988	247%
	MW-8	Lithium	0.04	0.0537	134%
	MW-9	Lithium	0.04	0.0931	233%
	MW-10	Arsenic	0.01	0.014	140%
		Lithium	0.04	0.115	288%
	MW-11	Cobalt	0.0167	0.0292	175%
		Lithium	0.04	0.119	298%
	MW-12	Lithium	0.04	0.0532	133%
		Molybdenum	0.1	0.11	110%
	MW-13	Lithium	0.04	0.123	308%
	MW-14	Arsenic	0.01	0.0264	264%
		Cobalt	0.0167	0.0303	181%
		Lithium	0.04	1.11	2775%
	MW-15	Cobalt	0.0167	0.0184	110%
		Lithium	0.04	0.57	1425%
	MW-16	Arsenic	0.01	0.0952	952%
		Cobalt	0.0167	0.0177	106%
		Lithium	0.04	0.558	1395%
	MW-17	Arsenic	0.01	0.32	3200%
		Cobalt	0.0167	0.0192	115%
		Lithium	0.04	0.595	1488%
	MW-18	Arsenic	0.01	0.0477	477%
		Lithium	0.04	0.378	945%
	MW-21	Lithium	0.04	0.0531	133%
2nd Semi-Annual (September)	MW-1	Arsenic	0.01	0.0226	226%
	MW-2	Arsenic	0.01	0.022	220%
	MW-5	Arsenic	0.01	0.406	4060%
		Lithium	0.04	0.117	293%
	MW-8	Lithium	0.04	0.0982	246%
	MW-9	Arsenic	0.01	0.0108	108%
		Cobalt	0.0167	0.0177	106%
		Lithium	0.04	0.128	320%
	MW-10	Arsenic	0.01	0.0132	132%
		Cobalt	0.0167	0.0191	114%
		Lithium	0.04	0.112	280%
	MW-11	Cobalt	0.0167	0.02	120%
		Lithium	0.04	0.124	310%
	MW-12	Lithium	0.04	0.0598	150%
		Molybdenum	0.1	0.134	134%
	MW-13	Lithium	0.04	0.246	615%
		Thallium	0.002	0.00214	107%
	MW-14	Arsenic	0.01	0.0263	263%
		Cobalt	0.0167	0.0278	166%
		Lithium	0.04	0.765	1913%
	MW-15	Cobalt	0.0167	0.0201	120%
		Lithium	0.04	0.6	1500%
	MW-16	Arsenic	0.01	0.0786	786%
		Lithium	0.04	0.581	1453%
	MW-17	Arsenic	0.01	0.356	3560%
		Lithium	0.04	0.571	1428%
	MW-18	Arsenic	0.01	0.0498	498%
		Cobalt	0.0167	0.0174	104%
		Lithium	0.04	0.408	1020%
	MW-21	Lithium	0.04	0.0862	216%

Figure 11. Greene County Coal Ash Groundwater Violations

Because of the groundwater contamination, Alabama Power is being forced to permanently close the ash pond. APCO has selected to close the pond using cap-in-place. For Plant Greene County, APCO plans to remove and treat the water in the pond (a process known as "dewatering"), consolidate the waste ash to a final footprint of approximately 250 acres, and then cover the ash with an impermeable liner.[28] Alabama Power began the first step of dewatering the pond on or about April 8, 2019 with final closure of the pond expected sometime in 2024.[29] [30] Even after final pond closure, the remaining ash will continue to be located in close proximity to the underlying aquifer and will still not have a bottom liner to prevent further contamination of groundwater.

Figure 12. Aerial view of Plant Greene County's ash pond | Flight by SouthWings.org

Because of groundwater contamination caused by the unlined ash pond at Plant Greene County, the Alabama Department of Environmental Management (ADEM) levied a $250,000

[28] Alabama Power Company (2017). *Closure Plan for Existing CCR Surface Impoundment.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-greene-county/ash-pond/closure-and-post-closure/Greene%20County%20Amended%20Closure%20Plan%20REV1%20April%202020.pdf*

[29] 4/5/2019 Letter from Alabama Power to Alabama Department of Environmental Management *Re: Commencement of Dewatering Activities*

[30] According to the Alabama Department of Environmental Management's "eFile" system, APCO had two toxicity test failures in June and September 2019 at Greene and had to suspend dewatering through the end of 2019. ADEM issued a Notice of Violation to APCO for the toxicity failures. http://app.adem.alabama.gov/eFile/.

fine against Alabama Power in a March 2018 Administrative Order.[31] The Administrative Order (as well as federal regulations) also required APCO to undertake an Assessment of Corrective Measures, or an engineering report to detail potential methods that could be employed to remediate the groundwater. APCO's Assessment of Corrective Measures for Plant Greene County was filed with ADEM on July 11, 2019. In that document, APCO proposes to address the groundwater contamination by a process known as "monitored natural attenuation," and plans to prevent the continued migration of contaminated groundwater to the nearby Black Warrior River by constructing a barrier wall that will extend into the relatively impermeable layer of chalk soils below the ground.[32] The selected remedy of monitored natural attenuation really means that, aside from the previously planned closure activities and the barrier wall construction, APCO does not plan to actively treat or remediate groundwater. Monitored natural attenuation (MNA) means that APCO will continue to monitor groundwater through chemical analysis of samples while allowing natural chemical and physical processes in the subsurface environment to remove, dilute, or immobilize the contaminants.[33] The Assessment of Corrective Measures notes that the process of MNA could take more than *two decades* after final closure to reduce contaminants in groundwater to levels that meet national standards, meaning, according to APCO, that the groundwater may not be safe until 2045 or beyond.[34] However, MNA through cap-in-place does not work for coal ash that sits in water and continually discharges into state waters, as is the case at Plant Greene. This is especially true for dangerous inorganics like arsenic and lithium. *See* November 14, 2019 Letter from ADEM's Heather M. Jones to APCO's Dustin Brooks at 7. Moreover, MNA requires that an aquifer have sufficient capacity for that attenuation to take place. *Id.* Evidently, Alabama Power has yet to demonstrate how monitored natural attenuation will work on the inorganics present, evaluate whether it is a feasible remedy based upon site specific conditions at Plant Greene County or even analyzed whether the aquifer has sufficient capacity for attenuation to take place. *Id.*

Using cap-in-place to close the ash pond at Greene fails to remove the threat of a potential catastrophic dam failure. 10.3 million yards of coal ash are stored along the banks of the Black Warrior River at Plant Greene County. Improper maintenance or the possibility of natural disasters damaging the dike system could result in a dam breach or failure and release massive quantities of toxic coal ash into the river. Under federal regulations, the ash pond at Plant Greene County was assessed with a Significant Hazard Potential classification, meaning that a dam/dike failure or improper operation of the facility would likely result in significant

[31] Pillion, Dennis (2018). AL.com. *Alabama Power fined $1.25 million over coal ash ponds.* *https://www.al.com/news/birmingham/2018/03/alabama_power_fined_coal_ash.html*
[32] Alabama Power Company (2019). *Assessment of Corrective Measures Greene County Ash Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-greene-county/ash-pond/groundwater-monitoring-and-corrective-action/Assessment%20of%20Corrective%20Measures%20Greene%20County%20Ash%20Pond.pdf*
[33] ibid
[34] ibid

economic loss or environmental damage.[35] The map below depicts that area that could be flooded with coal ash and contaminated water under current conditions at the pond in the event of such a catastrophe.

