



July 15, 2016

Revised signatories July 18, 2016

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SUBMITTED VIA WEBSITE

**Re: Comments on the Shawnee Fossil Plant Bottom Ash Process Dewatering Facility Draft Environmental Assessment**

Thank you for the opportunity to provide the following comments on the draft environmental assessment (“Draft EA”) TVA is undertaking pursuant to the National Environmental Policy Act (“NEPA”) regarding the proposed construction of a bottom ash process dewatering facility at the Shawnee Fossil Plant located in West Paducah, Kentucky. On behalf of Sierra Club and the Southern Alliance for Clean Energy (SACE), we submit these comments identifying the failure to consider a reasonable range of alternatives as a deficiency in the Draft EA. In particular, TVA should have considered retirement of the Shawnee facility as a practicable alternative that would have far lesser environmental impact than TVA’s preferred alternative, and would also avoid yet another costly expenditure on an old, marginal coal plant that is not needed to meet TVA’s demand.

Proceeding with TVA’s preferred alternative would commit TVA to continued operation of the Shawnee plant, at a cost of tens of millions of dollars to TVA’s customers, as well as a significant impact on the environment and health of Kentuckians. The Draft EA must be revised to consider retiring the Shawnee plant as an alternative that would accomplish TVA’s goal while avoiding these costs.

**I. The Draft EA Fails to Consider a Reasonable Range of Alternatives**

***A. Alternatives Analysis Required Under NEPA***

NEPA requires federal agencies to “study, develop, and describe appropriate alternatives to recommended courses of action.”<sup>1</sup> The alternatives analysis required by NEPA is the “heart” of the environmental review.<sup>2</sup> An agency must give alternatives “full and meaningful consideration, whether the agency prepares an EA or an EIS.”<sup>3</sup> Further, guidance from the Council on Environmental Quality (CEQ) states that agencies must evaluate “a reasonable number of examples covering the full spectrum of alternatives.”<sup>4</sup> CEQ further states that: “Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.”<sup>5</sup>

An EA must include a discussion of alternatives and “the environmental impacts of the proposed action and alternatives.”<sup>6</sup> Alternatives analysis under an EA need not be as rigorous as under an EIS, but an agency must nonetheless “give full and meaningful consideration to all reasonable alternatives.”<sup>7</sup> Here, in lieu of a proper alternatives analysis, the Draft EA considers only two alternatives: the requisite No Action Alternative (Alternative A) and a single action Alternative (Alternative B). The failure to discuss other reasonable alternatives violates NEPA. The Sixth Circuit has stated that “[NEPA] prevents federal agencies from effectively reducing the discussion of environmentally sound alternatives to a binary choice between granting or denying an application.”<sup>8</sup>

The purpose of the NEPA process is “to provide full and fair discussion of significant environmental impacts and to inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.”<sup>9</sup> As such, the core duty under NEPA is for an agency to “[r]igorously explore and

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<sup>1</sup> 42 U.S.C. § 4332(2)(E).

<sup>2</sup> See 40 C.F.R. § 1502.14.

<sup>3</sup> *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (internal quotation marks and citations omitted).

<sup>4</sup> *Forty Most Frequently Asked Questions Concerning CEQ’s NEPA Regulations*, 46 Fed. Reg. at 18,027.

<sup>5</sup> CEQ, *A Citizen’s Guide to NEPA* at 16 (Dec. 2007).

<sup>6</sup> 40 C.F.R. § 1508.9(b).

<sup>7</sup> *Western Watersheds Project v. Abbey*, 719 F.3d 1035, 1050 (9th Cir. 2013).

<sup>8</sup> *Save Our Cumberland Mountains v. Kempthorne*, 453 F.3d 334, 344 (6th Cir. 2006); see also *Davis v. Mineta*, 302 F.3d 1104, 1122 (10th Cir. 2002) (“[O]nly two alternatives were studied in detail: the no build alternative, and the preferred alternative. [The agency] acted arbitrarily and capriciously in approving an [environmental assessment] that does not provide an adequate discussion of [p]roject alternatives.”)

