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## **Via Electronic Mail**

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Knoxville, Tennessee 37902  
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**Re: TVA's Noncompliance with Federal Coal Ash Rule at the Colbert Fossil Plant**

Dear Ms. Birdwell:

On behalf of the Southern Environmental Law Center, Alabama Rivers Alliance, Shoals Environmental Alliance and Tennessee Riverkeeper, we are calling on the Tennessee Valley Authority (TVA) to comply with the federal Coal Ash Rule ("Coal Ash Rule" or "Rule") at its Colbert Fossil Plant (Colbert) in northwest Alabama. The Coal Ash Rule requires utilities to meet minimum national criteria to ensure that coal ash landfills and surface impoundments are not adversely affecting health and the environment.<sup>1</sup> A facility that does not operate in compliance with the Rule is deemed an open dump under the Resource Conservation and Recovery Act (RCRA).<sup>2</sup> TVA has failed to comply with the Coal Ash Rule with respect to Ash Ponds 1, 4 and 5 at the Colbert Fossil Plant. Therefore, TVA is operating open dumps at Colbert in violation of the Coal Ash Rule.

The documents posted on TVA's Coal Combustion Residuals (CCR) compliance website for the Colbert Plant, or lack thereof, together with TVA's consultant reports and its closure plans, demonstrate that TVA is violating the Coal Ash Rule in key aspects at the Colbert site. TVA has failed to identify Ash Pond 1 and Ash Pond 5 as subject to the Coal Ash Rule and failed to post all of the required compliance documents for them, despite both ash ponds being inactive coal ash ponds that are subject to regulation under the Rule. The actions taken by TVA in abandoning Ash Pond 1 and closing Ash Pond 5 fail to satisfy the applicable performance standards under the Rule. Furthermore, TVA has failed to post the required factor of safety assessment for Ash Pond 4, and the closure plan that TVA has posted for Ash Pond 4 fails to

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<sup>1</sup> U.S. EPA, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, 80 Fed. Reg. 21,302 (Apr. 17, 2015); *as amended* by Technical Amendments to the Hazardous and Solid Waste Management System, Disposal of Coal Combustion Residuals from Electric Utilities—Correction of the Effective Date, 80 Fed. Reg. 37,988 (July 2, 2015); 40 C.F.R. §§ 257.50–.107.

<sup>2</sup> 42 U.S.C. § 6944 (requiring EPA to promulgate regulations distinguishing sanitary landfills from open dumps); 40 C.F.R. § 257.2 ("Open dump means a facility for the disposal of solid waste which does not comply with this part"); *id.* § 257.50 (invoking open dump authority to establish minimum federal criteria for landfills and surface impoundments that manage or dispose of coal ash).

demonstrate that its plans to cap the coal ash in place satisfy the applicable performance standards under the Rule.

## **I. The Coal Ash Rule**

Effective October 19, 2015, the U.S. Environmental Protection Agency (EPA) published the Coal Ash Rule under subtitle D of RCRA, which regulates the disposal of solid waste.<sup>3</sup> Under RCRA, any violation of the requirements of the Coal Ash Rule constitutes illegal open dumping.<sup>4</sup>

### **A. Coal Ash Rule Definitions**

The Coal Ash Rule applies to both new and existing surface coal ash landfills and surface impoundments, as well as inactive surface impoundments at active electric utilities.<sup>5</sup> The Rule defines “active electric utility” as “any facility subject to the requirements of this subpart that is in operation on October 19, 2015.”<sup>6</sup> A “CCR surface impoundment” is defined as a “natural topographic depression, man-made excavation, or diked area, which is designated to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR.”<sup>7</sup> An “inactive CCR surface impoundment” is a “CCR surface impoundment that no longer receives CCR on or after October 19, 2015 and still contains both CCR and liquids on or after October 19, 2015.”<sup>8</sup> Inactive surface impoundments are subject to all of the requirements applicable to existing CCR surface impoundments.<sup>9</sup> A “CCR landfill” means “an area of land or an excavation that receives CCR and which is not a surface impoundment . . . .”<sup>10</sup>

### **B. Operating Record**

Under the Rule, an owner/operator of a CCR unit must maintain certain information in a written operating record.<sup>11</sup> Files that must be included in the operating record include closure plans, post-closure plans, history of construction, and various design and operating criteria.<sup>12</sup> After the required information is placed in the operating record, it must then be placed on a publicly accessible Internet site within 30 days.<sup>13</sup> Subject to certain exceptions not relevant at Colbert, an inactive surface impoundment is required to meet the same deadlines as existing surface impoundments.<sup>14</sup>

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<sup>3</sup> 80 Fed. Reg. at 21,312; 40 C.F.R. §§ 257.50–.107.