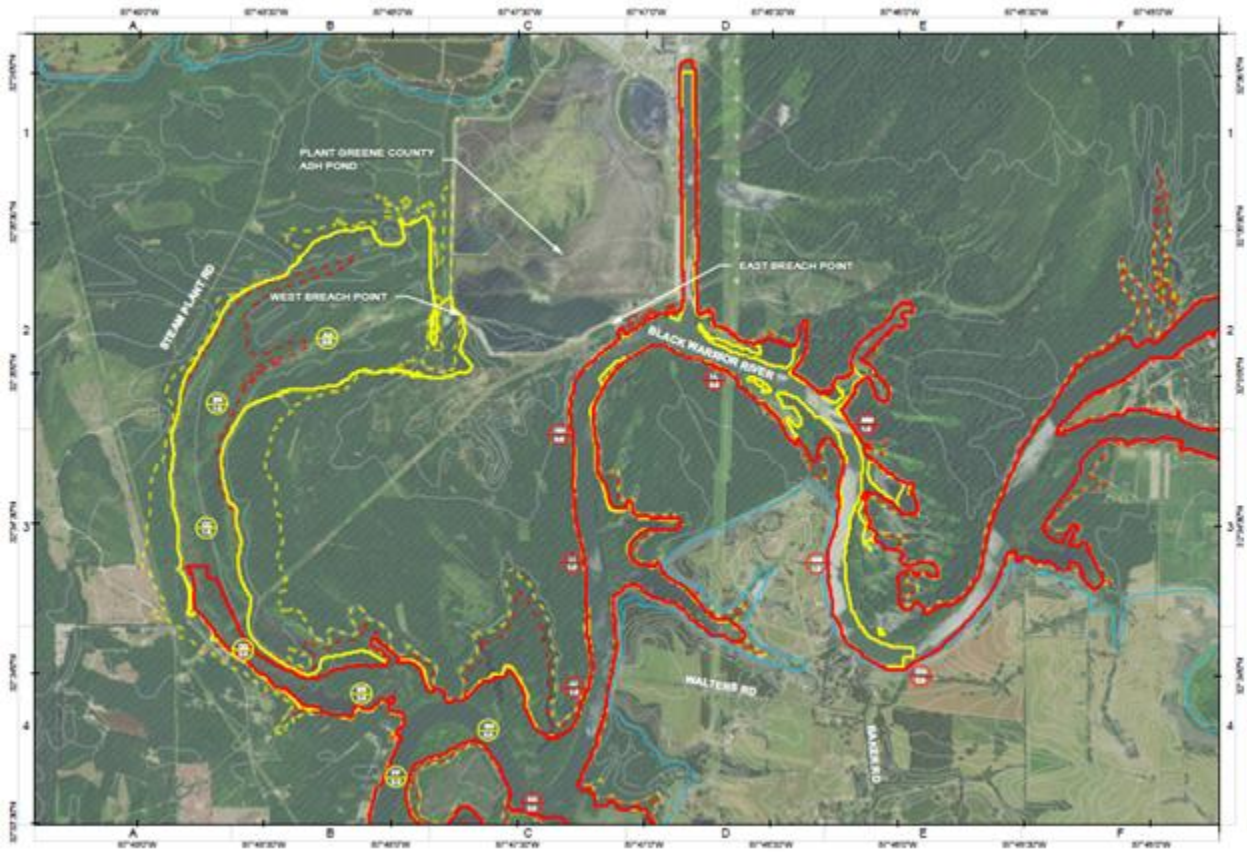

Figure 13. Map Depicting Area Potentially Inundated in the Event of Dam Failure at Plant Greene County | Source: Alabama Power Company (2017). *CCR Impoundment Emergency Action Plan Plant Greene County*

4.2 Plant Miller Ash Pond Overview

The coal ash pond at Plant Miller was originally constructed in the late 1970s.[36] The primary dike impounding the CCR disposal facility stands at 170 feet tall and 3,300 feet long, or about 0.625 miles, creating a pond that occupies approximately 321 acres.[37] Located near

[35] Alabama Power Company (2017). *CCR Impoundment Emergency Action Plan Plant Greene County.* https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-greene-county/ash-pond/design-criteria/Emergency%20Action%20Plan%20-%20Ash%20Pond.pdf

[36] Alabama Power Company (2018). *History of Construction for Existing CCR Surface Impoundment Miller Steam Plant Ash Pond.* https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-miller/ash-pond/design-criteria/History%20of%20Construction%20-%20Ash%20Pond.pdf

[37] Alabama Power Company (2018). *Closure Plan for Existing CCR Surface Impoundment.* https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-

Quinton, AL, Alabama Power built the Plant Miller Ash Pond on the bank of the Locust Fork of the Black Warrior River. Constructed to contain a maximum of 22,000,000 yd^3 of coal ash, the pond now holds more than 18,500,000 yd^3, and discharges wastewater at a rate of approximately 11.5 million gallons per day (MGD). [38]

Figure 14. Aerial view of Plant Miller, with coal ash pond in foreground | Flight by SouthWings.org

Much like the pond at Plant Greene County, the CCR disposal facility at Plant Miller was constructed prior to modern regulations and does not meet current regulatory safety requirements. The pond does not have a bottom liner to prevent toxic coal ash leachate from contaminating the underlying water table, which is located less than 5 vertical feet from the base of the bottom of the pond. [39] [40]

---

miller/ash-pond/closure-and-post-closure/Miller%20Amended%20Closure%20Plan%20REV1%20April%202020.pdf

[38] Alabama Power Company (2018). *Report of Annual Inspection of CCR Surface Impoundment.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-miller/ash-pond/operating-criteria/Report%20of%20Annual%20Inspection%202019%20-%20Ash%20Pond.pdf*

[39] Alabama Power Company (2018). *Liner Design Criteria.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-miller/ash-pond/design-criteria/Liner%20Design%20Criteria%20-%20Ash%20Pond.pdf*

[40] Alabama Power Company (2018). *Location Restriction Demonstration.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-miller/ash-pond/location-restriction-demonstration/Location%20Restriction%20Demonstration%20-%20Plant%20Miller%20Ash%20Pond.pdf*

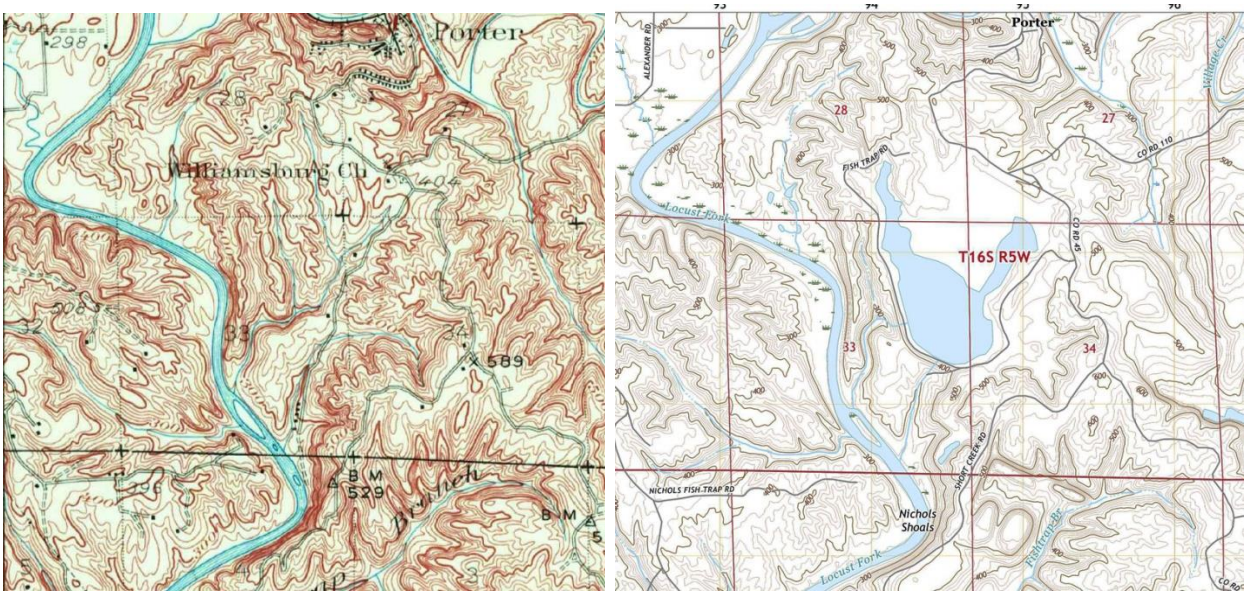

Figure 15. USGS Topographic Maps | 1938 | | Unnamed Tributaries of the Locust Fork | | 2018 |

Two unnamed tributaries (UTs) to the Locust Fork of the Black Warrior River were partially buried when Alabama Power constructed its coal ash pond at Plant Miller in the late 1970s. The West UT's three headwater streams were buried beneath the toxic coal ash waste repository and the South UT's headwater reaches were also buried. Essentially, the upper half of each stream's watershed was buried by Alabama Power's coal ash. Both streams were filled with large dams made of clay, soil, and rock fill. The West UT's cross-valley dam is massive, approximately 170 ft. tall at its highest point, and over 3,300 ft. long. It connects to a large earthen dike that flanks the southwest side of the ash pond. This dike holds back the ponded water along the entire western side of the ash pond and all of the 18.5 million tons of toxic ash deposited there since the 1970s, which looms over the remaining lower reaches of the UTs and the Locust Fork below.

