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VIA E-MAIL (HARD COPY TO FOLLOW BY U.S. MAIL)

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Re: **Incomplete, Inaccurate Coal Ash Assessment**

Dear Senators Surovell and Chase,

The Southern Environmental Law Center has evaluated Dominion's coal ash assessment¹ and concludes that it is incomplete and inaccurate, lacks much of the required information and analysis, and exhibits a clear bias towards cap-in-place rather than providing fair and objective evaluation of closure methods.

As you know, the Coal Ash "Assessment Law" (Senate Bill 1398, 2017 Va. Acts ch. 817), a bill you both co-sponsored, put the closure permitting process on hold while the owners of coal ash sites in the Chesapeake Bay watershed gathered and analyzed critical information about its impoundments. The Assessment Law directed the evaluation of existing pollution at the sites and possible corrective measures, and the long-term safety from weather and other events. In addition, owners were to assess the feasibility of "clean closure" options—namely excavation and removal of the coal ash either to a modern, permitted landfill or for use in concrete or cement. This information is critical to enable Virginia to make an informed decision

¹ Dominion, Senate Bill 1398 Response, Coal Combustion Residuals Ash Pond Closure Assessment, prepared by AECOM (Nov. 2017) ("Assessment").

about closing these sites—which include the impoundments at Brema Power Station, Possum Point Power Station, Chesterfield Power Station, and Chesapeake Energy Center, all of which fall within the Chesapeake Bay watershed. Governor McAuliffe, in proposing amendments to the bill to reinstate the permitting moratorium in your original bill, emphasized the law’s importance:

[T]here has been tremendous public concern and outreach on this topic. As such, I am proposing amendments to Senate Bill 1398 that will provide the public with more information on the costs and benefits, risks, and recycling options for coal ash before a final decision on the permits is reached. My hope is that this additional process will increase the public’s confidence in the path that Virginia ultimately takes.²

As you know, the bill passed with overwhelming bipartisan support: 37 to 3 in the Senate, and 92 to 3 in the House with two abstentions.

The General Assembly spoke. Dominion did not listen. Dominion’s assessment is fundamentally flawed, missing critical information, and skewed towards justifying cap-in-place.

First, with respect to the Chesapeake site, Dominion has left out of the assessment entirely over 2.1 million tons of coal ash—representing two-thirds of the ash at the whole site. Dominion disposed of this ash in several unlined settling lagoons, collectively known as the “Historic Pond.” This ash clearly is subject to the Assessment Law, yet Dominion chose only to assess a small percentage of the coal ash at the site stored in another surface impoundment known as the Bottom Ash Pond. The glaring omission of the unlined Historic Pond is particularly problematic since a federal district court has ruled that arsenic in the coal ash is leaking from all the impoundments at Chesapeake into the groundwater and directly into the surrounding surface waters.

Second, even for the coal ash Dominion has decided to assess, it fails to provide the data and analysis required by the Assessment Law. Although Dominion admits that the groundwater is contaminated at all of the sites, Dominion does not address the fundamental issues of whether the coal ash at these sites is in contact with groundwater, whether the contaminated groundwater is discharging to surface waters, and whether installing a cap over the ash would in fact be effective in stopping such pollution. To fill in the gaps left by Dominion for Brema, Possum Point, and Chesterfield, SELC engaged a team of hydrologists led by Anthony Brown of Aquilogic, Inc.³ Based on the available sampling data and other information, Aquilogic’s

² Press Release, Gov. McAuliffe, Proposed Amendments to Coal Ash Bill (Mar. 22, 2017); *see also* Zullo, R., Richmond Times-Dispatch, Virginia House of Delegates committee defangs coal ash bill, (Feb. 15, 2017) (explaining purposes of bill); McConnell, J., Chesterfield Observer, GOP ushers through coal ash legislation (Apr. 12, 2017) (same).

³ *See* Attachment B, Aquilogic, Technical Memorandum, Review of Groundwater Conditions, North Ash Pond at Dominion’s Brema Power Station (Jan. 15, 2018); Attachment C, Aquilogic, Technical Memorandum, Review of Groundwater Conditions, Ash Pond D at the Possum Point

evaluation shows that significant groundwater pollution exists at all of these sites and that this pollution is being released into the surrounding rivers. Moreover, given the location of these impoundments and groundwater conditions, “capping” these sites cannot and will not stop this pollution.

Third, Dominion makes a number of unrealistic assumptions in analyzing clean closure options, which serve to artificially inflate the time and costs associated with these options. For example, Dominion takes an “all or nothing” approach to each option. If an onsite landfill could only be constructed to hold half of a site’s ash, Dominion rejected that option out of hand. In the real world, however, a company would consider whether it could construct such a landfill, and then, for example, recycling the remainder. Such an approach would likely save significant time and money to complete clean closure—but Dominion made no attempt to analyze these sorts of sensible solutions. Dominion’s failure to do so suggests the assessment was not aimed at an objective evaluation of clean closure options, but instead was skewed towards justifying a cap-in-place approach.