<sup>4</sup> 40 C.F.R. § 257.1(a)(2) (“Practices failing to satisfy *any of the criteria* in . . . §§ 257.50 through 257.107 constitute open dumping.”(emphasis added)); *see also id.* § 257.2 (“Open dump means a facility for the disposal of solid waste which does not comply with this part.”).

<sup>5</sup> *Id.* § 257.50.

<sup>6</sup> *Id.* § 257.53.

<sup>7</sup> *Id.*

<sup>8</sup> *Id.*

<sup>9</sup> *Id.* § 257.100(a).

<sup>10</sup> *Id.* § 257.53.

<sup>11</sup> *Id.* § 257.105.

<sup>12</sup> *See id.* §§ 257.102(b), .104(d), .73.

<sup>13</sup> *Id.* § 257.107(d).

<sup>14</sup> *Id.* § 257.100.

### C. Safety Factor Assessments

Under § 257.73(e) of the Coal Ash Rule, the owner of an inactive or existing surface impoundment is required to conduct safety factor assessments and document whether the safety factors are met for the critical cross section of the embankment. The Rule defines factor of safety as “the ratio of the forces tending to resist the failure of a structure to the forces tending to cause such failure as determined by accepted engineering practice.”<sup>15</sup> It requires the following safety factors:

- (i) The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.
- (ii) The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.
- (iii) The calculated seismic factor of safety must equal or exceed 1.00.
- (iv) For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.<sup>16</sup>

Owners or operators were required to complete these initial assessments no later than October 17, 2016 and post them on the CCR website by November 17, 2016.<sup>17</sup> “This analysis is used to determine whether a CCR surface impoundment’s dikes are engineered to withstand the specific loading conditions that can be reasonably anticipated to occur during the lifetime of the unit without failure of the dike, if accepted good engineering practices are employed.”<sup>18</sup> The static factor of safety is used to determine whether the dikes would remain stable under static loading conditions, while the seismic factor of safety determines whether a dike would remain stable during an earthquake or other seismic event.<sup>19</sup> The liquefaction factor of safety is “the factor of safety determined using analysis under liquefaction conditions,” and liquefaction occurs when “the effective stress of the soils reduces to zero, corresponding to a total loss of shear strength of the soil.”<sup>20</sup> This requirement applies to all inactive and existing surface impoundments, regardless of whether the owner/operator has already decided to close them.

### D. Closure Plans

Section 257.102 of the Rule requires owners or operators to prepare an initial written closure plan for each surface impoundment, like Ash Pond 1, Ash Pond 4 and Ash Pond 5 at Colbert. The Rule provides two options for closure, either removal of the ash, also described as clean closure, or leaving the ash in place, sometimes called “cap in place.” If the owner proposes to cap the ash in place, the closure plan must “discuss how the final cover system will achieve the performance standards specified in paragraph (d) of this section.”<sup>21</sup>

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<sup>15</sup> *Id.* § 257.53.

<sup>16</sup> *Id.* § 257.73(e)(i)–(iv).

<sup>17</sup> *Id.* §§ 257.73(f); 257.107(d).

<sup>18</sup> 80 Fed. Reg. at 21,316.

<sup>19</sup> *Id.*

<sup>20</sup> *Id.* at 21,317.

<sup>21</sup> 40 C.F.R. § 257.102(b).

In the closure plan, the owner/operator must demonstrate that if the ash is left in place, it will achieve the following performance standards requirements to:

- “Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids in the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere”;<sup>22</sup>
- “Preclude the probability of future impoundment of water, sediment, or slurry”;<sup>23</sup> and the requirement that
- “Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.”<sup>24</sup>

Thus, if an owner proposes to close a surface impoundment by leaving the ash in place with a cover, the closure plan must demonstrate that groundwater will not continue to flow through the ash, in order to satisfy the requirement to “[c]ontrol, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of coal ash, leachate, or contaminated run-off to the ground or surface waters.”<sup>25</sup>

The closure plan must also “[p]reclude the probability of future impoundment of water, sediment, or slurry.”<sup>26</sup> If groundwater will remain in the coal ash basin, the basin remains an impoundment that stores an accumulation of coal ash and liquids.