The West UT receives millions of gallons of Alabama Power's coal ash polluted water each day through a wastewater discharge permitted via their ADEM-issued National Pollutant Discharge Elimination System permit AL0027146, which does not include necessary upgrades that comport with current science on river and health protections. Alabama Power's NPDES permit was re-issued by ADEM on July 7, 2021 and will expire on June 30, 2026.

Figure 16. Wastewater from the ash pond's NPDES discharge pipe cascades like a waterfall down into the tributary below, and then flows directly into the Locust Fork

Figure 17. The West UT also receives large volumes of polluted water that flow and seep from underneath the coal ash pond's West dam and dike system

Capping coal ash in place at Plant Miller will not erase the very real connection that exists between Alabama Power's toxic coal ash, the two streams buried underneath it, and the groundwater it is sitting in. All of this water is flowing and moving constantly, creating an ongoing pathway for continued contamination of groundwater throughout the area, local streams, and the Locust Fork.

These fundamental deficiencies in the facility construction have led to significant contamination of groundwater in the area surrounding the pond. For example, testing performed by Alabama Power has detected levels of arsenic, cobalt, and lithium that exceed the EPA's

groundwater protection standards (GWPS), resulting in $250,000 in fines by ADEM.[41] The tables below provide more information on the extent of groundwater contamination at Plant Miller as reported by Alabama Power for calendar years 2019 and 2020.

Plant Miller Groundwater Protection Standards Exceedances					
Annual 2019	Well Number	Analyte	GWPS	Result	Percent Above GWPS
1st Semi-Annual (April-May)	MW-1	Lithium	0.04	0.104	260%
	MW-2	Cobalt	0.006	0.0642	1070%
	MW-2	Lithium	0.04	0.228	570%
	MW-3D	Arsenic	0.01	0.0108	108%
	MW-3D	Lithium	0.04	0.104	260%
	MW-3S	Lithium	0.04	0.243	608%
	MW-4	Cobalt	0.006	0.0206	343%
	MW-4	Lithium	0.04	0.0729	182%
	MW-5	Arsenic	0.01	0.0122	122%
	MW-5	Lithium	0.04	0.229	573%
	PZ-5	Lithium	0.04	0.134	335%
	MW-6	Cobalt	0.006	0.0471	785%
	MW-6	Lithium	0.04	0.0822	206%
	MW-7D	Lithium	0.04	0.0996	249%
	MW-7S	Lithium	0.04	0.148	370%
	MW-8D	Lithium	0.04	0.0568	142%
	MW-9D	Cobalt	0.006	0.0207	345%
	MW-9D	Lithium	0.04	0.0724	181%
	MW-9S	Lithium	0.04	0.142	355%
	MW-10	Lithium	0.04	0.186	465%
	MW-10	Molybdenum	0.1	0.121	121%
	MW-11	Lithium	0.04	0.327	818%
	MW-13S	Cobalt	0.006	0.0237	395%
	MW-13S	Lithium	0.04	0.0788	197%
2nd Semi-Annual (August)	MW-1	Lithium	0.04	0.264	660%
	MW-2	Cobalt	0.006	0.0498	830%
	MW-2	Lithium	0.04	0.257	643%
	MW-3D	Arsenic	0.01	0.0111	111%
	MW-3D	Lithium	0.04	0.115	288%
	MW-3S	Lithium	0.04	0.246	615%
	MW-4	Cobalt	0.006	0.0157	262%
	MW-4	Lithium	0.04	0.0741	185%
	MW-5	Arsenic	0.01	0.0107	107%
	MW-5	Lithium	0.04	0.237	593%
	PZ-5	Lithium	0.04	0.164	410%
	MW-6	Cobalt	0.006	0.0283	472%
	MW-6	Lithium	0.04	0.0853	213%
	MW-7D	Lithium	0.04	0.111	278%
	MW-7S	Lithium	0.04	0.158	395%
	MW-8D	Cobalt	0.006	0.00697	116%
	MW-8D	Lithium	0.04	0.0615	154%
	MW-9D	Cobalt	0.006	0.0198	330%
	MW-9D	Lithium	0.04	0.0801	200%
	MW-9S	Lithium	0.04	0.138	345%
	MW-10	Lithium	0.04	0.197	493%
	MW-10	Molybdenum	0.1	0.158	158%
	MW-11	Lithium	0.04	0.318	795%
	MW-12	Lithium	0.04	0.158	395%
	MW-12	Molybdenum	0.1	0.646	646%
	MW-13S	Cobalt	0.006	0.0228	380%
	MW-13S	Lithium	0.04	0.0845	211%
	MW-16	Lithium	0.04	0.0555	139%
	MW-16	Molybdenum	0.1	0.107	107%

[41] Alabama Power Company (2018). *Notice of Groundwater Protection Standard Exceedance Plant Miller Ash Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-miller/ash-pond/groundwater-monitoring-and-corrective-action/Notice%20of%20Groundwater%20Protection%20Standard%20Exceedance%20-%20Miller%20Ash%20Pond.pdf*

Plant Miller Groundwater Protection Standards Exceedances					
Annual 2020	Well Number	Analyte	GWPS	Result	Percent Above GWPS
1st Semi-Annual (March-April)	MW-1	Lithium	0.04	0.123	308%
	MW-2	Cobalt	0.006	0.0471	785%
	MW-2	Lithium	0.04	0.269	673%
	MW-3D	Arsenic	0.01	0.0118	118%
	MW-3D	Lithium	0.04	0.11	275%
	MW-3S	Lithium	0.04	0.294	735%
	MW-4	Cobalt	0.006	0.0119	198%
	MW-4	Lithium	0.04	0.0851	213%
	MW-5	Arsenic	0.01	0.0122	122%
	MW-5	Lithium	0.04	0.237	593%
	MW-6	Cobalt	0.006	0.0186	310%
	MW-6	Lithium	0.04	0.0877	219%
	MW-06V	Arsenic	0.01	0.0236	236%
	MW-06V	Lithium	0.04	0.104	260%
	MW-7D	Lithium	0.04	0.109	273%
	MW-7S	Lithium	0.04	0.158	395%
	MW-8D	Cobalt	0.006	0.007	117%
	MW-8D	Lithium	0.04	0.0672	168%
	MW-9D	Cobalt	0.006	0.0203	338%
	MW-9D	Lithium	0.04	0.0802	201%
	MW-9S	Lithium	0.04	0.117	293%
	MW-10	Lithium	0.04	0.225	563%
	MW-10	Molybdenum	0.1	0.223	223%
	MW-11	Lithium	0.04	0.255	638%
	MW-12	Lithium	0.04	0.146	365%
	MW-12	Molybdenum	0.1	0.49	490%
	MW-13S	Cobalt	0.006	0.0244	407%
	MW-13S	Lithium	0.04	0.0871	218%
	MW-17V	Lithium	0.04	0.0646	162%
	MW-17H	Lithium	0.04	0.0566	142%
	MW-18H	Lithium	0.04	0.0875	219%
	MW19HA	Lithium	0.04	0.138	345%
	MW-20H	Lithium	0.04	0.277	693%
	MW-20HS	Lithium	0.04	0.094	235%
	MW-23	Barium	2	11	550%
	MW-23	Barium	2	11.6	580%
	MW-23	Lithium	0.04	1.18	2950%
	MW-23	Lithium	0.04	1.05	2625%
	MW-28H	Lithium	0.04	0.0593	148%
	MW-30H	Lithium	0.04	0.0821	205%
	MW-33H	Cobalt	0.006	0.00965	161%
	MW-33H	Lithium	0.04	0.145	363%
	MW-34H	Lithium	0.04	0.164	410%
	MW-35H	Arsenic	0.01	0.0139	139%
	MW-37H	Arsenic	0.01	0.113	1130%
	MW-37H	Lithium	0.04	0.0662	166%
2nd Semi-Annual (October)	MW-1	Lithium	0.04	0.09	225%
	MW-2	Cobalt	0.006	0.0368	613%
	MW-2	Lithium	0.04	0.217	543%
	MW-3D	Arsenic	0.01	0.015	150%
	MW-3D	Lithium	0.04	0.121	303%
	MW-3S	Lithium	0.04	0.347	868%
	MW-4	Lithium	0.04	0.0651	163%
	MW-4V	Lithium	0.04	0.601	1503%
	MW-5	Arsenic	0.01	0.0145	145%
	MW-5	Lithium	0.04	0.193	483%
	PZ-5	Lithium	0.04	0.127	318%
	MW-6	Cobalt	0.006	0.00675	113%
	MW-6	Lithium	0.04	0.0785	196%
	MW-6V	Lithium	0.04	0.0971	243%
	MW-7DR	Lithium	0.04	0.12	300%
	MW-7SR	Lithium	0.04	0.143	358%
	MW-9DR	Lithium	0.04	0.0815	204%
	MW-10	Lithium	0.04	0.166	415%
	MW-10	Molybdenum	0.1	0.305	305%
	MW-11	Lithium	0.04	0.297	743%
	MW-12	Lithium	0.04	0.12	300%
	MW-12	Molybdenum	0.1	0.858	858%
	MW-13SR	Cobalt	0.006	0.0112	187%
	MW-16	Lithium	0.04	0.132	330%
	MW-17H	Lithium	0.04	0.0845	211%
	MW-17V	Lithium	0.04	0.0574	144%
	MW-18H	Lithium	0.04	0.215	538%
	MW-19HA	Lithium	0.04	0.173	433%
	MW-20H	Lithium	0.04	0.245	613%
	MW-20HS	Lithium	0.04	0.0797	199%
	MW-22D	Barium	2	4.33	217%
	MW-22D	Lithium	0.04	0.344	860%
	MW-22I	Lithium	0.04	0.141	353%
	MW-22S	Lithium	0.04	0.172	430%
	MW-23	Barium	2	12.4	620%
	MW-23	Lithium	0.04	1.2	3000%
	MW-23A	Barium	2	9.8	490%
	MW-23A	Lithium	0.04	1.117	2793%
	MW-27HR	Lithium	0.04	0.0427	107%
	MW-28H	Lithium	0.04	0.058	145%
	MW-30H	Lithium	0.04	0.0918	230%
	MW-31H	Lithium	0.04	0.135	338%
	MW-33H	Cobalt	0.006	0.0121	202%
	MW-33H	Lithium	0.04	0.155	388%
	MW-34H	Lithium	0.04	0.156	390%
	MW-35H	Arsenic	0.01	0.0146	146%
	MW-36HR	Lithium	0.04	0.161	403%
	MW-37H	Lithium	0.04	0.0635	159%