Fourth, Dominion’s assessment artificially and unrealistically limits the market for recycled coal ash. SELC and the Potomac Riverkeeper Network engaged Dr. Kevin H. Gardner, a professor at the University of New Hampshire and Scott Greenwood, a research engineer, to evaluate Dominion’s market study for the beneficial use of ash. Gardner and Greenwood conclude that Dominion’s study is not credible, based on a number of errors and unjustified assumptions.⁴ For example, Dominion assumes it cannot sell its ash at greater distances than 50 miles, yet elsewhere acknowledges that coal ash is being imported into Virginia from North Carolina, South Carolina, Georgia, Tennessee, Ohio, and even India. Clearly the market is much greater than 50 miles. Dominion also makes a significant error by conflating transportation costs of recycled ash with the price that Dominion would be paid for the ash. By doing so, Dominion has significantly inflated the cost estimate for closure by removal for beneficial reuse. Dominion’s reliance on unsubstantiated and contradictory assumptions that serve to limit the market for recycled ash, again suggests that its assessment was skewed towards justifying a cap-in-place approach.

Finally, Dominion understates the true cost of leaving this ash in leaking, unlined pits. In fact, clean closing these leaking pits now is likely to be cheaper in the long run. Dominion’s cap-in-place costs are simply construction estimates. These estimates do not account for public health costs, environmental remediation costs, costs following a failure, and the very real possibility that these sites will be required to clean close if a cap proves ineffective at remedying the existing pollution.

As you know, state officials and the public were counting on receiving a fair, objective, and complete assessment. Virginia needs this information so that it can begin making sensible, long-term closure decisions. Instead, Dominion provided an assessment replete with deficiencies

Power Station (Jan. 15, 2018); Attachment D, Aquilogic, Technical Memorandum, Review of Groundwater Conditions, Coal Ash Waste Ponds at Chesterfield Power Station (Jan. 15, 2018).

⁴ Attachment E, Kevin H. Gardner & Scott Greenwood, University of New Hampshire, Response to Dominion Energy Report entitled: Senate Bill 1398 Response, Coal Combustion Residuals, Ash Pond Closure Assessment (Jan. 2018).

and a clearly skewed analysis of clean closure solutions—contrary to the requirements of the Assessment Law. While other states in our region are making progress with sensible, economic clean closure solutions,⁵ Virginia continues to fall behind. Based on this skewed assessment, Dominion’s coal ash will continue to sit unused in unlined, leaking pits, while Virginia manufacturers who could use this ash will continue to import ash from out of state, even as far as India.

I. DOMINION FAILED TO ASSESS 2.1 MILLION TONS OF ASH AT THE CHESAPEAKE ENERGY CENTER—ASH THAT IS DISCHARGING ARSENIC INTO OUR RIVERS.

The Assessment Law required Dominion to perform an assessment of every “coal combustion residuals surface impoundment.”⁶ Dominion did not do so.

At its Chesapeake Energy Center, Dominion stores approximately 3.4 million tons of coal ash at the site, between 72,000 and 84,000 tons in the Bottom Ash Pond, 2.1 million tons in the “Historic Pond,” and 1.2 million tons in the “Ash Landfill”. In its assessment, however, Dominion only assessed the ash in the Bottom Ash Pond—representing just *two percent* of the ash the site.⁷ Dominion failed to perform an assessment of the 2.1 million tons of coal ash in the Historic Pond, even though it—like the Bottom Ash Pond—clearly is a “coal combustion residuals surface impoundment.”

A CCR surface impoundment is defined as a “natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR.”⁸ This definition clearly encompasses the Historic Pond. The U.S. District Court for the Eastern District of Virginia (“District Court”) has described the Historic Pond as follows:

The [Chesapeake Energy Center] burnt coal to make electricity, and created an enormous amount of coal ash. Dominion moved the ash from the plant to several on-site storage facilities. Between 1953 and 1984, Dominion kept the ash in three different settling ponds, collectively known as the Historic Pond. The Historic Pond does not have a liner beneath it. Dominion created the Historic Pond and engineered it with the express intention of using it for coal ash.⁹

Thus, the Historic Pond is clearly a CCR surface impoundment. The three unlined settling ponds are “man-made excavations” or “diked areas” that Dominion designed to hold an accumulation

⁵ Attachment A, Dominion Putting Virginia at Risk.

⁶ 2017 Va. Acts ch. 817.

⁷ Dominion provides only limited information about the Bottom Ash Pond since it has proposed excavating that ash.

⁸ 40 C.F.R. § 257.53. These federal regulations have been expressly incorporated in the Virginia Solid Waste Management Regulations at 9 VAC 20-81-800.

⁹ *Sierra Club v. Va. Elec. & Power Co.*, 247 F. Supp. 3d 753, 756 (E.D. Va. 2017).

of coal ash and liquids, as the coal ash was sluiced into the settling ponds. Dominion then “treat[ed]” the coal ash in the Historic Pond through a settling process, and then “dispose[d] of and store[d] nearly 30 years’ worth of coal ash solid and liquids in these settling ponds.