<sup>9</sup> *Natural Res. Def. Council, Inc. v. Fed. Aviation Admin.*, 564 F.3d 549, 556 (2d Cir. 2009) (internal quotation marks and alteration omitted)

objectively evaluate all reasonable alternatives” to a proposed action.<sup>10</sup> This required alternatives analysis “should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among the options by the decisionmaker and the public.”<sup>11</sup> Such analysis constitutes the “heart” or “linchpin” of the NEPA analysis,<sup>12</sup> and helps to:

ensure[s] that each agency decision maker has before him and takes into proper account all possible approaches to a particular project (including total abandonment of the project) which would alter the environmental impact and the cost-benefit analysis. Only in that fashion is it likely that the most intelligent, optimally beneficial decision will ultimately be made.<sup>13</sup>

Courts have recognized that “[n]o decision is more important than delimiting what these ‘reasonable alternatives’ are,”<sup>14</sup> and have made clear that a wide net should be cast in identifying and exploring such alternatives. For example, the alternatives analysis must include a consideration not only of individual actions, but also of a combination of actions that could satisfy the purpose and need of the project.<sup>15</sup> In addition, “reasonable alternatives” should include feasible options even if they are “not within the jurisdiction of the lead agency.”<sup>16</sup> And in order to ensure that the alternatives analysis is not hampered by a rigid concept of what is needed at the outset of the NEPA process, agencies must consider alternatives that meet only part of the stated purpose of the proposed action.<sup>17</sup> When an agency suggests that an otherwise achievable alternative is not “feasible” or “prudent,” the agency must back up that assertion with specifics such as “cost studies, cost/benefit analyses, or other barriers that warrant a conclusion that [the proposed] alternatives are unreasonable, standing alone or in conjunction with other

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<sup>10</sup> 42 U.S.C. § 4332(2)(C); 40 C.F.R. § 1502.14(a).

<sup>11</sup> 40 C.F.R. § 1502.14.

<sup>12</sup> 40 C.F.R. § 1502.14; *Monroe Cty. Conservation Council*, 472 F.2d 693, 697-98 (2d. Cir. 1972).

<sup>13</sup> *Calvert Cliffs’ Coordinating Comm., Inc. v. Atomic Energy Comm’n*, 449 F.2d 1109, 1114 (D.C. Cir. 1971).

<sup>14</sup> *Simmons v. U.S. Army Corps of Engineers*, 120 F.3d 664, 666 (7<sup>th</sup> Cir. 1997).

<sup>15</sup> *Davis v. Mineta*, 302 F.3d 1104, 1121-22 (10<sup>th</sup> Cir. 2002) (finding that agency’s failure to evaluate a combination of alternatives “represents one of the most egregious shortfalls in the EA”)

<sup>16</sup> 40 C.F.R. § 1502.14(c); *see also* 46 Fed. Reg. 18,026, 18,027 (March 23, 1981) (“An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable.”).

<sup>17</sup> *North Buckhead Civic Ass’n v. Skinner*, 903 F.2d 1533, 1542 (11<sup>th</sup> Cir. 1990) (“A discussion of alternatives that would only partly meet the goals of the project may allow the decision maker to conclude that meeting part of the goal with less environmental impact may be worth the tradeoff with a preferred alternative that has greater environmental impact.”); *Natural Resources Defense Council v. Morton*, 458 F.2d 827, 836 (D.C. Cir. 1972) (“[It is not] appropriate . . . to disregard alternatives merely because they do not offer a complete solution to the problem.”).

alternatives.”<sup>18</sup>

**B. TVA Failed to Include Reasonable Alternatives to its Proposed Action**

The stated purpose of the proposed action in the Draft EA is “to help TVA meet its commitment to convert CCR storage from wet to dry, complement compliance with the CCR rule and enhance compliance with the ELG rule.” Draft EA at 1. TVA notes this action is part of a larger response to the TVA Board’s call to address all wet coal ash impoundments at TVA facilities. *Id.*

