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**Re: Amended Testimony: Amazon Data Services, Inc. Project Facility: PHL100 Data Center Campus, Salem Township, Luzerne County, Pa. Application for consumptive use of up to 0.060 mgd (30-day average).**

Mr. Jason E. Oyler,Esquire

General Counsel,

Susquehanna River Basin Commission

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September 8, 2024

 I am Eric Epstein (“Epstein” or Mr. Epstein”), and have represented Three Mile Island Alert, Inc. (“TMIA”) either as Spokesperson or Chairman since 1984. I submitted comments to the Susquehanna River Basin Commission’s (“SRBC” or “the Commission”) in opposition to Amazon Data Service project proposal, i.e., PHL100 Data Center Campus SRBC Pending No.: 2024-056 on August 1, 2024. (1)

Amazon Data Services (“AWS” and “Amazon”) was granted a 1,600-acre rezoning request on May 30, 2024 on land adjacent Susquehanna Steam Electric Station (“SSES”). Amazon officials said the company hopes to construct 15 data center buildings over the course of the next decade.

Cumulus data center campus owner and nuclear power plant owner Talen Energy agreed to sell the facility to AWS for approximately $650 million. It is directly connected to the Susquehanna Steam Electric Nuclear Station. Cloud data service provider AWS will install its [hyperscale data center](https://www.microgridknowledge.com/data-center-microgrids/article/33010126/mgk-perspective) at the site. Talen’s Nautilus crypto data center was not part of the deal with Amazon.

The facility will involve consumptive use of water for evaporative cooling units for Building 2 and Building 3. No consumptive use is anticipated for Building 1. Consumptive use of 0.060 million gallons per day (“mgd”) (30-day average) is estimated for these operations. Operations for Building 2 which will trigger consumptive use of water are anticipated to begin July 2025. There are no planned outages during the operation of the data center campus. During maintenance, the consumptive and non- consumptive water uses will be the same as during regular operations.

Water for potable and evaporative cooling units will be supplied from the existing Production Well 1. The withdrawal rate from the well is limited to 25 gallons per minute (“gpm”). Pumped water from the well will be used to fill storage tanks at Building 2 and Building 3 before it is routed to the evaporative cooling units. Water that is not evaporated (bleed/non-consumptive) will be collected and discharged to the existing public sewer connection on site.

I am amending my testimony from August 1, 2024 to reflect

the applicant’s “water replenishment” policy. I provided testimony before the Susquehanna River Basin Commission (“the Commission” or “the SRBC”) opposing the above noted application based on the data centers’ adverse impact on the aquatic environment. (2)

 The Application failed to provide supporting data that

.060 mgd was enough water to cool the three centers, and there

was no mention of the negative impact on the aquatic ecosystem.

I am proposal that align with Amazon’s new policy initiative.

Amazon’s “water replenishment” policy has not been

included in the pending application. On August 28, 2024,

Amazon announced it was “committed to being a good water steward everywhere it operates," according to Kara Hurst, Amazon’s chief sustainability officer. "Doing our part to help address water scarcity is essential to overcoming health and economic risks for Amazon’s employees, customers, communities, and business. One of the ways AWS is innovating to help make a difference is by expanding on its water replenishment program to more places, which will return over 7 billion liters of water each year once all of the projects are completed. We also know we can't solve the water scarcity challenge alone, and are sharing our learnings with others to make an even bigger impact."

In 2023, according to Amazon, “AWS’s water replenishment portfolio returned 3.5 billion liters to local communities across 15 water replenishment projects. With six new projects announced today, a total of 21 projects will return over 7 billion liters of water each year once every project is complete.” (3)

<https://www.aboutamazon.com/news/sustainability/amazon-water-replenishment-projects-brazil-chile-china-us>)

 The company provided two examples of the “water replenishment” in Ohio and California.

In Ohio, AWS is supporting global non-profit [The Nature Conservancy](https://www.nature.org/en-us/) and others to restore 11 acres of wetlands. The project will slow down and filter water while providing wildlife habitat in Licking County just outside Columbus. This will reduce nutrient pollution in Buckeye Lake, a popular recreational attraction with a history of harmful algal bloom problems, and improve streams draining into the lake. The project is expected to be completed in 2026 and filter 77 million gallons of water each year. The combined funding from multiple companies will serve as a new repeatable model of corporate funding for water improvement projects.