Finally, if groundwater will continue to saturate coal ash within the proposed “cap in place” storage area, then the closure plan cannot satisfy the requirement that “[f]ree liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.”<sup>27</sup> “Free liquids” are defined under the Coal Ash Rule as “liquids that readily separate from the solid portion of a waste under ambient temperature and pressure.”<sup>28</sup> Groundwater that saturates coal ash in an unlined impoundment is free liquid that readily separates from the solid portion of the waste. Groundwater readily separates from coal ash because it flows *through* the coal ash, as shown by the movement of pollutants out of unlined coal ash impoundments into the surrounding groundwater; it does not remain in the coal ash indefinitely, but the levels of groundwater change, flowing in and out of the basin as the groundwater rises and falls. For this reason, a closure plan that fails to stop the ongoing flow of groundwater into an unlined basin will violate this provision of the Rule because it does not eliminate free liquids and also because it fails to solidify the wastes in the basin.

The EPA has confirmed the plain language of the Rule. It has explained that a coal ash lagoon may not be closed by leaving coal ash submerged in groundwater. Instead, the operator

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<sup>22</sup> *Id.* § 257.102(d)(1)(i).

<sup>23</sup> *Id.* § 257.102(d)(1)(ii).

<sup>24</sup> *Id.* § 257.102(d)(2)(i).

<sup>25</sup> *Id.* § 257.102(d)(1)(i).

<sup>26</sup> *Id.* § 257.102(d)(1)(ii).

<sup>27</sup> *Id.* § 257.102(d)(2)(i).

<sup>28</sup> *Id.* § 257.53.

of the unit must comply with the Rule by “‘clean closing’ the submerged portion” of the impoundment.<sup>29</sup>

## **II. Colbert Ash Ponds**

Colbert began producing electricity from combustion of coal, gas and oil in 1955. At its peak, the facility had five coal-fired generating units with a total capacity of 1,300 megawatts, which consumed approximately 8,900 tons of coal per day. TVA idled Unit 5, its largest unit, in 2013 and retired the remaining units in late March 2016. Because it was operated after October 19, 2015, it is an “active electric utility” under the Coal Ash Rule.<sup>30</sup>

There are three ash ponds at the site: Ash Pond 1, Ash Pond 4 and Ash Pond 5. None of the ponds has a liner that meets the Coal Ash Rule requirements, and as a result, there is no barrier that prevents contaminants from leaking into groundwater and to surface water from the ash ponds. In addition, Colbert is situated on karst topography and terrain that is typically associated with sinkholes, underground caverns, caves, and harboring significant sources of groundwater with hydrologic connections to surface water.<sup>31</sup> “The discharge of groundwater into the river likely occurs at a series of submerged springs in the riverbed . . . there are numerous small springs emanating from many karst conduits . . . .”<sup>32</sup> Over the years, there have been at least two sinkhole collapses which contaminated surrounding surface and groundwater. One occurred in Ash Pond 5, and another occurred in an inactive chemical pond near Ash Pond 4.<sup>33</sup>

### **A. Ash Pond 1**

Located within feet of the Tennessee River, Ash Pond 1 was the first ash pond constructed at Colbert. It is approximately 40 acres in size and the amount of coal ash in the impoundment is unknown. Ash has not been sluiced to the pond since 1975; however, TVA periodically dry-stacked ash in this area between 1982 and 1990.<sup>34</sup> A reclamation and final grading plan was developed in 1976, but it appears that TVA has never covered the ash pond with an impermeable cap. Upon information and belief, groundwater continues to saturate the ash at Ash Pond 1. In a 1936 topographic map, prior to the damming of the Tennessee River that created Pickwick Lake, the ground surface elevation of the area where Ash Pond 1 is now located was less than 414 feet mean sea level (MSL).<sup>35</sup> TVA likely began sluicing ash onto the original ground surface, or perhaps even lower than the ground surface if it used the soil and rock from inside the impoundment to build the dikes around the ash pond. Currently, the groundwater

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<sup>29</sup> Att. 1, *What are options and the performance standards for closure of units under the CCR Rule?*, U.S. Environmental Protection Agency, <https://www.epa.gov/coalash/relationship-between-resource-conservation-and-recovery-acts-coal-combustion-residuals-rule#relation> (last visited June 27, 2017).

<sup>30</sup> 40 C.F.R. § 257.53.

<sup>31</sup> Att. 2, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, §§ 2.3, 2.4 (Apr. 2016).

<sup>32</sup> Att. 3, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, at 13 (Oct. 2016).