To achieve this goal, TVA considered three alternative actions: a no action alternative (Alternative A); construction of a process dewatering facility that uses a “once through” system (Alternative B); and construction of a dewatering facility with a recirculating or “closed loop” system (Alternative C). Draft EA at 7. TVA selects the dewatering facility with the closed loop system as its preferred alternative. *Id.* at 18. TVA states that it prefers this alternative because it would “facilitate[] TVA’s future compliance with the ELG through the reduction of discharge from the KPDES permitted outfalls.” *Id.*

TVA is correct to conclude that Alternative C better achieves the stated purpose of “enhancing compliance with the ELG rule” than does Alternative B; the closed loop system would eliminate the discharge of bottom ash sluice water to Outfall 001, while a once-through system would only reduce the volume of that discharge by approximately half. Given that the ELG rule requires elimination of bottom ash sluice water discharges, Alternative C better meets the stated purpose and need of the proposed project. Alternative B should be rejected as an option that does not meet the stated purpose and need.

But TVA fails to consider a third approach that would achieve the stated purpose: cease burning coal at the Shawnee Fossil Plant. This alternative would allow TVA to comply with the ELG rule and assist with CCR rule compliance by eliminating the generation of coal ash altogether, while avoiding the need to construct a dewatering facility, and would also provide a host of other environmental benefits that Alternative C does not.

This alternative is practicable because, as TVA itself has repeatedly admitted, the Shawnee Fossil Plant is not needed to meet TVA’s electricity demand. For instance, in its December 2014 Final EA for proposed retrofits to Shawnee units 1 and 4, TVA acknowledged

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<sup>18</sup> *Davis*, 302 F.3d at 1122.

that the units “are not needed for reliability purposes in the Paducah area,” and could be retired “without having to build or obtain replacement capacity to maintain reliable service in the Paducah area.”<sup>19</sup> TVA nonetheless vaguely asserted that the units “help meet the growing demand for energy and capacity on the TVA system....” *Id.* In that Final EA, TVA cited to its 2011 Integrated Resource Plan to substantiate its claim that “demand forecasts indicate...a general need for more generation on the TVA system in the future.” *Id.* at 2-8.

But TVA’s 2011 demand forecast has since proven to have been significantly overstated, as TVA itself has admitted. For example, the 2011 IRP projected a total energy demand of approximately 180,000 MWhs in 2013 and more than 190,000 MWhs by 2020.<sup>20</sup> In reality, TVA reported an expected fiscal year 2013 energy demand of around 165,000 MWh.<sup>21</sup> At the same time, TVA stated that demand was projected to remain below 180,000 MWhs through at least fiscal year 2024.<sup>22</sup> Similarly, the 2011 IRP projected peak energy demand of approximately 32,500 MW in 2013 increasing to nearly 40,000 MW by 2024.<sup>23</sup> But at a 2014 board meeting, TVA reported that peak demand was expected to be around 30,000 MW in fiscal year 2013 and to increase to 32,500 MW by fiscal year 2024. In August 2013, TVA announced that it was increasing customers’ rates to make up for declining energy sales.<sup>24</sup> These changed circumstances are precisely the reason that TVA expedited its next IRP planning process, which began in 2014. TVA’s 2015 IRP incorporated the same 1.1% load growth outlook discussed at the 2014 board meeting.<sup>25</sup>

Moreover, TVA lost its largest customer in 2013 when the Department of Energy’s USEC gaseous diffusion facility in Paducah, Kentucky closed its operations.<sup>26</sup> USEC’s closure

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<sup>19</sup> Shawnee Fossil Plant Units 1 and 4 Final Environmental Assessment, December 2014, at 1-3, available at [https://www.tva.gov/file\\_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/Environmental%20Reviews/Shawnee%20Fossil%20Plant%20Units%201%20and%204/Shawnee%20U1-4%20FEA.pdf](https://www.tva.gov/file_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/Environmental%20Reviews/Shawnee%20Fossil%20Plant%20Units%201%20and%204/Shawnee%20U1-4%20FEA.pdf)

<sup>20</sup> 2011 TVA Integrated Resource Plan at 69

<sup>21</sup> TVA Board Meeting – Fiscal Year 2014 Financial Plan – Finance, Rates, and Portfolio Committee (Aug. 22, 2013), at p. 46, available at [http://www.tva.gov/abouttva/board/pdf/aug-22-2013\\_public\\_board.pdf](http://www.tva.gov/abouttva/board/pdf/aug-22-2013_public_board.pdf) (hereinafter “TVA Board Meeting”).