In partnership with [River Partners](https://riverpartners.org/), a California-based nonprofit, AWS is helping to repair native ecosystems in some of California’s most imperiled river corridors. Central Valley salmon are not expected to survive the next decade without decisive, scaled-up action to restore their habitat. To help address this challenge, AWS is contributing to a diversified portfolio of twelve projects that include both wildlife and habitat benefits. For example, the project will reconnect rivers to floodplains and side channels, retire agricultural irrigation to conserve water and replenish freshwater ecosystems, enhance wildlife habitat that supports threatened and endangered species, and improve flood management. Upon completion in 2027, these projects will generate more than 1.6 billion liters of [volumetric benefits](https://www.wri.org/research/volumetric-water-benefit-accounting-vwba-method-implementing-and-valuing-water-stewardship) each year. (4)

 “Water replenishment” initiatives were absent for the current application. Moreover, Amazon’s calculations for the steps to cut water usage at its facility do not account for the water needs of power plants supplying electricity. Amazon’s underlying stress on electricity grids is compounded by the company’s the meter” approach to interconnection where Amazon does not pay distribution or transmission costs.

Exelon and American Electric Power (“AEP”) are protesting a proposal that would result in the co-location of an Amazon Web Services data center at Talen Energy’s Susquehanna nuclear plant in northeast Pennsylvania…

According to a declaration attached to Exelon and AEP’s protest, the ISA could result in the data center avoiding transmission costs of up to $140 million per year, shifting these costs to PJM customers.

Exelon and AEP argued that given the increasing development of data centers, the implications of this case are important. They claimed if this co-located load was permitted to avoid significant costs, other generators and large consumers might pursue similar arrangements.

“Should large quantities of load rush to co-locate with generation on terms that bear even a resemblance to the ISA at issue here, PJM capacity markets will have steadily decreasing volume as the capacity resources flee to serve load that uses and benefits from—but does not pay for—the transmission system and the ancillary services that keep the system running,” the parties said. “This will harm existing customers.” (5)

This is also an opportunity - if approved - for the SRBC to implement dry cooling criteria as an alternative.

(d) Project sponsors proposing new or significantly modified power generation plants in the basin shall consider the use of dry cooling technologies and submit to the Commission a rigorous alternatives analysis. This analysis shall include evaluation of the costs, benefits, trade-offs and drawbacks of various cooling and water conservation techniques, and a full evaluation of options for providing effective consumptive use mitigation. (6)

The company’s water stewardship goal doesn’t include the water consumed by the power plants that supply its data centers. This consumption can be as much as three to 10 times as large as the on-site water consumption at a data center, according to

Shaolei Ren, a professor of engineering at the University of California, Riverside, who studies data center water usage. As an example, Ren pointed to an [Amazon data center](https://www.ans.org/news/article-5842/amazon-buys-nuclearpowered-data-center-from-talen/) in Pennsylvania that relies on a [nuclear power plant less than a mile away](https://spectrum.ieee.org/space-based-solar-power-2667878868). That data center uses around 20 percent of the power plant’s capacity. “They say they’re using very little water, but there’s a big water evaporation happening just nearby, and that’s for powering their data center,” he said.

Talen Energy’s consumptive use is immense. The Susquehanna Steam Electric Station (“the SSES”) takes an average of 29.86 million gallons of water per day from the Susquehanna River that is not returned. The Extended Power Uprate doubled the amount of water that was needed with an upper limit of 65.4 million gallons per day, totaling almost 24 billion gallons of Susquehanna River Water per year.

The Susquehanna Steam Electric Station,

will withdraw an average of 60.9 gallons per day (mgd) (230 million L/d) of water from the Susquehanna River for cooling tower evaporative losses and other plant needs, with a maximum daily water withdraw estimate of 65.4 mgd (248 million L/d). This represents a 4.5 and 12.2 percent increase, respectively, in intake water withdrawn from the Susquehanna River from the pre-EPU conditions (NRC, 2007). Some of this water would be returned to the river as cooling tower blowdown, with the difference equaling the amount of the consumptive water use by SSES. Consumptive water use due to evaporation and drift of cooling water through the SSES cooling towers is expected to increase from 38 mgd (144 million L/d) to 44 mgd (166 million L/d). Based on the Susquehanna River’s annual mean flow rate, an average annual loss of 0.5 percent of river water at the SSES location would result. During low-flow conditions, which usually occur in late August, the average evaporative loss at SSES could approach 1 percent of the river flow (PPL 2006b). (7)

Companies like Amazon can reduce this secondary water usage by relying on renewable energy sources which don’t require as much water as traditional power plants. Hewes says the company has been trying to “manage down” both water and energy needs through a separate goal of operating on [100 percent renewable energy](https://www.nytimes.com/2024/07/10/business/energy-environment/amazon-clean-energy-climate-change.html). Ren points out that the company’s data centers need round-the-clock power, which means intermittently available renewables like solar and wind farms can only go so far. (8)

Please include four stipulations in the Application in Amazon Data Services, Inc. Project Facility: PHL100 Data Center Campus, Salem Township, Luzerne County, Pa. proposed application for consumptive use of up to 0.060 mgd (30-day average).