Figure 18. Miller Coal Ash Groundwater Violations

Due to groundwater contamination, federal regulations require APCO to permanently close the CCR disposal facility. Under the current plan, APCO anticipated beginning the process of dewatering in 2019 (though to the best of our knowledge, they have not yet been granted a permit to do so) and will begin the process of consolidating remaining ash to a final footprint of approximately 200 acres in 2021, a process that will take an estimated 6 years. Final closure of the pond is expected to be finished in 2029. While APCO plans to cover the top of the consolidated coal ash with an impermeable liner, the toxic contaminants in the ash will continue to leach out into the surrounding aquifer because APCO does not plan to install a bottom liner.

Figure 19. Aerial view of Plant Miller's coal ash pond above the Locust Fork | Flight by SouthWings.org

In addition to closing the pond, federal regulations and the 2018 Administrative Order from ADEM have required Alabama Power to conduct an Assessment of Corrective Measures (ACM) to remediate the groundwater contamination caused by decades of improper disposal of CCR materials at Plant Miller. That document was filed with ADEM in July of 2019. Beyond the closure plans to consolidate and cap the millions of tons of coal ash, the only action proposed by APCO to remedy groundwater contamination is (again) monitored natural attenuation, or MNA.[42] MNA refers to the practice of taking no proactive measures, but rather continuing to

[42] Alabama Power Company (2019). *Assessment of Corrective Measures Plant Miller Ash Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-miller/ash-pond/groundwater-monitoring-and-corrective-action/Assessment%20of%20Corrective%20Measures%20Plant%20Miller%20Ash%20Pond.pdf*

sample and monitor groundwater while allowing natural processes to remove or bind contaminants. While Alabama Power admits in its ACM that there is not enough scientific research to accurately estimate the amount of time it will take for MNA to reduce arsenic, lithium and cobalt in the groundwater, they believe that it will take at least 30 years after final closure of the pond, or at least 3 decades from now before the contaminants return to levels that meet groundwater protection standards. However, MNA through cap-in-place does not work for coal ash that sits in water and continually discharges into state waters, as is the case at Plant Miller. This is especially true for dangerous inorganics like arsenic and lithium. *See* November 14, 2019 Letter from ADEM's Heather M. Jones to APCO's Dustin Brooks at 7. Moreover, MNA requires that an aquifer have sufficient capacity for that attenuation to take place. *Id.* Evidently, Alabama Power has yet to demonstrate how monitored natural attenuation will work on the inorganics present, evaluate whether it is a feasible remedy based upon site specific conditions at Plant Miller or even analyzed whether the aquifer has sufficient capacity for attenuation to take place. *Id.*

As we have discussed at Plant Greene County, neither cap-in-place closure nor the proposed actions under the Assessment of Corrective Measures will address the ongoing threat of catastrophic failure of the dam/dike at Plant Miller. Evaluation of the dam at Plant Miller's ash pond and the potential consequences of its failure resulted in the same classification give for the dam at Plant Greene County, Significant Hazard Potential.[43] The map below depicts the predicted inundated areas under varying circumstances. All of these predictions would result in the substantial contamination of the environment by coal ash, not to mention destruction or damage to surrounding communities.

[43] Alabama Power Company (2017). *CCR Surface Impoundment Emergency Action Plan Plant Miller.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-miller/ash-pond/design-criteria/Emergency%20Action%20Plan%20-%20Ash%20Pond.pdf*

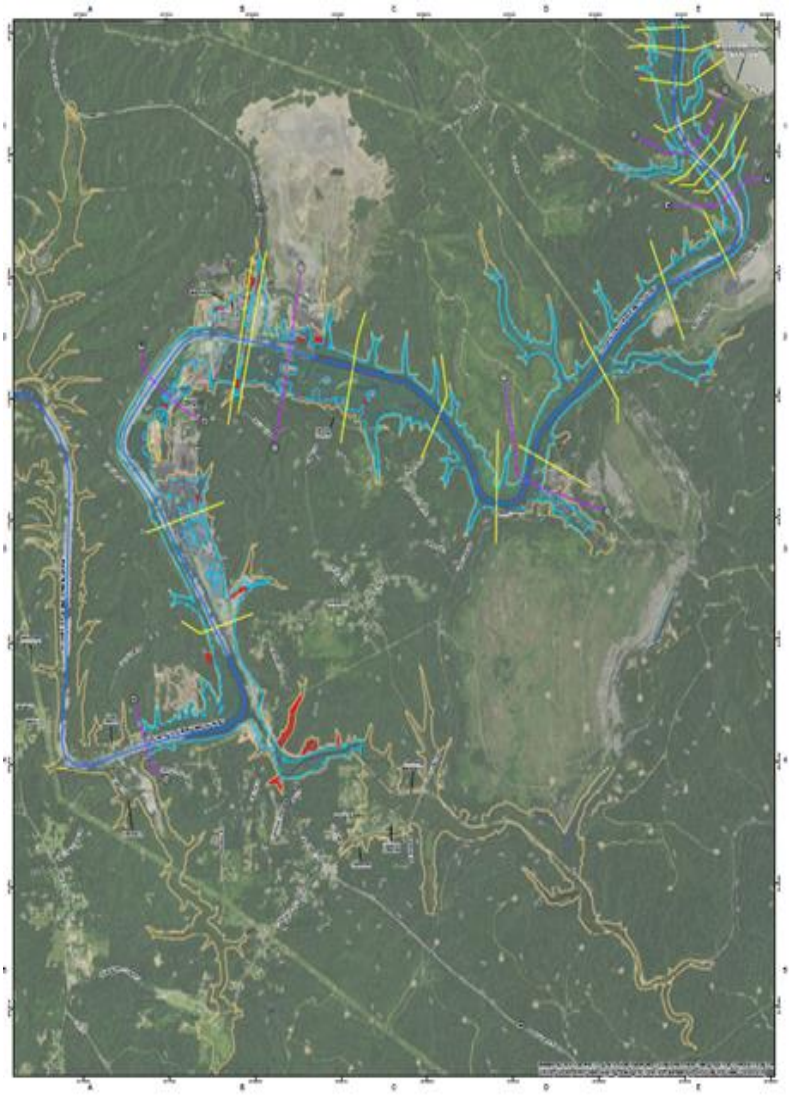

Figure 20. Map Depicting Area Potentially Inundated in the Event of Dam Failure at Plant Miller | Source: Alabama Power Company (2017). *CCR Surface Impoundment Emergency Action Plan Plant Miller*