<sup>22</sup> *Id.*

<sup>23</sup> 2011 TVA Integrated Resource Plan at 68.

<sup>24</sup> Dave Flessner, “TVA Rates Rise As Power Sales Decline in the Tennessee Valley,” *Chattanooga Times Free Press* (Aug. 23, 2013), available at <http://timesfreepress.com/news/2013/aug/23/tva-rates-rise-power-sales-decline/>.

<sup>25</sup> 2015 TVA IRP at 29, figure 4-3 Peak Demand Forecast, available at [https://www.tva.gov/file\\_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/IRP/Documents/2015\\_irp.pdf](https://www.tva.gov/file_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/IRP/Documents/2015_irp.pdf)

<sup>26</sup> Dave Flessner, “TVA Suffers Blow, Loses Biggest Customer,” *Chattanooga Times Free Press*, May 31, 2013, available at <http://www.timesfreepress.com/news/2013/may/31/tva-suffers-blow-loses-biggest-customer/>

resulted in a loss of 8,200 GWhs of energy demand per year and a 4.6% decline in projected energy sales in fiscal year 2014 compared to fiscal year 2013.<sup>27</sup> The Shawnee plant was originally built to serve USEC’s load and as such, would require significant transmission upgrades in order to wheel Shawnee’s output into TVA larger system, if local demand is not procured.

Recent statements by TVA indicate that its actual demand is even lower than was forecasted in the 2015 IRP. TVA’s demand in the first half of 2016 was up less than 0.2 percent in the past year, and TVA expects to see only 0.1 to 0.2 percent growth for the foreseeable future—in TVA’s words, “We’re seeing essentially flat growth.”<sup>28</sup> Sales also fell significantly from the prior year, from \$5.2 billion in 2015 to \$4.78 billion in 2016 over the same time period.<sup>29</sup>

Any decision to continue to make costly upgrades to the Shawnee plant based on “demand growth” is thus in direct contrast to TVA’s own IRP and recent demand data. TVA’s significant decline in local and peak system demand combined with an overall decrease in energy sales argues against the preferred alternative and suggests that TVA could retire the Shawnee plant without need for replacement generation. TVA thus must consider retirement of Shawnee as a viable alternative to installing additional retrofits at the plant.

Retrofitting the Shawnee plant is also unreasonable in light of its age. The Shawnee units all became operational between 1953 and 1955, making them each over sixty years old. This meets, if not exceeds, the average design life of a coal-fired power plant—and yet TVA now proposes to spend undisclosed millions to keep the units operating. It does not make economic sense to spend any dollars on units of this age, let alone a sum that could take many years to recover. Most coal-fired plants of early 1950s vintage have either already retired, announced retirement, or are projected to retire by 2025. As shown in the figure below, 76% of plants built between 1950 and 1954 (the same vintage as Shawnee) have already announced retirement. Moreover, in its modeling underlying the Clean Power Plan, EPA has projected that all of the capacity from this era will be retired by 2025 in model runs. The table below depicts, by vintage,