<sup>33</sup> Att. 4, Stantec Consulting Servs., Inc., Report of Phase 1 Facility Assessment, Coal Combustion Product Impoundments & Disposal Facilities, at Facility Summary, Colbert Fossil Plant, Closed Disposal Area 1 (June 2009) [hereinafter 2009 Stantec Assessment Report]; *see id.* at Disposal Area 5 Dry Stack.

<sup>34</sup> *Id.* at Closed Disposal Area 1.

<sup>35</sup> *See* Att. 5, Topographic Map, U.S. Geological Survey (1936).

in the bedrock is as high as 425 feet at Ash Pond 1.<sup>36</sup> Therefore, it is likely that over 10 feet of coal ash is submerged in groundwater at Ash Pond 1. There are two monitoring wells near Ash Pond 1. Well CA27BR is an upgradient well, and CA28B was drilled through the ash of Ash Pond 1. In April and October 2016, CA28B exceeded limits for ammonia, iron and manganese, all of which are indicative of coal ash contamination.<sup>37</sup>

TVA abandoned Ash Pond 1 without taking any steps to ensure that it would no longer contaminate ground and surface waters.<sup>38</sup> TVA has not lined the pond in accordance with the Coal Ash Rule, nor has it closed the pond with an impermeable cap. It has also not identified Ash Pond 1 as subject to the Coal Ash Rule and has not posted any information about the pond to its CCR website.

## **B. Ash Pond 4**

Ash Pond 4 is bordered by Cane Creek to the east, U.S. Highway 72 to the south, and a former metal-cleaning pond just to the west. It was first constructed in 1972 and contains approximately 3.2 million cubic yards of coal ash.<sup>39</sup> Until TVA retired Colbert, Ash Pond 4 received approximately 30,000 tons per year of wet bottom ash. In 1984, the dikes were raised 20 feet using highly permeable sluiced ash as a construction material. This faulty construction method resulted in a “seepage zone”<sup>40</sup> through which Ash Pond 4 has leaked wastewater at its mid-slope, including from sections bordering Cane Creek.

At Ash Pond 4, coal ash saturates the groundwater. At Ash Pond 4, TVA admitted that the ash is submerged in an average of seven feet of groundwater.<sup>41</sup> A review of TVA’s own documents shows that even more ash—more than 20 feet—is submerged in groundwater. The bottom elevation of the pond is approximately 420 feet MSL,<sup>42</sup> and groundwater elevations in and around the pond are generally around 445 feet MSL.<sup>43</sup>

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<sup>36</sup> Att. 6, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, Fig. 2 (Oct. 2013).

<sup>37</sup> Att. 2, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, at 19 (Apr. 2016); Att. 3, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, at 25 (Oct. 2016). TVA tests for 13 pollutants when it conducts groundwater monitoring. Five of those tested are listed on Appendix III and IV of the CCR Rule. See 40 C.F.R. Pt. 257, App. III, IV.

<sup>38</sup> See, e.g., 2009 Stantec Assessment Report, *supra* note 33, at Closed Disposal Area 1, p. 5 (stating that the northwest weir inlet and two pipe outlets were found but “no apparent abandoned/closure effort was observed”).

<sup>39</sup> Tenn. Valley Auth., Final Env’tl. Impact Statement, Closure of Coal Combustion Residual Impoundments, Part II – Site-Specific NEPA Review: Colbert Fossil Plant at 4 (June 2016), [https://www.tva.gov/file\\_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/Environmental%20Reviews/Closure%20of%20Coal%20Combustion%20Residual%20Impoundments/Final%20EIS%20Part%20II-Colbert%20Fossil%20Plant.pdf](https://www.tva.gov/file_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/Environmental%20Reviews/Closure%20of%20Coal%20Combustion%20Residual%20Impoundments/Final%20EIS%20Part%20II-Colbert%20Fossil%20Plant.pdf).

<sup>40</sup> 2009 Stantec Assessment Report, *supra* note 33, at Ash Pond 4, p. 5.

<sup>41</sup> Tenn. Valley Auth., Final Env’tl. Impact Statement, *supra* note 39, at App. A, Response to Comments at 28-30, [https://www.tva.gov/file\\_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/Environmental%20Reviews/Closure%20of%20Coal%20Combustion%20Residual%20Impoundments/Final%20EIS%20Part%20I.pdf](https://www.tva.gov/file_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/Environmental%20Reviews/Closure%20of%20Coal%20Combustion%20Residual%20Impoundments/Final%20EIS%20Part%20I.pdf).

<sup>42</sup> Att. 7, Stantec Consulting Servs., Inc., Report of Geotechnical Exploration and Slope Stability Evaluation, Ash Pond 4, Colbert Fossil Plant, § 3.3.2 (Jan. 22, 2010).