4.3 Plant Gorgas Overview

Alabama Power's Plant Gorgas is located in Walker County, AL near the town of Parrish, where Baker Creek flows into the Mulberry Fork of the Black Warrior River. After more than 100 years of generating electricity by burning coal, Plant Gorgas was decommissioned on April 15, 2019.[44] During its century of operation, Alabama Power disposed of coal combustion residuals in several different areas around the facility. The largest of these ash dumps, the

[44] Van der Bijl, Hanno (2019). Birmingham Business Journal. *Another coal-fired power plant to close in Alabama.* *https://www.bizjournals.com/birmingham/news/2019/02/20/another-coal-fired-power-plant-to-close-in-alabama.html*

primary coal ash pond known locally as Rattlesnake Lake, has received the bulk of the electric plant's CCR waste over the last 60+ years. The facility's gypsum pond, which has only been in operation for about 14 years, also receives some CCR residue mixed with spent gypsum from the plant's air pollution emissions scrubbers.[45] In more recent years, Alabama Power has used three onsite landfill structures for additional CCR disposal, one each for bottom ash, fly ash, and gypsum. In March of 2018, ADEM filed an Administrative Order for groundwater pollution caused by the CCR units at Plant Gorgas, just as it did for every other plant operated by Alabama Power in the state. The AO imposed a fine of $250,000 for the groundwater pollution at Plant Gorgas and required APCO to submit plans related to corrective actions it will take to mitigate the groundwater contamination (discussed below as an "Assessment of Corrective Measures" or ACM).

Figure 21. Aerial view of Plant Gorgas on the Mulberry Fork. Gypsum pond far left, gypsum & CCR landfills to right of plant, Rattlesnake Lake dam bottom right | Flight by SouthWings.org

[45] Alabama Power Company (2018). *History of Construction for Existing CCR Surface Impoundment Plant Gorgas Gypsum Pond. https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/gypsum-pond/design-criteria/History%20of%20Construction%20-%20Gypsum%20Pond.pdf*

4.3.1 *Plant Gorgas Ash Pond (a.k.a. Rattlesnake Lake)*

The primary coal ash disposal facility in the past 60+ years for the waste created at Plant Gorgas is a 420 acre impoundment on the opposite bank of the Mulberry Fork from the electric generating facility.[46] It was constructed in 1953 as a cross-valley dam blocking Rattlesnake Creek. Currently, the dam stands at about 140 feet above the elevation of the river below.[47] As of a May 1, 2018 inspection, Rattlesnake Lake contained approximately 25 million cubic yards of coal ash, according to documents published on the power company's website.[48] In 2018, wastewater from the ash pond was discharged to the Mulberry Fork at a rate of up to 28.5 million gallons per day, based on discharge monitoring reports filed (DMRs) by APCO.[49]

Figure 22. Aerial view of Plant Gorgas on the Mulberry Fork with Rattlesnake Lake top left | Flight by SouthWings.org

[46] Alabama Power Company (2016). *Closure Plan for Existing CCR Surface Impoundment Plant Gorgas Ash Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/ash-pond/closure-and-post-closure/Gorgas%20Ash%20Pond%20Amended%20Closure%20Plan%20REV1%20April%202020.pdf*

[47] Alabama Power Company (2018). *Updated History of Construction for Existing CCR Surface Impoundment Plant Gorgas Ash Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/ash-pond/design-criteria/Updated%20History%20of%20Construction%20-%20Ash%20Pond.pdf*

[48] Alabama Power Company (2018). *Report of Annual Inspection of CCR Surface Impoundment.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/ash-pond/operating-criteria/Report%20of%20Annual%20Inspection%202018%20-%20Ash%20Pond.pdf*

[49] AL0002909 - *http://app.adem.alabama.gov/eFile/*

Figure 23. Aerial view of Plant Gorgas' Rattlesnake Lake coal ash impoundment | Flight by SouthWings.org

As is common at APCO's CCR disposal sites throughout the state, Rattlesnake Lake was constructed without the minimum 5 foot buffer between the base of the CCR unit and the uppermost limit of the uppermost, underlying aquifer.[50] The impoundment was also constructed without any bottom liner to prevent contamination of the underlying aquifer.[51] Because Rattlesnake Lake does not meet current specifications, it is out of compliance with state and federal regulations, meaning that it must be permanently closed, just like the ash ponds at plants Miller and Greene County.

[50] Alabama Power Company (2018). *Location Restriction Demonstration Plant Gorgas Ash Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/ash-pond/location-restriction-demonstration/Location%20Restriction%20Demonstration%20-%20Plant%20Gorgas%20Ash%20Pond.pdf*

[51] Alabama Power Company (2018). *Liner Design Criteria Plant Gorgas Ash Storage Surface Impoundment.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/ash-pond/design-criteria/Liner%20Design%20Criteria%20-%20Ash%20Pond.pdf*

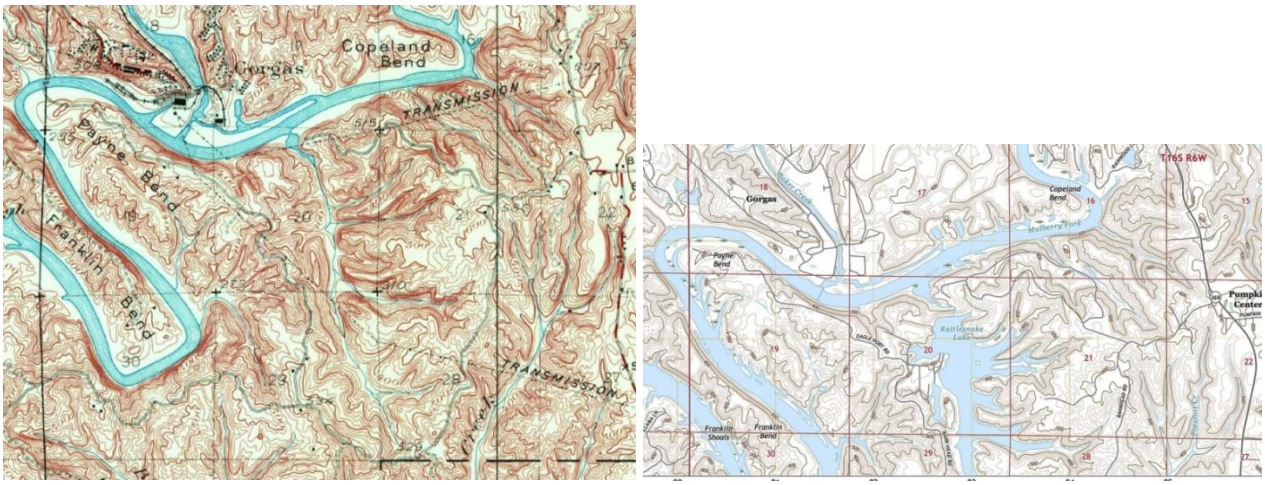

Figure 24. USGS Topographic Maps | 1938 | | Rattlesnake Creek | Mulberry Fork | | 2018 |

Rattlesnake Creek was dammed by Alabama Power in the early 1950s to form Rattlesnake Lake for coal ash waste storage. The majority of the creek and its tributaries are impounded as a result. Only the tail end of the creek remains below the dam before it flows into the Mulberry Fork. This part of the creek is a slough due to being part of the Mulberry Fork's reservoir effect caused by Bankhead Dam far downstream on the Black Warrior River.