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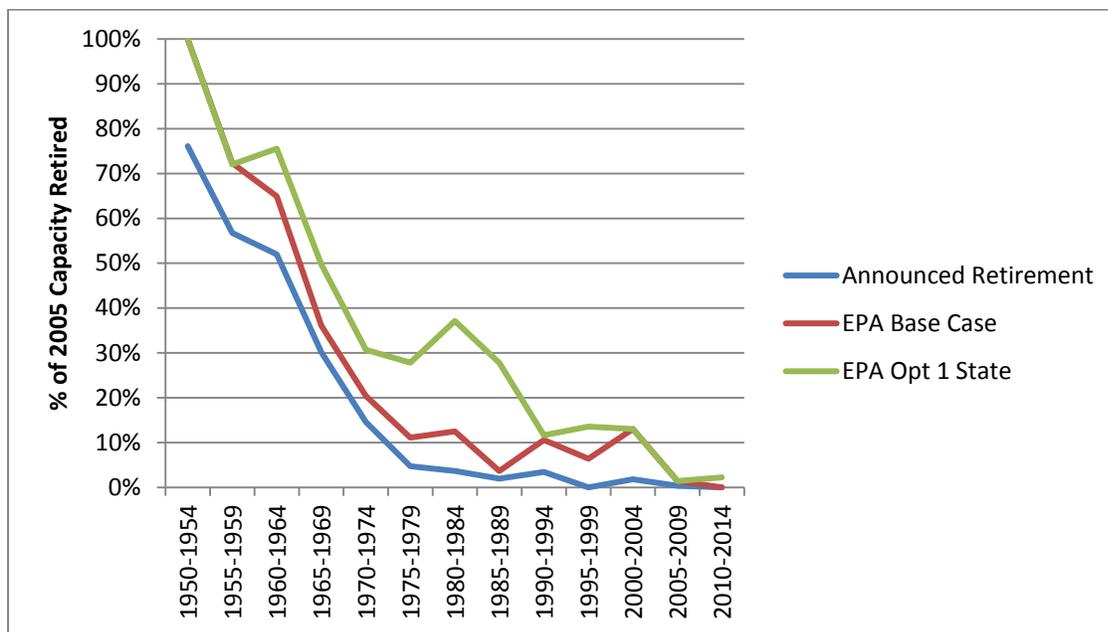
<sup>27</sup> TVA Board Meeting at p. 50.

<sup>28</sup> Dave Flessner, “TVA faces new era of stagnant power demand,” *Chattanooga Times Free Press*, May 4, 2016, available at <http://www.timesfreepress.com/news/business/aroundregion/story/2016/may/04/tvfaces-new-erstagnant-power-demand/363676/>

<sup>29</sup> *Id.*

the amount of capacity that was operational in 2005, as well as the percentage of that capacity expected to be retired by 2025 according to different forecasts.<sup>30</sup>

Figure 1: Operational Coal-Fired Units (by Age)



In order to recover the millions of dollars it would cost to construct the dewatering facility, TVA would likely have to maintain them well beyond their expected life. Older plants are susceptible to catastrophic events, and TVA must account for the strong risk that the units become inoperable before the costs of the scrubbers fully recovered.

<sup>30</sup> 2005 online coal capacity was calculated by adding “Operable” plants found in the EIA’s 2012 Form-860, along with the EIA list of 2005-2012 “Retired” units. For the years 2006-2012 retirements, we used EIA-860 data; for 2013-2015, we used Sourcewatch data on announced retirements; and for 2016 and following, we used EPA projections and announced retirements.

- Retired Units (2006-2015) and Announced Retirements (2016-2025)
- Retired Units (2006-2015) and EPA CPP Base-Case Model Run (2016-2025)
- Retired Units (2006-2015) and EPA CPP Option 1, State Compliance Model Run (2016-2025)

The CPP Base Case is the EPA’s best estimate of what will happen between now and 2025 given no change in rules. Retirements are for economic reasons rather than new environmental regulation. The Option 1 State Level Compliance run projects retirements given stringent new carbon regulation; this is the model run that sees the largest amount of capacity retired.

***C. The Retirement Alternative Would Significantly Reduce Environmental Impacts.***

1. Retirement would substantially reduce greenhouse gas impacts compared to the alternatives.

According to EPA's Clean Air Market Database, the Shawnee plant emitted 7,769,053 short tons of CO<sub>2</sub> in 2015. In the Draft EA, TVA states that alternatives B and C "would not result in impacts on climate change" because "[t]he additional energy required to operate the dewatering facility would not require enough of an increase in the amount of fossil fuel burned at SHF to have a noticeable impact on climate change." Draft EA at 22.

This analysis is flawed because it ignores the alternative of retiring the Shawnee plant, which would eliminate CO<sub>2</sub> emissions from the plant. Enabling the Shawnee plant to continue to operate by installing a dewatering facility to comply with the ELG rule would thus result in significant greenhouse gas emissions when compared to the retirement alternative.