<sup>43</sup> Attachment 8, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, at Fig. 5 (Oct. 2014).

TVA's groundwater monitoring reports show contamination in wells downgradient of Ash Pond 4. The most recent groundwater monitoring data, from October 2016, showed that well CA17B, on northeast side of Ash Pond 4, exceeded the EPA Regional Screening Levels for tap water for lithium, manganese and sulfate, and well CA30B, east of the pond, exceeded manganese levels.<sup>44</sup> In April 2016, groundwater monitoring reports show contaminants at levels above the ADEM Water Quality Goals (which was the standard TVA used prior to the October 2016 report). For Ash Pond 4, Well CA17B exceeded the iron, manganese and sulfate WQGs, CA30B exceeded the manganese WQG and CA31A, north of the pond, exceeded the vanadium WQG.<sup>45</sup> These pollutants indicate that coal ash has contaminated the groundwater.

According to the closure plan posted on its CCR website, TVA has chosen to close Ash Pond 4 by capping the ash in place.<sup>46</sup> Decanting has already begun and closure will be completed within the year.<sup>47</sup>

### C. Ash Pond 5

Ash Pond 5 is located across Cane Creek to the east, close the Ash Pond 4. It is bordered by the Tennessee River to the north and Cane Creek to the west. Ash Pond 5 includes the stilling pond, the ash pond area to the west of the ash stack, and the ash stack.<sup>48</sup> TVA initially used Ash Pond 5 as a wet ash impoundment, but a sinkhole developed, causing the release of contaminants to groundwater.<sup>49</sup> As a result of the sinkhole development, ADEM required TVA to institute a groundwater monitoring program. TVA capped the sinkhole area but did not cease using Ash Pond 5 for coal ash disposal. Until 1990, TVA used portions of Ash Pond 5 to dispose of ash material dredged from Ash Pond 4. TVA then converted part of Ash Pond 5 to dry stacking. Until TVA closed Colbert, it was using the area to dispose of approximately 350,000 tons per year of dry fly ash.

Like Ash Ponds 1 and 4, the coal ash in the Ash Pond 5 is saturated with groundwater. In the dry stack area, the bottom of the ash pond and the beginning of the sluiced ash is between 450 feet and 460 feet MSL.<sup>50</sup> According to TVA's consultant Stantec, groundwater levels

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<sup>44</sup> Att. 3, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, at 25 (Oct. 2016).

<sup>45</sup> Att. 2, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, at 19–20 (Apr. 2016).

<sup>46</sup> AECOM, Tenn. Valley Auth. Colbert Fossil Plant Closure (40 CFR 257.102(b)(1)) and Post-Closure Plan (40 CFR 257.104(d)(1)) for Coal Combustion Residuals, at 2 (Oct. 10, 2016), [https://ccr.tva.gov/Plants/COF/Surface%20Impoundment%20-%20Ash%20Disposal%20Area%204/Closure%20-%20Post-Closure%20Plan/Closure%20Plan/257-102\(b\)\\_Written%20Closure%20Plan\\_COF\\_Ash%20Disposal%20Area%204.pdf](https://ccr.tva.gov/Plants/COF/Surface%20Impoundment%20-%20Ash%20Disposal%20Area%204/Closure%20-%20Post-Closure%20Plan/Closure%20Plan/257-102(b)_Written%20Closure%20Plan_COF_Ash%20Disposal%20Area%204.pdf).

<sup>47</sup> *Id.*

<sup>48</sup> TVA maps show that Ash Pond 5 includes more than just the dry stack that TVA has capped. *See, e.g.*, Att. 3, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, at Site Location Map, Fig. 1 (Oct. 2016); Att. 8, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, at Fig. 5 (Oct. 2014).

<sup>49</sup> *See* Att. 9, Complaint at ¶ 4, *Ala. Dep't of Env'tl. Mgmt. v. Tenn. Valley Auth.*, No. 20-cv-2013-900213 (Cir. Ct. Colbert Cty. Apr. 12, 2013).

<sup>50</sup> Att. 10, AECOM, Tenn. Valley Auth. Colbert Fossil Plant Ash Stack 5 Final Closure QA/QC Plan, at Figs. A.2–A.6 (July 2016) [hereinafter Ash Stack 5 Closure Plan].

extend to 504 feet MSL.<sup>51</sup> Therefore, groundwater is in contact with over 50 feet ash at Ash Pond 5.