Clearly, the Historic Pond is a CCR surface impoundment. Thus, Dominion should have performed an assessment of the Historic Pond, as required by the Assessment Law.¹⁰ Rather than comply however, Dominion has limited its assessment to the Bottom Ash Pond. But there is no meaningful factual distinction between the Bottom Ash Pond and Historic Pond. Both ponds were used to treat, store, and dispose of coal ash and liquids, both are unlined, and both sit in low-lying areas, in contact with the groundwater, and vulnerable to flooding and storm surges. In fact, the Bottom Ash Pond was constructed in an area that used to be part of the Historic Pond. Yet nowhere in the assessment does Dominion even identify that 2.1 million tons of ash sits in the unlined Historic Pond, providing only oblique and misleading references to a “landfill footprint.”¹¹ The Historic Pond is not a “landfill footprint”; it is a collection of three settling ponds that Dominion used for 30 years, and that now contain roughly two-thirds of the ash at the entire site. Like the Bottom Ash Pond, the Historic Pond is precisely the sort of coal ash for which the General Assembly required an assessment, yet Dominion provided none.

After reading Dominion’s assessment and listening to its presentation to the State Water Commission, many people believed Dominion had agreed to fully excavate the ash at the Chesapeake site, since the assessment only assesses the Bottom Ash Pond. In reality, Dominion has agreed to excavate just two percent of the ash at Chesapeake. Dominion appears content to leave the public in the dark about Chesapeake, failing to provide the critical information required by the Assessment Law.

Dominion’s failure to provide the public with this information is particularly troubling, as the Historic Pond represents some of the most vulnerable ash in the state; the pond is unlined, with portions laying six feet below sea level, sitting in and saturated by groundwater. Moreover, the District Court has already ruled that the Historic Pond (along with the Bottom Ash Pond and Ash Landfill) is releasing arsenic into the surrounding waterways in violation of the Clean Water Act. In fact, the District Court ruled that Dominion is discharging arsenic into the surface water at Chesapeake at “levels higher than the Surface Water Protection (“SWP”) standard, set by the

¹⁰ Dominion has claimed publicly that the Historic Pond was “closed” when the Ash Landfill was constructed. *See* Zullo, R., Richmond Times-Dispatch, Critics take aim at Dominion’s coal ash assessment (Dec. 24, 2017). Whatever Dominion means by “closed”—there are no such formal closure documents—the point is irrelevant. Although Dominion no longer added ash to the unlined lagoons after 1984, the definition of “inactive CCR surface impoundments” means impoundments “that no longer received CCR on or after October 19, 2015 and still contain[] both CCR and liquids on or after October 19, 2015.” 40 C.F.R. § 257.53. Certainly the unlined lagoons, like the bottom ash pond, no longer received ash as of October 2015, and these lagoons still contain both CCR and liquids after October 2015. The same is true for the Bottom Ash Pond, which no longer received ash as of October 2015 and which Dominion has acknowledged is subject to the CCR Rule and the Assessment Law. Both the Bottom Ash Pond and the Historic Pond are “inactive CCR surface impoundments.”

¹¹ Assessment at 7-6.

Commonwealth of Virginia, of 36 micrograms per liter.”¹² Dominion, however, fails even to mention this factual ruling in its discussion of the surface water at Chesapeake.¹³ Instead, Dominion simply states that its surface water sampling fell within the applicable standards, a statement that only reflects the fact that a large river can dilute discharges quickly. As the District Court has already held, “[t]he dilution of pollution does not render it acceptable.”¹⁴ The fact remains that Dominion is discharging arsenic into the rivers surrounding Chesapeake at concentrations greater than the Virginia’s surface water protection standards.¹⁵

Not only is it established that Dominion’s coal ash at Chesapeake is polluting our rivers with arsenic, but the District Court has already rejected two of Dominion’s remedial approaches, including the installation of a simple cap. First, the District Court rejected Dominion’s initial remedial approach—“monitored natural attenuation”—describing it as “a scientific or regulatory term that means, ‘Do nothing.’”¹⁶ In rejecting this approach, the court explained:

Essentially, Dominion would keep an eye on the amount of arsenic at the site, while waiting for the arsenic to bond chemically with naturally occurring iron in the sediments at CEC. The resulting molecules are apparently not poisonous. The evidence shows, however, that MNA has not occurred so far, that if MNA does work it will take a very long time, and that MNA may never get rid of the arsenic in the groundwater.¹⁷

It is certainly notable, that despite this rejection of monitored natural attenuation as a failed “do nothing” approach at Chesapeake, Dominion chooses to list monitored natural attenuation as a potential “remedial” option for Brems, Chesterfield, and Possum Point.

Second, the District Court also rejected Dominion’s original cap-in-place plan at Chesapeake. After hearing evidence that installing a cap would not stop the pollution at Chesapeake, the District Court ordered that Dominion may not “only cap the coal ash in place,”¹⁸ explaining at a hearing that “cap in place is clearly not an acceptable answer here.”¹⁹

¹² *Sierra Club*, 247 F. Supp. 3d at 759-60.

¹³ *See, e.g.*, Assessment at 7-8.

¹⁴ *Sierra Club*, 247 F. Supp. 3d at 765-66.

¹⁵ These facts are not in dispute. While Dominion has appealed the District Court’s holding that Dominion is in violation of the Clean Water Act as a legal matter, it has not appealed any of the court’s factual findings.

¹⁶ *Id.* at 760.