Figure 25. Rattlesnake Dam looms over a fisherman in the slough below

The slough has received tens of millions of gallons of Alabama Power's coal ash polluted wastewater each day through a wastewater discharge permitted via their ADEM-issued National Pollutant Discharge Elimination System permit AL0002909, which does not include necessary upgrades that comport with current science on river and health protections. Alabama Power's NPDES permit was issued by ADEM on September 6, 2007 and expired on September 5, 2012. ADEM has administratively extended the permit ever since then. In the intervening years, the EPA required Alabama Power to install an air pollution emissions scrubber at Gorgas in 2009, and the pollutants scrubbed from air emissions have been added to the power plant's CCR waste-stream, which diverts to onsite landfills, the gypsum pond, and the coal ash pond. Despite the addition of these waste streams, ADEM elected to maintain the old, outdated permit, rather than upgrade it.

Figure 26. Wastewater from the ash pond's NPDES discharge pipe enters a slough off the Mulberry Fork

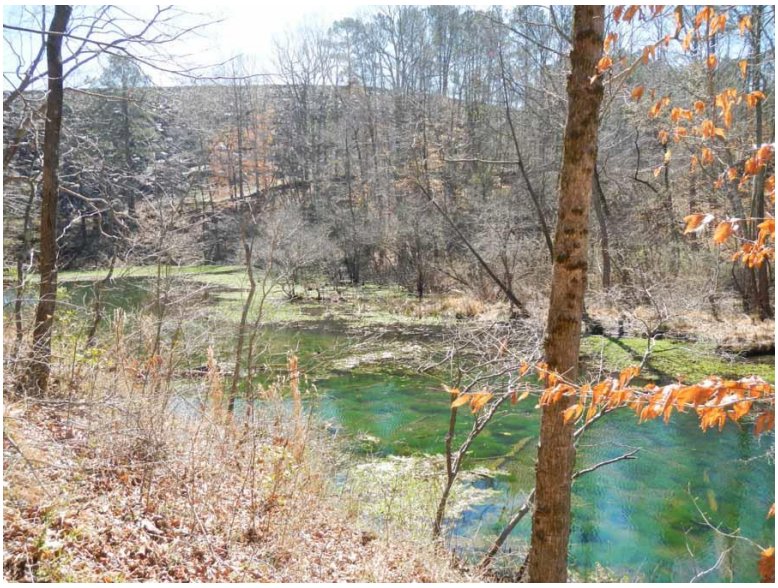

Figure 27. Not even Rattlesnake Dam can keep coal ash contaminated water from Rattlesnake Lake from seeping through to follow its native path toward the Mulberry Fork

Capping coal ash in place at Plant Gorgas' Rattlesnake Lake will not erase the very real connection that exists between Alabama Power's toxic coal ash, the creek buried underneath it, and the groundwater it is sitting in. All of this water is flowing and moving constantly, creating an ongoing pathway for continued contamination of groundwater throughout the area, local streams, Rattlesnake Creek, and the Mulberry Fork. A flowing creek, fed by groundwater and springs, cannot be dewatered. No matter what Alabama Power endeavors to do at Rattlesnake Lake, leaving toxic coal ash in place there will cause continued intermingling of ash waste with the creek and groundwater for future generations to deal with.

Once again, Alabama Power has elected cap-in-place as its preferred method for closing the ash pond at Plant Gorgas. The power company intended to begin dewatering the facility at some point in 2019, and anticipates completing closure work by 2028.[52] However, APCO's announced plans do not seem to take into account the inherent difficulty in removing the water from a continuously flowing creek that drains a watershed of over 1,300 acres. Furthermore, the plans do not address exactly how the left-over coal ash will be separated from the natural course of Rattlesnake Creek. The plans simply state the coal ash will be consolidated to an area somewhat smaller than its current footprint and covered with a low-permeability liner. Alabama Power has not indicated that any form of protective bottom liner will be employed to prevent future contamination of groundwater.

Unfortunately, groundwater pollution is already a major concern in the area of Rattlesnake Lake. Alabama Power's monitoring has detected contamination of arsenic, lithium and molybdenum in the underlying aquifer.[53] The tables below provide more specific information related to the extent of groundwater contamination from samples reported by Alabama Power over the last two years.

Plant Gorgas Groundwater Protection Standards (GWPS) Exceedances

Annual 2019	Well Number	Analyte	GWPS	Result	Percent Of GWPS
1st Semi-Annual (April)	MW-2	Lithium	0.04	0.0421	105%
	MW-6D	Arsenic	0.01	0.088	880%
	MW-6D	Lithium	0.04	0.267	668%
	MW-6S	Arsenic	0.01	0.0164	164%
	MW-7	Arsenic	0.01	0.207	2070%
	MW-7	Lithium	0.04	0.144	360%
	MW-7	Molybdenum	0.1	0.185	185%
	MW-9	Lithium	0.04	0.0673	168%
	MW-12	Arsenic	0.01	0.014	140%
	MW-15	Lithium	0.04	0.19	475%
	MW-17	Lithium	0.04	0.0574	144%
	MW-18	Lithium	0.04	0.0942	236%
	MW-19	Lithium	0.04	0.0492	123%
	MW-21	Lithium	0.04	0.312	780%
2nd Semi-Annual (September)	MW-2	Lithium	0.04	0.0457	114%
	MW-6D	Arsenic	0.01	0.0876	876%
	MW-6D	Lithium	0.04	0.264	660%
	MW-6S	Arsenic	0.01	0.0105	105%
	MW-7	Arsenic	0.01	0.233	2330%
	MW-7	Lithium	0.04	0.156	390%
	MW-7	Molybdenum	0.1	0.178	178%
	MW-12	Arsenic	0.01	0.0135	135%
	MW-12V	Lithium	0.04	0.0611	153%
	MW-15	Arsenic	0.01	0.011	110%
	MW-15	Lithium	0.04	0.469	1173%
	MW-17	Lithium	0.04	0.0583	146%
	MW-17V	Lithium	0.04	0.0809	202%
	MW-18	Lithium	0.04	0.114	285%
	MW-21	Lithium	0.04	0.276	690%
	MW-23H	Arsenic	0.01	0.0369	369%
	MW-26H	Lithium	0.04	0.0945	236%
	MW-28H	Lithium	0.04	0.0619	155%
	MW-29H	Lithium	0.04	0.0509	127%

[52] Alabama Power Company (2016). *Closure Plan for Existing CCR Surface Impoundment Plant Gorgas Ash Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/ash-pond/closure-and-post-closure/Gorgas%20Ash%20Pond%20Amended%20Closure%20Plan%20REV1%20April%202020.pdf*

[53] Alabama Power Company (2019). *Notice of Groundwater Protection Standard Exceedance Plant Gorgas Ash Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/ash-pond/groundwater-monitoring-and-corrective-action/Notice%20of%20Groundwater%20Protection%20Standard%20Exceedance%20-%20Gorgas%20Ash%20Pond.pdf*