2. Retirement would eliminate the generation and disposal of coal ash.

Similarly, the retirement alternative would result in far fewer impacts associated with the generation and disposal of coal ash. The Shawnee units currently each produce on average 36,000 tons of fly ash and 4,000 tons of bottom ash per year. Draft EA at 7. Under Alternatives B and C, that ash would be dried in piles before being transported to an on-site special waste landfill. While dry ash disposal would eliminate the need for wet ash impoundments, which are associated with surface and groundwater impacts and the risk of catastrophic spills, dry ash handling does not mitigate all environmental impacts. For instance, dry-handled ash can result in fugitive dust emissions, and dry ash landfills can still carry the risk of groundwater contamination. The Draft EA states that the Shawnee dry stack was placed in Groundwater Assessment status in February 2011, and that the most recent monitoring showed statistical exceedances for boron, calcium, chemical oxygen demand, total organic carbon, cobalt, iron, magnesium, manganese, molybdenum, nickel, pH, potassium, specific conductance, strontium, sulfate, and total dissolved solids—all coal ash constituents. Draft EA at 24.

As the US Department of the Interior noted in a letter to the TVA dated February 22, 2016, a portion of the Ohio River near the Shawnee Plant is federal designated critical habitat for the endangered rabbitsfoot, a freshwater mussel that is sensitive to contaminants such as coal

ash.<sup>31</sup> Any contamination to surface or groundwater resulting from coal ash disposal thus must be assessed for its impact on this critical habitat.

In contrast, retirement of the Shawnee plant would reduce coal ash generation and disposal to zero, and thus would result in significantly lower associated impacts.

3. Retirement would avoid air pollution impacts.

The retirement alternative would also eliminate the air impacts from coal combustion at the Shawnee facility. The Shawnee plant emitted 24,301 tons of SO<sub>2</sub> and 9,152 tons of NO<sub>x</sub> in 2015. TVA is in the process of installing pollution controls that it has said will result in “substantial reductions” in the emissions of acid gases, mercury, NO<sub>x</sub>, and SO<sub>2</sub>.<sup>32</sup> However, post-2017, continued operation of the Shawnee plant with controls on Units 1 and 4 would still result in annual NO<sub>x</sub> emissions of roughly 300 tons and annual SO<sub>2</sub> emissions of 240 tons, annual CO<sub>2</sub> emissions of at least 1.8 million tons; and annual PM<sub>2.5</sub> emissions of at least 100 tons.<sup>33</sup> Retirement would eliminate all of these air emissions.

4. Retirement would reduce impacts from water withdrawals needed to operate the dewatering facility.

According to the Draft EA, the dewatering facility’s configuration would reduce the amount of water used in the system from the current level of 19.44 million gallons per day (MGD) to 8.93 MGD, with an additional 0.865 MGD needed for the make-up/recirculation water streams if Alternative C were adopted. Draft EA at 8, 12.

While the closed-loop dewatering facility would thus reduce the amount of water withdrawn in comparison to current operations, retiring the plant would reduce the water needs to zero. This would reduce environmental impacts linked to water withdrawals, such as entrainment, entrapment and/or impingement, as well as impacts to surface water temperature that can be detrimental to aquatic life.

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<sup>31</sup> See letter to Ashley Farless, TVA, from Joyce Stanley, US DOI, “Re: Comments for the Notice of Availability of Draft Programmatic Environmental Impact Statement (DPEIS) for the Closure of Coal Combustion Residual Impoundments by the Tennessee Valley Authority (TVA), dated February 22, 2016.

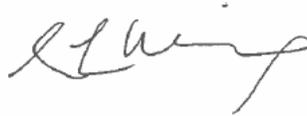
<sup>32</sup> Shawnee Unit 1 & 4 Draft EA at 3-6.

<sup>33</sup> Assuming 90% reduction of NO<sub>x</sub> and 96% reduction of SO<sub>2</sub> emissions, as assumed in the Shawnee unit 1&4 Draft EA at 3-6.

#### **D. Conclusion**

For the reasons outlined above, we request that TVA revise the Draft EA to consider retirement of the Shawnee plant as a practicable alternative to converting to a dry ash handling system, and include a proper analysis of the impacts of that alternative to the environment.

Respectfully submitted,



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