1. Encourage dry cooling for additional water consumption requests.
2. Monitor and provide records of water temperature at the point of discharge.
3. Provide renewable energy as backup power when the SSES is shut down for refueling.
4. Implement Amazon’s “water replenishment” by monitoring and protecting wetlands by establishing conservation easements in sensitive areas.

Respectfully submitted,

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 1 Federal Register/Volume, 89, Number, 56/Thursday, March 21, 2024/Proposed Rules.

2 PPL made a presentation to the Susquehanna River Basin Commission on June 23, 2011 for a “Conceptual Proposal to Develop and Implement a Corporate Storage Asset Pool for Consumptive Use Mitigation.”

 There were also several reports completed for the Susquehanna River. The Consumptive Use Mitigation Plan – SRBC 2008, Ecosystem Flow Recommendations for the Susquehanna River Basin – The Nature Conservancy 2010, and the draft Susquehanna River Management Plan – PA Fish and Boat Commission 2011. All three reports make statements that the existing requirement for the mitigation of the Q7-10 flow rates does not adequately protect the ecosystems of the Susquehanna River.

The following paragraphs from the Susquehanna River Management Plan draft best express the concerns about the future consumptive use increases in the Susquehanna River Basin:

A potentially significant threat to aquatic communities in the Susquehanna River Basin is increased consumptive use (“CU”) of water to meet expanding societal demands for water. CU is defined by SRBC as water that is used in a way it is not returned to the basin, including through evaporation, irrigation, use in products and diversions out of the Susquehanna watershed. Consumptive water use regulation, adopted by the SRBC in 1976 and most recently updated in November 2010, requires project sponsors to provide mitigation, either through providing compensatory water or fees, for their water use during low flow events. The maximum current use potential in the basin is estimated to be 882.5 million gallons per day (mgd) and is projected to increase to 1,202.2 mgd by 2025 of which, mitigation is required for 116.7 mgd and 390.3 mgd, respectively. Historically, actual usage falls somewhat below the actual permitted usage, but management based on permitted values allows for more conservative estimates for resource protection (SRB, 2008).

The most recent CU mitigation plan has recognized the need for revised mitigation thresholds from the historic Q7-10 threshold to be more responsive to demonstrated aquatic and riparian resource needs, potentially including recently observed disease-related mortality of smallmouth bass and largemouth bass in the Susquehanna River and major tributaries. The 2008 Plan quantifies the need to secure more storage to achieve mitigation flows at the permitted levels, and the SRBC is currently working with partners to develop and acquire innovative storage options in order to set more protective/responsive CU mitigation goals (SRBC 2008).”

3 “Amazon says it’s going ‘water positive’ — but there’s a problem The company’s pledge to conserve water at its data centers doesn’t account for the thirsty power plants that keep them running,” (“Grist,” August 27, 2024.)

4 “Amazon says it’s going ‘water positive’ — but there’s a problem The company’s pledge to conserve water at its data centers doesn’t account for the thirsty power plants that keep them running,” (“Grist,” August 27, 2024.)

5 “Exelon and AEP protest interconnection agreement for utilities argue the proposal could unfairly shift costs to ratepayers and impact market operations and reliability, according to a FERC filing,” “Power Engineering,” June 27, 2024.)

6 Before the Susquehanna River Basin Commission, Notice of Proposed Rulemaking Modifying 18 CFR Part 801, Review and Approval of Projects.

7 Expert Witness Report of Arnold Gundersen, Re: Bell Bend Nuclear Power Plant Application for Groundwater Withdrawal Application for Consumptive Use, BNP-2009-073, Susquehanna River Basin Commission, January 5, 2010.

8 “Amazon says it’s going ‘water positive’ — but there’s a problem The company’s pledge to conserve water at its data centers doesn’t account for the thirsty power plants that keep them running,” (Grist,” August 27, 2024.)