Groundwater monitoring reports show that the groundwater around Ash Pond 5 is contaminated. The October 2016 report shows contaminants at levels exceeding EPA Regional Screening Levels for tap water. Wells CA16 and CA21B, both south of Ash Pond 5, exceeded the Regional Screening Levels for tap water for boron and lithium.<sup>52</sup> Well CA19B, north of the pond, exceeded the Regional Screening Level for boron and manganese and well CA20A, east of the pond, had an exceedance for boron.<sup>53</sup> In April 2016, groundwater monitoring tests showed contaminants at levels above the ADEM Water Quality Goals.<sup>54</sup> Well CA21B exceeded the WQG for aluminum, iron, manganese and vanadium, well CA20A exceeded the WQG for iron and vanadium, and well CA22B, north of the pond, exceeded the WQG for vanadium.<sup>55</sup> Once again, these constituents are present in coal ash and indicate coal ash contamination.

Ash Pond 5 stopped receiving fly ash on October 17, 2015. TVA chose to cover the ash stack portion of Ash Pond 5 by capping the ash in place and finished the process in fall 2016.<sup>56</sup> TVA did not dewater the ash stack prior to covering it. TVA has not closed any other portion of Ash Pond 5. Furthermore, TVA has not placed any information about Ash Pond 5 in its operating record or on its CCR website.

### **III. TVA's Violations of the Coal Ash Rule**

#### **A. TVA failed to identify Ash Pond 1 and Ash Pond 5 as inactive surface impoundments and failed to comply with the Rule's requirements for the impoundments.**

Under the Coal Ash Rule's definition, Ash Ponds 1 and 5 are inactive CCR surface impoundments; however, TVA has failed to identify either as coal ash units subject to the Coal Ash Rule. Both were designed and used as coal ash surface impoundments and TVA has not removed the ash from either impoundment. They both continue to impound liquids. At Ash Pond 1, more than 10 feet of ash is saturated with groundwater. At Ash Pond 5, ash is submerged in over 50 feet of groundwater, according to TVA's own consultant's reports. Because it meets the definition of inactive surface impoundment, TVA must comply with the Coal Ash Rule requirements for Ash Ponds 1 and 5.

Because TVA failed to identify Ash Ponds 1 and 5 as inactive surface impoundments, it has not, to our knowledge, compiled the required information in a written operating record, nor

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<sup>51</sup> *Id.* at Fig. A.2; Att. 11, Stantec Consulting Servs., Inc., Report of Geotechnical Exploration and Slope Stability Evaluation, Disposal Area 5 Dry Stack and Drainage Basin, Colbert Fossil Plant, at Geotechnical Exploration Stability Section B, PDF p. 294 (Mar. 26, 2010).

<sup>52</sup> Att. 3, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report, at 25–26 (Oct. 2016).

<sup>53</sup> *Id.*

<sup>54</sup> Att. 2, Tenn. Valley Auth., Colbert Fossil Plant, Groundwater Monitoring Report (Apr. 2016).

<sup>55</sup> *Id.* at 20.

<sup>56</sup> Press Release, Tenn. Valley Auth., Colbert Ash Stack Closure Complete, <https://www.tva.gov/Newsroom/Colbert-Ash-Stack-Closure-Complete>.

has it posted any documents pertaining to the ash ponds to its CCR website.<sup>57</sup> With respect to Ash Ponds 1 and 5, TVA must comply with the deadlines and requirements that apply to both inactive and existing surface impoundments. TVA must post the required documents immediately to comply with the Rule.

**B. TVA failed to post required documents for Ash Pond 4 on its CCR website.**

TVA failed to post any of the design and operating criteria documents by the required deadline for Ash Pond 4. It was not until weeks later, after discussion with SELC in late November 2016, that TVA posted some of the required documents for Ash Pond 4 in December 2016. To date, TVA has not posted its initial factor of safety assessment for Colbert Ash Pond 4 as required by 40 C.F.R. § 257.73(e); instead, TVA has posted a document for the assessment stating “Non-active – Pending Closure.”<sup>58</sup> Because it failed to post the required factor of safety assessment, TVA is violating the Rule.