¹⁷ *Id.*

¹⁸ *Sierra Club v. Va. Elec. & Power Co.*, Civ. No. 2:15-CV-112, Dkt. No. 220, Amended Order (July 31, 2017).

¹⁹ *Sierra Club v. Va. Elec. & Power Co.*, Civ. No. 2:15-CV-112, Hearing (June 20, 2017), at p. 6.

II. DOMINION’S CHESTERFIELD, POSSUM POINT, AND BREMO SITES ARE POLLUTING THE SURROUNDING RIVERS, AND A CAP WILL NOT STOP THIS POLLUTION.

As presented in the attached Aquilogic reports, the data clearly shows that Dominion’s ash at Brema, Possum Point, and Chesterfield, is in contact with and polluting the groundwater, which then discharges directly to the surrounding rivers. Moreover, given each sites’ characteristics, installing a “cap” would not stop this ongoing pollution; rather these sites will continue polluting our rivers indefinitely.

Dominion made no effort to analyze these fundamental issues. Dominion did not, for example, seek to understand whether the ash at its sites is in contact with groundwater, or whether the contaminated groundwater discharges to the surrounding rivers. Instead, Dominion simply assumes that the groundwater pollution at all of its sites is limited to areas “adjacent to the ash ponds,” since surface water tests do not reveal high levels of contaminants.²⁰ But, as described above for Chesapeake, surface water samples taken far from the point of discharge have no bearing on whether such discharges are occurring; instead such samples reflect the fact that dilution occurs quickly in large rivers.²¹

Similarly, Dominion assumes that a cap will work, without providing any site-specific analysis that addresses each site’s specific pollution issues. In essence, Dominion only “assesses” whether remedial options like capping in place could be constructed at the sites.²² While certainly construction feasibility is an important consideration, equally important is whether these engineering solutions will actually stop the coal ash from continuing to pollute groundwater and rivers, and remediate the existing pollution. This critical analysis is absent from Dominion’s assessment, but Aquilogic’s reports show that a cap will not prevent discharges from occurring at these sites. Even if a “perfect” cap could be installed, groundwater will continue to be contaminated by Dominion’s coal ash, and this contaminated groundwater will continue to discharge to the surrounding rivers.

A. Brema Power Station

Dominion’s Brema Power Station is located on the James River in Fluvanna County, Virginia.²³ Dominion burned coal at Brema from 1931 until 2014 when it was converted to natural gas.²⁴ The coal ash generated at Brema was placed into three on-site impoundments known as the East, West, and North Ponds.²⁵ None of these ponds are lined.²⁶ Dominion has

²⁰ See, e.g., Assessment at 4-8, 6-16, TM 6 1-4

²¹ See Attachment B at 12.

²² See Assessment, Technical Memorandum 7, Groundwater Corrective Measures.

²³ Attachment B at 6.

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

nearly completed consolidating ash from the East and West Ponds into the North Ash Pond, which ultimately will hold approximately 6.2 million cubic yards of coal ash.²⁷

The North Ash Pond was constructed by building an earthen dam across the outlet of an unnamed tributary of the James River.²⁸ The dam is approximately 96 feet tall, and has resulted in a significant hydraulic head forming in the North Ash Pond; groundwater flows through and beneath the pond, continues down this gradient, and then discharges directly into the James River.²⁹ Importantly, the ash in the pond is contaminating the groundwater through direct contact. Sampling data shows that the groundwater contains a number of contaminants from the coal ash, including boron, sulfate, total dissolved solids, lithium, molybdenum, and others. This contaminated groundwater then discharges into the James River.³⁰

If a cap were installed over the North Ash Pond, these discharges would continue to pollute the James River. Rainwater would still infiltrate the cap, but more importantly, the cap would not prevent upgradient groundwater from continuing to flow through the ash pond.³¹ In other words, the coal ash will remain in contact with the water table, thereby contaminating the groundwater which then flows directly into the James River. This pollution is likely to continue for many centuries, essentially in perpetuity.³²

B. Possum Point Power Station

Dominion's Possum Point Power Station is located in eastern Prince William County, on a peninsula that separates Quantico Creek from the Potomac River.³³ The plant began burning coal in 1955. Dominion placed the resulting coal ash waste in various coal ash settlement ponds, including Ash Ponds A, B, C, D, and E, until it ceased burning coal in 2003.³⁴ Dominion has nearly completed consolidating ash from several ponds into Ash Pond D,³⁵ which ultimately will hold approximately 4 million cubic yards of coal ash.³⁶

Groundwater flows through and beneath the coal ash waste stored in Ash Pond D.³⁷ In fact, approximately 31 to 70 feet of the ash in Ash Pond D is in continual contact with groundwater.³⁸ A slurry wall was apparently installed 30 years ago, although documentation for its installation is largely missing, and no efforts have been made to ensure it is working as intended.³⁹ The groundwater contamination, however, shows that even if a slurry wall was

²⁷ *Id.* at 6-7.

²⁸ *Id.* at 2, 7.

²⁹ *Id.* at 2-3, 7.

³⁰ *Id.* at 4.

³¹ *Id.* at 5, 14.

³² *Id.* at 14.

³³ Attachment C at 5.

³⁴ *Id.* at 5.