Plant Gorgas Groundwater Protection Standards Exceedances					
Annual 2020	**Well Number**	**Analyte**	**GWPS**	**Result**	**Percent Of GWPS**
1st Semi-Annual (March/May)	MW-2 (March)	Lithium	0.04	0.0434	109%
	MW-2 (May)	Lithium	0.04	0.0409	102%
	MW-6	Lithium	0.04	0.0695	174%
	MW-6D	Arsenic	0.01	0.105	1050%
	MW-6D	Lithium	0.04	0.292	730%
	MW-6V	Fluoride	4	4.46	112%
	MW-6V	Lithium	0.04	0.138	345%
	MW-7	Arsenic	0.01	0.285	2850%
	MW-7	Lithium	0.01	0.161	1610%
	MW-7	Molybdenum	0.1	0.193	193%
	MW-15	Arsenic	0.01	0.0217	217%
	MW-15	Lithium	0.04	0.378	945%
	MW-15V	Arsenic	0.01	0.011	110%
	MW-17 (March)	Lithium	0.04	0.0665	166%
	MW-17 (May)	Lithium	0.04	0.0602	151%
	MW-18	Lithium	0.04	0.116	290%
	MW-19	Lithium	0.04	0.0417	104%
	MW-21	Lithium	0.04	0.379	948%
	MW-21	Molybdenum	0.1	0.102	102%
	MW-21V	Arsenic	0.01	0.0159	159%
	MW-21V	Lithium	0.04	0.146	365%
	MW-21V	Molybdenum	0.1	0.117	117%
	MW-23H	Arsenic	0.01	0.0524	524%
	MW-25HA	Lithium	0.04	0.0461	115%
	MW-26H	Lithium	0.04	0.0946	237%
	MW-28H (March)	Lithium	0.04	0.0627	157%
	MW-28H (May)	Lithium	0.04	0.0569	142%
	MW-29H	Lithium	0.04	0.0528	132%
	MW-30HA (March)	Lithium	0.04	0.0528	132%
	MW-30HA (May)	Lithium	0.04	0.0536	134%
	MW-32H	Lithium	0.04	0.0428	107%
	MW-33HO (March)	Lithium	0.04	0.0516	129%
	MW-33HO (May)	Lithium	0.04	0.0455	114%
	MW-34HO (March)	Lithium	0.04	0.205	513%
	MW-34HO (May)	Lithium	0.04	0.18	450%
	MW-35HO (March)	Lithium	0.04	0.074	185%
	MW-35HO (May)	Lithium	0.04	0.0693	173%
	MW-35HO (March)	Radium	5	7.32	146%
	MW-38H	Lithium	0.04	0.0632	158%
	MW-41HD	Lithium	0.04	0.311	778%
	MW-43HO	Lithium	0.04	0.0505	126%
	MW-44HO	Lithium	0.04	0.0411	103%
	PZ-16	Lithium	0.04	0.0734	184%
	PZ-18	Arsenic	0.01	0.0275	275%
	PZ-18	Lithium	0.04	0.109	273%
	PZ-22	Lithium	0.04	0.0734	184%
2nd Semi-Annual (September)	MW-6D	Arsenic	0.01	0.0931	931%
	MW-6D	Lithium	0.04	0.299	748%
	MW-6V	Fluoride	4	4.59	115%
	MW-6V	Lithium	0.04	0.136	340%
	MW-7	Arsenic	0.01	0.282	2820%
	MW-7	Lithium	0.04	0.16	400%
	MW-7	Molybdenum	0.1	0.215	215%
	MW-12V	Lithium	0.04	0.0409	102%
	MW-15	Arsenic	0.01	0.0165	165%
	MW-15	Lithium	0.04	0.414	1035%
	MW-15V	Arsenic	0.01	0.0167	167%
	MW-15V	Lithium	0.04	0.116	290%
	MW-16S	Lithium	0.04	0.074	185%
	MW-17	Lithium	0.04	0.0579	145%
	MW-17V	Lithium	0.04	0.0574	144%
	MW-18	Lithium	0.04	0.0895	224%
	MW-19	Lithium	0.04	0.0435	109%
	MW-21	Lithium	0.04	0.179	448%
	MW-21V	Lithium	0.04	0.137	343%
	MW-21V	Molybdenum	0.1	0.12	120%
	MW-23H	Arsenic	0.01	0.0579	579%
	MW-25HA	Lithium	0.04	0.0449	112%
	MW-26H	Lithium	0.04	0.0958	240%
	MW-29H	Lithium	0.04	0.0574	144%
	MW-29H	Lithium	0.04	0.0586	147%
	MW-30HA	Lithium	0.04	0.494	1235%
	MW-32H	Lithium	0.04	0.0421	105%
	MW-33HO	Lithium	0.04	0.0479	120%
	MW-34HO	Lithium	0.04	0.18	450%
	MW-35HO	Lithium	0.04	0.0685	171%
	MW-38H	Lithium	0.04	0.0591	148%
	MW-40H	Lithium	0.04	0.0405	101%
	MW-41HD	Lithium	0.04	0.341	853%
	MW-43H	Lithium	0.04	0.0587	147%
	MW-44HO	Lithium	0.04	0.0494	124%
	PZ-16	Lithium	0.04	0.073	183%
	PZ-18	Arsenic	0.01	0.0119	119%
	PZ-18	Lithium	0.04	0.0789	197%
	PZ-22	Lithium	0.04	0.0862	216%

Figure 28. Gorgas Coal Ash Groundwater Violations

In accordance with ADEM's Administrative Order and federal regulations, Alabama Power was required to submit an Assessment of Corrective Measures for the ash pond and gypsum pond at Plant Gorgas. Submitted in July, 2019, the ACM for Plant Gorgas, much like the one for plants Miller and Greene County, proposes only monitored natural attenuation (MNA) in addition to the already mandated closure of the ponds to address the contamination of groundwater.[54] Once again, Alabama Power estimates that the selected remedial processes will take at least 30 years to remediate groundwater pollution. However, MNA through cap-in-place does not work for coal ash that sits in water and continually discharges into state waters, as is the case at Plant Gorgas. This is especially true for dangerous inorganics like arsenic and lithium. *See* November 14, 2019 Letter from ADEM's Heather M. Jones to APCO's Dustin Brooks at 7. Moreover, MNA requires that an aquifer have sufficient capacity for that attenuation to take place. *Id.* Alabama Power has yet to demonstrate how monitored natural attenuation will work on the inorganics present, evaluate whether it is a feasible remedy based upon site specific conditions at Plant Gorgas or even analyzed whether the aquifer has sufficient capacity for attenuation to take place. *Id.*

Leaving the dam and coal ash in place at Rattlesnake Lake carries an even greater long-term threat than the impoundments at APCO's other facilities in the Black Warrior River watershed. Its assessment resulted in the designation of a High Hazard Potential classification, meaning that in addition to severe economic and environmental consequences, failure of the dam at Plant Gorgas would also result in the likely loss of human life as well.[55] The proposed closure activities will do little to alleviate this threat for the foreseeable future. Alabama is the only state without a dam safety program, a program that requires not only annual maintenance and inspection, but crucial record keeping on dams' conditions and how heavily a breach would affect residents downstream.[56] Many miles of riverfront communities, including homes, motor home parks, boat launches, and fishing camps would likely be smothered with coal ash and contaminated water in such an event. The map below demonstrates the area that could be flooded in the event of such a preventable disaster.

[54] Alabama Power Company (2019). *Assessment of Corrective Measures Plant Gorgas.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/ash-pond/groundwater-monitoring-and-corrective-action/Assessment%20of%20Corrective%20Measures%20Plant%20Gorgas%20Ash%20Pond.pdf*

[55] Alabama Power Company (2017). *CCR Surface Impoundment Emergency Action Plan Plant Gorgas Ash Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/ash-pond/design-criteria/Emergency%20Action%20Plan%20-%20Ash%20Pond.pdf*

[56] https://www.governing.com/topics/transportation-infrastructure/The-Only-State-With-No-Dam-Safety-Program.html.