Section 257.73 applies to all CCR surface impoundments and TVA has identified Ash Pond 4 as a surface impoundment subject to the Coal Ash Rule. TVA has announced its intent to close Ash Pond 4, but that decision does not exempt the pond from requirements that apply to all surface impoundments. While the Rule requires a facility to close if it does not complete the factor of safety assessment,<sup>59</sup> the fact that a facility has *chosen* to close does not exempt it from complying with the Rule and completing the initial assessment. The result of the factor of safety assessments is relevant to the assessment of stability risks at Ash Pond 4, which should inform TVA’s decision whether to close the impoundment by leaving the ash in place or by removing the ash. We are aware of at least one utility (Duke Energy for its Weatherspoon plant in North Carolina) which has identified seismic risk as the reason for selecting closure by removal.<sup>60</sup> Furthermore, the public has a right to know whether the dikes at Colbert meet the factor of safety requirements in the Rule. Because of known stability issues at Ash Pond 4, TVA’s failure to post the factor of safety assessments may put the public at risk and could be interpreted as an attempt to conceal the severity of the dikes’ instability from the public.

After the 2008 Kingston coal ash spill, the EPA commenced an assessment program to determine whether CCR units were structurally stable. In 2014, TVA sent a letter to EPA stating that its embankment liquefaction potential analysis for Ash Pond 4 “yielded factors of safety that did not meet the minimum criteria used during EPA’s assessment effort (i.e., a factor of safety of 1.0 or greater for post-liquefaction slope stability).”<sup>61</sup> TVA informed EPA that it would

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<sup>57</sup> *Colbert Coal Combustion Residuals*, Tenn. Valley Auth., <https://www.tva.gov/Environment/Environmental-Stewardship/Coal-Combustion-Residuals/Colbert> (last visited Apr. 27, 2017) (identifying only Ash Pond 4).

<sup>58</sup> *Colbert Coal Combustion Residuals*, Tenn. Valley Auth., [https://ccr.tva.gov/Plants/COF/Surface%20Impoundment%20-%20Ash%20Disposal%20Area%204/Design%20Criteria/Safety%20Factor/257-73\(e\)\\_Safety%20Factor\\_COF\\_Ash%20Disposal%20Area%204.pdf](https://ccr.tva.gov/Plants/COF/Surface%20Impoundment%20-%20Ash%20Disposal%20Area%204/Design%20Criteria/Safety%20Factor/257-73(e)_Safety%20Factor_COF_Ash%20Disposal%20Area%204.pdf) (last visited June 27, 2017).

<sup>59</sup> 40 C.F.R. § 257.73(f)(4).

<sup>60</sup> Letter to Weatherspoon Plant Neighbors from David McNeill, Duke Energy (June 2015), [https://www.duke-energy.com/\\_/media/pdfs/our-company/ash-management/safebasinclosureupdateneighborletterweatherspoonweb.pdf?la=en](https://www.duke-energy.com/_/media/pdfs/our-company/ash-management/safebasinclosureupdateneighborletterweatherspoonweb.pdf?la=en).

<sup>61</sup> Att. 12, Letter from Barnes Johnson, Director, Office of Resource Conservation and Recovery, EPA, to Brenda Brickhouse, Vice President for Environmental Permits and Compliance, TVA (Dec. 16, 2015).

implement soil improvement actions to address the liquefaction issue.<sup>62</sup> EPA responded that “[u]ntil determined otherwise, the underlying potential for liquefaction-induced failure of [Ash Pond 4] remain[s] a concern that should be addressed by taking necessary actions to ensure that [Ash Pond 4] will be structurally sound.”<sup>63</sup> EPA requested that TVA give “particular attention” to Ash Pond 4 and work with ADEM to ensure that the pond is structurally stable.<sup>64</sup> TVA conducted a seismic improvement project, and has stated that it “considers the 2015 soil improvement project and closure of Pond 4 to be sufficient to address any liquefaction potential at Pond 4.”<sup>65</sup> It is unknown whether EPA and ADEM agree with TVA’s assessment that the project and closure adequately address the structural stability issues. Without posting the required analysis, it is impossible for citizens to know whether the site currently meets the factors of safety.

To comply with the Rule’s requirements, ensure the public that the dike meets the minimum factors of safety and ensure that its closure plan will comply with the Rule, TVA must conduct an initial factor of safety assessment and post the results to its CCR website.