³⁵ *Id.* at 1-2.

³⁶ Assessment 9-1.

³⁷ Attachment C at 2.

³⁸ *Id.* at 2.

³⁹ *Id.* at 3.

installed, it is not working.⁴⁰ The groundwater downgradient of Ash Pond D has been contaminated with a number of coal ash constituents, including arsenic, boron, cadmium, calcium, chloride, cobalt, lithium, manganese, nickel and others.⁴¹ This contaminated groundwater flows directly into Quantico Creek and other surface water bodies.⁴²

As with Bremono, a cap will not stop the ongoing pollution at Possum Point. Groundwater will continue to flow through Ash Pond D even after installation of a cap, and some rainwater would percolate through the cap and coal ash, thereby recharging the groundwater.⁴³ Given the large volume of coal ash in Ash Pond D, this pollution will continue for many decades and possibly centuries.⁴⁴

C. Chesterfield Power Station

Dominion's Chesterfield Power Station is located on the James River and is the largest fossil-fuel burning power plant in Virginia.⁴⁵ Dominion has burned coal since at least 1944 and has deposited coal ash primarily in two large ash ponds known as the Upper and Lower Ash Ponds.⁴⁶ The ponds are located immediately adjacent to the Dutch Gap Conservation Area, a tidal lagoon in the conservation area, and the "Old Channel" of the James River (also known as Farrar Gut).⁴⁷ The Lower Ash Pond contains approximately 3.6 million cubic yards of ash while the Upper Ash Pond contains approximately 11.3 million cubic yards.⁴⁸

The ponds at Chesterfield are situated within an active river system.⁴⁹ Evidence shows that the groundwater from each ash pond flows towards the adjacent surface water bodies, including the Old Channel.⁵⁰ This groundwater is in contact with at least five feet of ash in the Upper Pond and at least 12 feet of ash in the Lower Ash Pond.⁵¹ Due to these groundwater conditions, the coal ash stored in both ponds is contaminating the groundwater with pollutants such as boron, radium 226/228, arsenic, cobalt, and nickel.⁵² This contaminated groundwater then flows directly into the surrounding surface water, including the Old Channel.⁵³ The discharge to surface waters is established not only by Dominion's own data, but further

⁴⁰ *Id.* at 3.

⁴¹ *Id.*

⁴² *Id.* at 3-4.

⁴³ *Id.* at 4.

⁴⁴ *Id.* at 4-5.

⁴⁵ Attachment D at 6-7.

⁴⁶ *Id.* at 7.

⁴⁷ *Id.*

⁴⁸ *Id.* at 8.

⁴⁹ *Id.* at 4.

⁵⁰ Attachment D, at 2.

⁵¹ *Id.* at 2-3.

⁵² *Id.* at 3.

⁵³ *Id.* at 3.

confirmed by sampling performed by the SELC and the James River Association in the adjacent Dutch Gap Conservation Area.⁵⁴

Installing a cap will not stop the ongoing pollution at Chesterfield.⁵⁵ Contaminated groundwater will continue to discharge to the surface waters due to (a) water percolating through the cap, (b) water percolating through embankments not covered by the cap, (c) the groundwater continuing to flow from the north through the Lower Ash Pond, and (d) tidal pulsing within the Upper Ash Pond—which results in contaminated groundwater discharging for about 12 hours each day and fresh surface water recharging the groundwater for the remaining 12 hours of the day.⁵⁶

Dominion’s assessment also fails to fully consider the risks associated with the leaving the ash in this active river system. As Aquillogic explains, the Chesterfield ash ponds are at significant risk from a major flood event:

[T]here is the potential that, at some point in the future, the James River may seek to reestablish its course through the Dutch Gap Conservation Area during a major flow event (e.g., a major flood associated with high rainfall and a high tidal surge). Even if the course is not established, there would likely be severe erosion during such an event. This could have a catastrophic impact on the ash ponds, from either erosion of the embankments and direct discharge of some coal ash waste into the River to complete erosion of the coal ash waste and flow downstream of the river.

For example, on June 23, 1972 during Hurricane Agnes, flow in the James River at Richmond peaked at 313,000 cubic feet per second (cfs), ten times higher than regular annual storm flows (NOAA, 2017). The James River rose over 28 feet or almost 17 feet above flood stage (NOAA, 2017). Such an event would completely submerge the Lower Ash Pond and most of the Upper Ash Pond and cause severe erosion and discharge of coal ash waste into the James River. Therefore, there is a risk of a catastrophic failure at the ash ponds should they be left in-place in such an active hydrologic system.⁵⁷

Although Dominion acknowledges that the Virginia Department of Conservation and Recreation categorizes the Lower and Upper Ash Pond dams as “high hazard,”⁵⁸ it nonetheless downplays the risk of failure. Contrary to Dominion’s assertions,⁵⁹ installing a thin synthetic liner covered by a thin layer of soil will not prevent failure in the face of the severe erosive forces present

⁵⁴ *Id.*

⁵⁵ *Id.* at 5-6, 18-20.

⁵⁶ *Id.*

⁵⁷ *Id.* at 4.

⁵⁸ Assessment, Technical Memorandum 5 at 4-5.