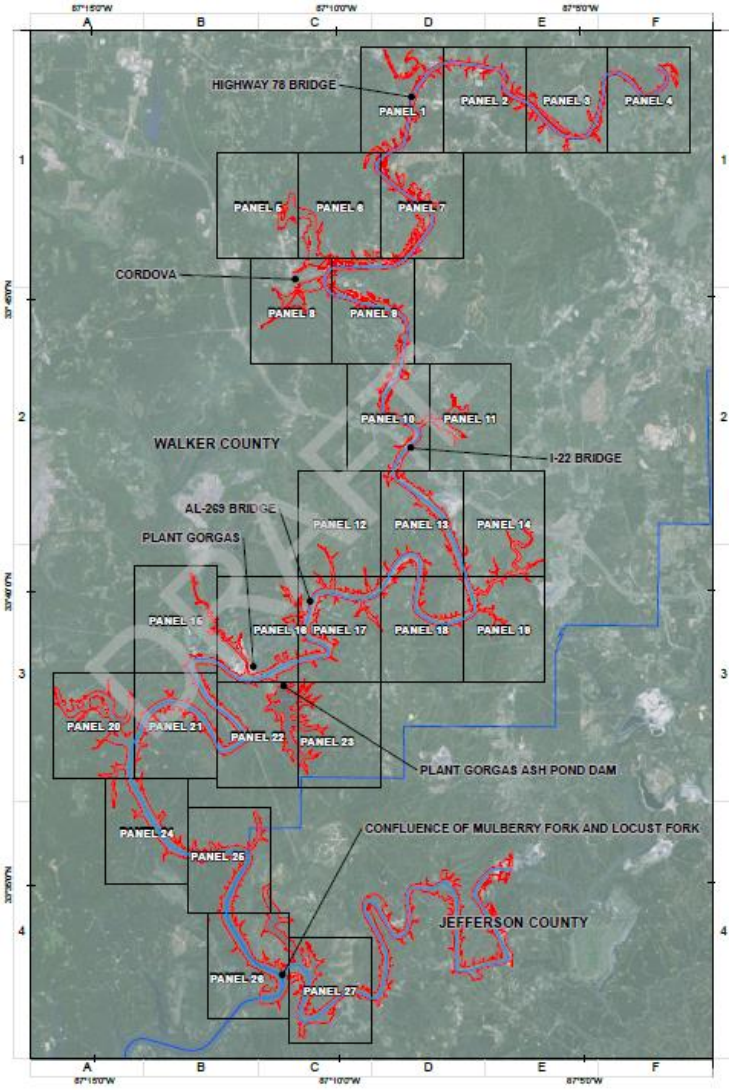

Figure 29. Map Depicting Area Potentially Inundated in the Event of Dam Failure at Plant Gorgas | Source: Alabama Power Company (2017). *CCR Surface Impoundment Emergency Action Plan Plant Gorgas Ash Pond*

4.3.2 *Plant Gorgas Gypsum Pond*

The Gypsum pond is approximately 18 acres in size and was constructed in 2007. This pond receives decant water from the CCR and wet gypsum from the scrubber operation (flue-gas desulfurization) that is disposed of in the Gypsum landfill at Plant Gorgas.[57] For clarification, gypsum is a mineral consisting of hydrous calcium sulfate that is used in making drywall and some fertilizer products. Exposure to gypsum dust for long periods of time can lead to ocular and

[57] Alabama Power Company (2018). *History of Construction for Existing CCR Surface Impoundment Plant Gorgas Gypsum Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/gypsum-pond/design-criteria/History%20of%20Construction%20-%20Gypsum%20Pond.pdf*

respiratory problems (if not treated immediately).[58] Approximately 916,000 cubic yards of CCR are stored in the gypsum pond.[59]

Much like the ash pond at Plant Gorgas, the gypsum pond was rated as a "Significant Hazard Potential." [60] The Gypsum pond at Plant Gorgas was not constructed with a bottom liner that meets current criteria.[61] Although the Gypsum pond was constructed more than 5 feet above the groundwater table using modern methods, APCO's own monitoring has detected lithium contamination in groundwater in the vicinity of the Gypsum pond.[62] If left in place, the Gypsum pond will be an ongoing threat to groundwater and the local environment and economy.

Annual 2018	Well Number	Analyte	GWPS	Result	Percent Above GWPS
1st Semi-annual	MW-3	Lithium	0.04	0.425	1063%
2nd Semi-Annual	MW-3	Lithium	0.04	0.494	1235%
	MW-4	Lithium	0.04	0.266	665%

Figure 30. Gorgas Gypsum Pond Groundwater Violations

Fortunately, APCO has announced its intent to close the gypsum pond by removal of CCR.[63] "CCR and CCR laden soils will be disposed of in a permitted landfill or transported offsite for beneficial reuse. Free liquids within the surface impoundment will be routed to an onsite water treatment system and then discharged through the facility's NPDES permitted outfall." The plans for closure by removal are a reversal of previous plans to leave the CCR in

[58] TOXNET, US National Library of Medicine (2009). *Calcium Sulfate.* *https://toxnet.nlm.nih.gov/cgi-bin/sis/search/a?dbs+hsdb:@term+@DOCNO+902*

[59] Alabama Power Company (2018). *Report of Annual Inspection of CCR Surface Impoundment.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/gypsum-pond/operating-criteria/Report%20of%20Annual%20Inspection%202018%20-%20Gypsum%20Pond.pdf*

[60] Alabama Power Company (2017). *CCR Surface Impoundment Emergency Action Plan Plant Gorgas Gypsum Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/gypsum-pond/design-criteria/Emergency%20Action%20Plan%20-%20Gypsum%20Pond.pdf*

[61] Alabama Power Company (2016). *Liner Design Criteria Plant Gorgas Gypsum Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/gypsum-pond/design-criteria/Liner%20Design%20Criteria%20-%20Gypsum%20Pond.pdf*

[62] Alabama Power Company (2019). *Notice of Groundwater Protection Standard Exceedance.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/gypsum-pond/groundwater-monitoring-and-corrective-action/Notice%20of%20Groundwater%20Protection%20Standard%20Exceedance%20-%20Gorgas%20Gypsum%20Pond.pdf*

[63] Alabama Power Company (2019). *Amended Written Closure Plan for Existing CCR Surface Impoundment Plant Gorgas Gypsum Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/gypsum-pond/closure-and-post-closure/Gorgas%20Gypsum%20Pond%20Amended%20Closure%20Plan%20REV1%20April%202020.pdf*

place at the gypsum pond.[64] Closure of the gypsum pond was initiated on April 15, 2019 and is expected to take up to 7 years to complete, even without placing a bottom liner beneath this pond.

5. Conclusion and Direction

The evidence presented in this report demonstrates the critical need to use the excavation approach rather than cap-in-place for all three coal plants along the Black Warrior River. Not only does cap-in-place threaten groundwater, nearby streams and rivers, and wildlife, it also threatens the drinking water, lives, and livelihoods of nearby communities. Cap-in-place does not include a bottom liner, which will allow ongoing contamination of the groundwater beneath and around the coal ash ponds. Furthermore, as research conducted by APCO highlights, unlined pits have led to dangerous levels of toxic pollutants such as arsenic, cobalt, lithium, and other cancer-causing pollutants. In fact, these unlined coal ash pits will continue to leak pollution into the groundwater regardless of cap-in-place, which is counterproductive if the goal is to protect Alabamians from contamination. Meanwhile, excavation of coal ash in places like South Carolina has resulted in quickly reducing arsenic levels by up to 95%.[65]

APCO's plan to cap-in-place will not solve harmful groundwater pollution or the potential for dangerous leaks or dam breaches. APCO has stated that they plan to pursue cap-in-place because it is the most cost-effective closure technique. Through an economic lens, however, it would be more logical to implement excavation because it will not only stop the ongoing contamination of groundwater: it will prevent future economic loss from dam failures or natural disasters. APCO's ash ponds are classified as having Significant or High Hazard Potential. When failures or contaminations occur (not if, when), this will cost the utility billions in cleanup costs. Worse yet, it will significantly affect Alabama's $14 billion outdoor recreational industry, and communities and businesses that rely on the areas surrounding these ponds for years to come.[66]

Though the immediate expense of excavation may seem costly, it is ultimately foolish to hope that no natural disasters or failures will occur at these enormous and dangerous coal ash waste disposal sites. Furthermore, it is vital for our leaders to consider the human and environmental costs of failing to properly address coal ash pollution now. The excavation of

[64] Alabama Power Company (2016). *Closure Plan for Existing CCR Surface Impoundment Plant Gorgas Gypsum Pond.* *https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-gorgas/gypsum-pond/closure-and-post-closure/Closure%20Plan%20-%20Gypsum%20Pond.pdf*

[65] Southern Environmental Law Center (2016). *South Carolina Groundwater Contamination Plummets after Coal Ash Removal.* *https://www.southernenvironment.org/news-and-press/press-releases/south-carolina-groundwater-contamination-plummets-after-coal-ash-removal*

[66] Outdoor Industry Association (2019) *State-Alabama.* *https://outdoorindustry.org/state/alabama/*

toxic coal ash from its current resting place in unlined, leaking ponds, recycling as much of the recovered ash as possible into encapsulated concrete, and the disposal of any ash that cannot be recycled in lined, upland landfills away from rivers and vulnerable communities is the best option. For the safety of Alabamians and wildlife, and for the future our children deserve, we push for a healthy river system. We can only improve the Black Warrior River watershed for wildlife habitat, water quality, and people's myriad uses if we are proactive with coal ash disposal. Alabama Power owes it to current and future generations to do the right thing with coal ash handling, management, and disposal. Alabama Power must abandon its shortsighted plans for cap-in-place.

Figure 29. Black Warrior Riverkeeper patrol boat on the Locust Fork downstream of Plant Miller