**C. TVA’s abandonment of Ash Pond 1, closure of Ash Pond 5 and closure plan for Ash Pond 4 do not satisfy the minimum performance standards required by the Rule.**

TVA’s abandonment of Ash Pond 1, closure of Ash Pond 5 and closure plan for Ash Pond 4 violate §§ 257.102(b) and (d) of the Coal Ash Rule because they fail to meet the minimum requirements for closure under the Rule and leave coal ash submerged in the groundwater in perpetuity. First, TVA’s actions at Ash Pond 1 and Ash Pond 5 do not, and its plan for Ash Pond 4 will not, “control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate or contaminated run-off to the ground or surface waters.” As TVA’s monitoring reports and Stantec geotechnical reports show, the coal ash in all three impoundments is saturated with groundwater. When TVA abandoned Ash Ponds 1 and 5, it made no attempt to “control, minimize or eliminate” the infiltration of groundwater or precipitation into Ash Ponds 1 and 5, nor did it make any attempt to control the release of CCR and coal ash contaminants into ground or surface waters. TVA’s cap on the dry stack portion for Ash Pond 5 may reduce infiltration from new precipitation, but will not prevent groundwater from flowing through the ash. The groundwater contamination around Ash Ponds 1 and 5 indicate the release of CCR. Similarly, in its closure plan for Ash Pond 4, TVA proposes a cap that will reduce the infiltration from new precipitation, but it will not prevent the lateral inflow of groundwater from flowing into and out of the coal ash buried beneath the cap. The closure plan fails to mention that the coal ash is currently submerged in groundwater and that groundwater surrounding the pond is contaminated with coal ash indicator pollutants.

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<sup>62</sup> Att. 13, Letter from Wilbourne C. Markham, Jr., Director, Environmental Permits & Compliance, TVA, to Betsy Devlin, Director, EPA, at 1 (May 1, 2015).

<sup>63</sup> Letter from Barnes Johnson, *supra* note 61.

<sup>64</sup> *Id.*

<sup>65</sup> Att. 14, Letter from John J. McCormick, Jr., Vice President of Safety, River Management, and Environment, TVA, to Betsy Devlin, Director, EPA, at 1 (Dec. 21, 2016).

Second, TVA's actions and proposed actions will not "preclude the probability of future impoundment of water, sediment or slurry" because the ash at all three ponds is currently submerged in groundwater. At Ash Ponds 1 and 5, TVA left the ash in the ponds without constructing any cap or cover, or making any other attempt to prevent future impoundment. The dry stack in Ash Pond 5 was capped without removing the impounded groundwater or preventing additional groundwater from flowing through it. Similarly, although TVA knows that the ash is submerged in groundwater at Ash Pond 4, its closure plan fails to mention the submergence of ash and also fails to explain how its cap in place system will prevent the future impoundment of groundwater within the pond.

Finally, TVA is violating the performance standards in § 257.102(d) by failing to "eliminate[]" "free liquids . . . by removing liquid wastes or solidifying the remaining wastes." TVA made no attempt to dewater Ash Ponds 1 and 5 prior to abandoning them, and also made no attempt to dewater the dry stack before capping it. Both ponds, as well as the dry stack, currently hold liquids and groundwater will continue to flow through them. For Ash Pond 4, TVA does not intend to "eliminate[]" "free liquids" prior to capping in place. The closure plan states that TVA will remove "free water," but does not state that it will remove pore water that is standing in the waste.<sup>66</sup> Furthermore, the closure plan does not address how TVA will satisfy the performance standards in 40 C.F.R. § 257.102(d) given the fact that the ash is submerged in groundwater. In fact, the closure plan cannot meet the performance standards in light of these conditions, and it makes no attempt to do so.

Because the ash is sitting in groundwater, TVA must excavate and remove the ash located in Ash Pond 1, Ash Pond 4 and Ash Pond 5. Clean closure, or closure by removing the ash, is necessary where ash is submerged in groundwater.<sup>67</sup>

TVA must comply with the Coal Ash Rule by identifying and placing required information in the operating record and on the CCR website, and by ensuring that the ash ponds will meet the performance standards in the Rule given the existing conditions at the Colbert site. Currently, ash in all three ponds is in direct contact with groundwater at the site, and contamination of ground and surface waters will continue until TVA removes the ash from the impoundments.

We welcome the opportunity to discuss these concerns with you.

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<sup>66</sup> Att. 15, AECOM, Tenn. Valley Auth., Colbert Fossil Plant Ash Pond 4 Final Closure QA/QC Plan, at PDF p. 63 (Closure/Post-Closure Plan at 7) (July 2016). Note that this closure plan submitted to ADEM is not the same closure plan posted for CCR compliance, and contains more detail than the one on TVA's website.

<sup>67</sup> See *Closure Requirements*, U.S. Env'tl. Protection Agency, <https://www.epa.gov/coalash/relationship-between-resource-conservation-and-recovery-acts-coal-combustion-residuals-rule#Closure> (last visited June 27, 2017) (explaining that where small corner of unit is submerged in underlying aquifer, facility should clean close the submerged portion of the unit).

Sincerely,



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