⁵⁹ *Id.* at 4-7.

during a major flood event. Even Dominion admits such breach “would lead to economic and environmental damage.”⁶⁰ As discussed later, these sorts of risks are not factored into Dominion’s distorted cap in place cost estimates; the true cost is likely much higher when factoring in the long-term risks as well as public health impacts.

III. DOMINION FAILED TO CONSIDER REALISTIC CLEAN CLOSURE OPTIONS, SKEWING THE ASSESSMENT IN FAVOR OF CAP IN PLACE.

Dominion’s assessment takes an unrealistic and impractical “all or nothing” approach to clean closure options. For example, if Dominion believed an on-site landfill could not be constructed large enough to contain all of a site’s ash, then it dismissed this option in its entirety. Dominion did not consider, for example, whether an on-site landfill could be constructed to contain *some* of the ash, and whether the remainder could be recycled or transported to an off-site landfill—a feasible option that would likely be significantly cheaper than the “all or nothing” options presented by Dominion. Dominion’s “all or nothing” approach skews the results in favor of a cap-in-place, yet it has no real-world basis and is contrary to what is already happening in our region.

In particular, Dominion dismissed viable on site landfilling options at Chesterfield as “not feasible,” when in fact these options could contain most of the ash in the Upper and Lower Ash Ponds. For example, Dominion has constructed a new, permitted landfill on site, but dismisses out of hand using any of this landfill space for its already-ponded ash since the landfill is only 9.4 million cubic yards, and the two ponds contain 14.9 million cubic yards.⁶¹ This simplistic dismissal fails to analyze whether the new landfill could be used to contain *some* of the ponded ash, with the remainder being recycled or landfilled elsewhere. Capacity in the new landfill would be freed up when Dominion decides to retire any of the coal-fired units at Chesterfield—which range from 49 to 66 years old—an event that may happen in the near future given the age of these units and operational costs. Dominion could also free up capacity by committing to reuse more of its newly produced ash, rather than putting it in the landfill. Not only would using a portion of the new landfill likely result in a significantly lower cost, it would also shorten the timeline for closure since much of the ash would be able to remain on site.

At Possum Point, Dominion also dismissed viable options. For example, Dominion dismissed constructing a landfill on a greenfield area because the “largest undeveloped area is approximately 25 acres”—and according to Dominion, it would need 50 acres of land to fully contain all of the ash at Possum Point.⁶² Dominion again fails to explain why it did not consider constructing such a landfill, while recycling the remainder or landfilling it elsewhere. As with Chesterfield, this more flexible, real-world approach to closure would likely result in a significantly reduced cost and reduced timeline.

Dominion also failed to consider building more than one recycling facility—an option that would essentially halve the processing time, greatly reducing the inflated timelines Dominion presents. As discussed below, contrary to Dominion’s assertions, the data shows a

⁶⁰ *Id.* at 4-5.

⁶¹ Assessment at 8-9.

⁶² *Id.* 9-10.

strong market for Dominion’s ash—potentially supporting multiple recycling facilities to meet demand—but this option was not considered.

Dominion also overstates the time needed for constructing a new off-site landfill. As Dominion acknowledges, the most efficient way to do so would be to identify parcels that are already preliminarily zoned for waste acceptance—which would “potentially save 3 to 5 years from the timeline . . .”⁶³ But Dominion does not appear to have assessed this “streamlined” approach, instead assuming the project would take the maximum amount of time.⁶⁴

In terms of the effectiveness of clean closure, Dominion also incorrectly claims throughout its assessment that the benefits of clean closure “would not be realized until the removal and beneficiation was completed and the groundwater naturally attenuated over time.”⁶⁵ Real world experience, however, shows that beginning the process of removing the source material can provide immediate benefits. For example, when Santee Cooper began excavating ash at one of its sites in South Carolina, arsenic levels in the groundwater dropped by as much as 90 percent—even though the excavation was only partially complete.⁶⁶ Likewise, arsenic levels dropped by as much as 80 percent at another South Carolina site after partial excavation.⁶⁷

Dominion also makes several disingenuous characterizations of clean closure options, in a further attempt to buttress a cap-in-place approach. These characterizations are misplaced, and also misstate the risks associated with cap in place. For example, Dominion claims that clean closure would result in extra risk, since the sites would remain open for longer than cap-in-place.⁶⁸ This is not true. First, sites can be managed with temporary covers and stormwater systems. Second, the benefits of excavation are likely to be realized even after only some of the ash has been removed, as described above. Third, even if sites are left open for several more years as compared to capping, clean closure permanently removes the source and eliminates the risk forever. Installing a cap, on the other hand, will mean these sites will continue to pollute our rivers indefinitely even if nominally “closed.”

Taken together, Dominion’s numerous flawed assumptions and biased approaches result in unrealistic timelines and costs for clean closure options. In South Carolina, for example, the utilities there have committed to excavating every unlined coal ash lagoon; such ash will be recycled or transported to modern, lined landfills.⁶⁹ In just a few years since the decision, the utilities have already excavated nearly 6 million tons of ash for recycling or proper landfilling, with an additional 14 million tons to be removed “within the next decade.”⁷⁰ In other words,

⁶³ See, e.g., *id.* at 4-7, 6-10, 8-13, 9-12.

⁶⁴ *Id.* 4-6 to 4-7.

⁶⁵ See, e.g., *id.* at 6-7, 6-13.

⁶⁶ Wren, D., The Post and Courier, South Carolina utilities lead the region in efforts to clean up coal ash pollution (Jul. 15, 2017).

⁶⁷ *Id.*

⁶⁸ See, e.g., Assessment at ES-5 to ES-11.

⁶⁹ Wren, D., The Post and Courier, South Carolina utilities lead the region in efforts to clean up coal ash pollution (Jul. 15, 2017).

⁷⁰ *Id.*

South Carolina will either recycle or properly landfill nearly 20 million tons of ash in less than 15 years total.

Similarly, in North Carolina, Duke Energy is being required to clean close a number of its impoundments. In just several years of progress, Dominion already has more than 12 million tons of coal ash out of the ground.⁷¹ At Duke's H.F. Lee Site, for example, up to 6 million tons will be recycled for use in concrete over the next 10 years; whatever cannot be recycled will be landfilled off-site.⁷²

These real world numbers stand in stark contrast to Dominion's timelines. For example, while 6 million tons of ash will be recycled at the H.F. Lee Site in just 10 years, Dominion claims that the approximately 6 million tons of ash at Bremono could take 27 years to recycle.⁷³ While South Carolina and North Carolina already have 6 million and 12 million tons out of the ground, respectively, in just several years, Dominion claims it could take 13 years to landfill the 6 million tons at Bremono or 29 years to landfill the 15 million tons of ash at Chesapeake.⁷⁴ Dominion's timelines are simply not credible. They are a product of invented restrictions, not real-world analysis.

IV. THERE IS STRONG AND GROWING DEMAND FOR DOMINION'S ASH.

A key element of the Assessment Law was the evaluation of safe ash recycling options. Dominion has not, however, provided a fair or credible evaluation of such options in Virginia.

As detailed in their report, Dr. Kevin Gardner and Scott Greenwood at the University of New Hampshire conclude that Dominion's assessment has not provided a credible analysis of the beneficial reuse of coal ash.⁷⁵ Dominion made a number of unjustified and unsubstantiated assumptions—all of which skew towards artificially limiting the market for Dominion's ash. For example, Dominion assumes that the transportation costs are too high to make recycling ash economic if the ash has to be transported more than 50 miles.⁷⁶ This assumption is not grounded in data.⁷⁷ In fact, this 50-mile limitation contradicts data and survey responses included in Dominion's own assessment.⁷⁸ Ash is being imported into Virginia from many places that are more than 50 miles away, including South Carolina, West Virginia, Pennsylvania, Georgia,

⁷¹ Duke Energy, Duke Energy Coal Plants and Ash Management, *available at* https://www.duke-energy.com/_/media/pdfs/our-company/ash-management/duke-energy-ash-metrics.pdf?la=en (last visited Jan. 17, 2018).

⁷² Downey, J., Charlotte Business Journal, Duke Energy to recycle coal ash from shuttered Goldsboro plant (Dec. 13, 2016).

⁷³ Assessment at ES-5.

⁷⁴ Assessment at ES-7.

⁷⁵ Attachment E, Kevin H. Gardner & Scott Greenwood, University of New Hampshire, Response to Dominion Energy Report entitled: Senate Bill 1398 Response, Coal Combustion Residuals, Ash Pond Closure Assessment (Jan. 2018).

⁷⁶ Attachment E at 3-4.

⁷⁷ *Id.*

⁷⁸ *Id.*

Tennessee, Ohio, and even India.⁷⁹ In fact, survey respondents even reported that 350 miles is a feasible transportation distance.⁸⁰ Dominion’s spurious 50-mile assumption results in an assessment that arbitrarily limits the market for its ash.⁸¹

Dominion also makes the basic error of conflating costs (transportation costs to its end use) with the price that Dominion would be paid for the ash.⁸² Dominion claims that “[c]ompetitive purchase price for fly ash meeting ASTM C618 standards typically ranges from \$30 to \$60 per ton with added transportation costs of \$7 to \$33 per ton (total \$37 to \$93 per ton), and fly ash was reported to be transported between 60 and 200 miles.”⁸³ Contrary to Dominion’s calculation, the price of the ash and the transportation costs would be off-setting, not additive. Selling the recycled ash helps *offset* some of the cost of excavating the ash ponds and constructing a beneficiation facility.⁸⁴ By making this simple error, Dominion has significantly inflated the cost estimate for closure by beneficial use.⁸⁵

Dominion also relies exclusively on an anecdotal conversation as support for its claim that ash supply will outpace demand.⁸⁶ Dominion provides no data or other support for this estimate, and no explanation for how it was derived.⁸⁷ The actual data—data that is even included in Dominion’s assessment—shows that Dominion’s reliance on this unsubstantiated claim is unjustified.⁸⁸ Instead, the demand for ash in the region (North Carolina, South Carolina, and Virginia) is substantial and will continue to grow—2.9 million tons per year in 2020-2024, growing to 3.5 million tons per year in 2025-2030.⁸⁹

In addition, Dominion conflates individual customer needs with market “variability.” This conflation is unreasonable, and belies the strong demand for ash based on existing data and analysis.⁹⁰ In its market study, Dominion also assumes that transportation will occur by truck, despite the fact that rail access could be used to serve a regional recycling facility.⁹¹ Dominion’s market study also ignores the market for ash in cement production; in Virginia, up to 200,000 tons of ash could be used in cement, a use which does not require the same level of beneficiation as concrete uses.⁹²

These errors and unjustified assumptions render Dominion’s statements about ash demand not credible. Instead, the data shows a strong and growing demand for ash in the region.

⁷⁹ *Id.*

⁸⁰ *Id.* at 4.

⁸¹ *Id.*

⁸² *See* Assessment, Technical Memorandum 1 at 2-2.

⁸³ *Id.*

⁸⁴ Attachment E at 8.

⁸⁵ *Id.*

⁸⁶ *Id.* at 4-5.

⁸⁷ *Id.* at 4.

⁸⁸ *Id.* at 5.

⁸⁹ *Id.*

⁹⁰ *Id.* at 6.

⁹¹ *Id.* at 7-8.

⁹² *Id.*

Recycling ash for concrete and cement would not only permanently prevent a potential environmental catastrophe, but it would also create local jobs and tax revenue, and fulfill a local manufacturing need. It is a sensible solution that would work for Virginia, just as it is working in North Carolina and South Carolina.

V. CLEAN CLOSURE IS LIKELY TO BE CHEAPER IN THE LONG-RUN.

Dominion provides almost no detail about its cost estimates. The lack of this information renders it impossible to meaningfully analyze Dominion's work and assumptions. Moreover, as described in the previous section, Dominion's cost estimates for beneficial reuse options are significantly inflated by virtue of Dominion's error in addressing transportation costs.

Beyond these fundamental issues, Dominion misstates what even its own, skewed numbers show. In fact, using Dominion's own numbers, clean closure of the sites could be accomplished for as little as \$2.26 billion, while even Dominion acknowledges that leaving the ash in unlined pits may be as high as \$1.86 billion.⁹³ Thus, it is false for Dominion to claim that clean closure options are "an order-of-magnitude greater than closure-in-place."⁹⁴

But more importantly, Dominion's cap-in-place costs do not reflect the true costs and risks associated with such a plan. Dominion's costs merely reflect construction estimates. The cap-in-place costs do not reflect the public health and environmental costs associated with allowing the pollution from these sites to flow indefinitely. The cap-in-place costs do not reflect the costs that could arise from a potential catastrophe when an earthen dam is washed out during a storm surge or flood. The cap-in-place costs do not reflect the costs of subsequent remedial measures that Dominion may need to install in the event the cap proves ineffective.

In fact, the cap-in-place costs do not reflect the real possibility that Dominion will be forced to excavate these sites anyways if and when the cap proves ineffective at remediating the contamination. Dominion acknowledges, as it must, that all of these sites have significant groundwater contamination. Moreover, the evaluation by Aquilogic, as well the District Court's ruling in Chesapeake, demonstrate that all of the sites are discharging coal ash contaminants into the surrounding rivers and that a cap-in-place approach will not stop this pollution. Thus, if Dominion elects to cap these sites, but the cap fails to resolve the existing groundwater and surface water contamination in accordance with applicable standards under federal and state law, it may be required to excavate these sites anyways.⁹⁵ In other words, selecting the cheap cap-in-place option now could result in essentially double closure costs.

CONCLUSION

Regionally, utilities have committed to excavate 90 million tons of coal ash, placing it in modern, permitted landfills, or repurposing it for use in cement or concrete. Dominion, on the other hand, appears poised to leave virtually all of its coal ash in leaking, unlined pits.

⁹³ See Assessment at ES-5 to ES-11.

⁹⁴ *Id.* at ES-2.

⁹⁵ See 40 C.F.R. §§ 257.97, 257.98, 257.101, 257.102, as incorporated into Virginia Solid Waste Management Regulations.

Dominion's biased and inaccurate assessment, skewed toward this cap-in-place approach, will ensure Virginians remain at risk for generations.

Sincerely,

A handwritten signature in black ink, appearing to read "Nathaniel H. Benforado". The signature is fluid and cursive, with the first name being the most prominent.

Nathaniel H. Benforado
Southern Environmental Law Center

cc:

Delegate Jennifer Carroll Foy (D-District 2)

Enclosures:

Attachment A, Dominion Putting Virginia at Risk

Attachment B, Aquilologic, Technical Memorandum, Review of Groundwater Conditions, North Ash Pond at Dominion's Bremo Power Station (Jan. 15, 2018)

Attachment C, Aquilologic, Technical Memorandum, Review of Groundwater Conditions, Ash Pond D at the Possum Point Power Station (Jan. 15, 2018)

Attachment D, Aquilologic, Technical Memorandum, Review of Groundwater Conditions, Coal Ash Waste Ponds at Chesterfield Power Station (Jan. 15, 2018)

Attachment E, Kevin H. Gardner & Scott Greenwood, University of New Hampshire, Response to Dominion Energy Report entitled: Senate Bill 1398 Response, Coal Combustion Residuals, Ash Pond Closure Assessment (Jan. 2018)