August 28, 2026

The Honorable Charles Perry, Chair
The Honorable Kevin Sparks, Vice-Chair
The Honorable Members Blanco, Gutierrez, Hinojosa, Kolkhorst, and Menéndez
Senate Committee on Water, Agriculture and Rural Affairs

Re: **Assessing the Water Demands of Energy-Intensive Technologies**

The Greater Edwards Aquifer Alliance (GEAA) is a nonprofit organization dedicated to the protection and preservation of the Edwards and Trinity aquifers, their springs, watersheds, and the Hill Country that sustains them. Our alliance has 59 member groups across 21 counties in the Texas Hill Country. We work to ensure the protection of the health, safety, and welfare of all those who rely on these sources of water. We recently released a white paper on data center challenges and recommendations in Texas and appreciate the opportunity to provide the following comments on this charge. Some portions of this testimony are pulled from our white paper.

Introduction

Data centers have become a linchpin of our modern economic systems, especially as artificial intelligence (AI) technologies become more embedded in our lives and economy. As Texas becomes a leader in AI-related data centers, the state faces many distinct but interconnected challenges that make it an imperative to ensure data centers are constructed, operated, and regulated in a responsible manner.

Population growth, cyclical and intensifying drought conditions, increasing temperatures, more sporadic and intense rainfall, and aging infrastructure combine to push the state's electrical grid and water utilities to the breaking point. Without appropriate regulation and adequate guardrails, data centers and similar fast-growing industries could push energy and water systems in Texas over the edge, raising prices for Texans and leading to water shortages and heavy strains on the electrical grid.

The recommendations provided herein stand to make Texas stronger and more resilient; they should be implemented even if data centers end up as less of a challenge to the state's resources than expected. Wherever the next major threat to energy and water supplies arises – such as from semiconductor chip manufacturing, cryptocurrency mines, or other technology innovations – putting in place the outlined recommendations will help Texas be better prepared for generations to come.

Direct and Indirect Water Uses

The growth in the data center sector "could increase total statewide water demand by as much as 10 percent compared to current planning assumptions."[1] This increase comes even as the draft 2027 State Water Plan predicts a 3.6 million acre-feet water shortage by 2030 and a 5.8 million acre-feet water shortage by 2080.[2] The state water planning process does not take into account the accelerating demands of the data center industry.

The Houston Advanced Research Center estimated that Texas data centers used nearly 77,000 acre-feet of water for direct and indirect water consumption in 2025, which could increase to between 98,000 and 484,000 acre-feet of use by 2030.[3] Water used for cooling – i.e., direct water use – is expected to triple from 2025 levels over the next two years, and local water availability for cooling is expected to become a critical siting factor for data centers. And "while the total statewide water use might appear low in percentage terms, this number is significantly higher in many water-stressed areas; additionally, *water use will likely be much higher than the current estimates*"[4] (emphasis added).

Furthermore, indirect demand for water for generating electricity for data centers far surpasses direct demand, accounting for 75-83% of total data center water demand. For example, one hyperscaler company's indirect water consumption embedded in electricity was 20 times higher than its direct water consumption.[5] In 2023, a study determined that U.S. data centers' indirect water footprint was 12 times as big as their direct water footprint and was expected to double by 2028 (this study is now considered to be out of date and the numbers are expected to be much higher due to behind-the-meter generation and AI acceleration).[6] And, manufacturing the computer chips needed for operation also requires vast amounts of water, amounts that are also predicted to double across the industry by 2035.

An average midsized data center could use around .92 acre-feet per day, equivalent to the use of 1,000 homes. A large data center could use around 13.8 acre-feet per day, equivalent to the use of 15,000 homes. The facilities being built or proposed in Texas today are large-scale facilities. Yet, it is difficult to firmly grasp just how much water data centers are using in Texas. There are few current statewide mechanisms to require direct and indirect water usage disclosure, evaluate cumulative impacts, or forecast large water use trends. In fact, according to the Bureau of Economic Geology at the University of Texas:

> "Most data centers do not readily report detailed facility-level data on water withdrawals, blowdown volumes, discharge quality, or system losses, limiting water suppliers' ability to forecast load growth, infrastructure stress, or treatment capacity needs. This lack of transparency limits municipal water suppliers and wastewater utilities from accurately forecasting demand, planning infrastructure, or managing treatment and regulatory compliance… This lack of standardized and comprehensive reporting complicates forecasting, increases uncertainty in utility-side capital planning, and raises the risk of stranded assets, regulatory noncompliance, and unanticipated operational burdens for both water supply and wastewater utilities."[7]

Water-Efficient Data Center Development Considerations

In facilities using standard evaporative cooling systems, the water used evaporates and is not returned to the watershed or to the local water cycle, potentially deteriorating local conditions. Even for facilities that are increasing their efficiency, total demand for water is growing faster than it can be supplied due to the rapid pace of AI development. In fact, "*absolute water consumption continues to grow even as cooling technology improves…[and] efficiency alone cannot offset this growth indefinitely*"[8] (emphasis added).

While closed loop cooling systems are a definitive upgrade from evaporative cooling systems and are often promoted as a solution to the high water use of data centers, they still often require significant amounts of water. The water within the closed loop can indeed be reused, but water must still be withdrawn to initially supply the system and to refill any water lost to evaporation when the water itself is cooled down or when the supply becomes too degraded to be reused. Additionally, even facilities with water-efficient closed-loop systems may request significant water supplies in their permits or utility requests to accommodate cooling needs during peak heat and summer conditions, when closed loop cooling may be less efficient than evaporative cooling.

Data centers relying on water for cooling do not need to use potable water supply sources. Amazon plans to expand the use of recycled wastewater to more than 120 locations across the U.S., up from 24 sites.[9] Google is pursuing alternative and reclaimed cooling solutions,[10] while Microsoft "has expanded the use of reclaimed and recycled [waste]water at data center sites in Texas, Washington, California, and Singapore, among other locations."[11] Microsoft has also begun to integrate rainwater capture and reuse in certain European facilities.[12]

Data centers can currently realistically optimize their on-site operations for either energy efficiency or water efficiency, but not both. Many facilities are choosing to switch to some form of water-based cooling. Air-cooled systems are significantly more energy-intensive than water-based cooling systems and “are increasingly unable to dissipate the high thermal loads generated by modern high-density server racks.”[13]

While air-cooled systems may seem at first glance to be the most water-efficient mechanism to cool data centers, these energy intensive systems have higher indirect water costs. Energy utilities have delayed retiring thirsty coal and natural gas power plants and are adding new natural gas plants in order to keep up with data center-driven demand. Even with these delays and investments, “tech companies are now building their own fleet of private power plants, mostly fueled by natural gas power plants.”[14]

Assuming coal, nuclear, and natural gas power sources consume water at their current rate, these sources have much higher ongoing water withdrawal and consumption intensities than renewable sources like solar + battery and wind power.[15] Studies show that adding wind, solar, and battery storage to the state’s power grid could “result in a net 26% decrease in water use with ripple effects of decreased indirect water use across all other users of the Texas grid.”[16] Hyperscaler companies have articulated that “*sourcing clean energy like wind and solar is one of the most effective ways to save water*” (emphasis added).[17]

Counties in Texas are granted the authority “to promote the health, safety, morals or general welfare of the county and the safe, orderly, and healthful development of the unincorporated area of the county.”[18] Yet counties can place few, if any, restrictions on where and how data centers can be constructed and operated, leaving Texans in unincorporated areas more exposed to the most immediate impacts of data center siting, construction, and operation. Counties have few tools with which to encourage sustainable water use practices, and many operations are choosing to site in unincorporated areas.

Groundwater conservation districts (GCDs) are often in charge of permitting wells used by data centers or by utilities from which data centers source their water. Many GCDs are facing threats of legal action related to enforcement, constrained budgets and a lack of staff, limited authority in their enabling legislation, and a lack of sufficient data. Some GCDs are far more constrained than others, placing the aquifers under their jurisdiction at greater risk of depletion. Meanwhile, there are substantial portions of the state – the so-called “white spaces” or “unprotected areas” – where residents and industry are dependent on groundwater but there is no GCD present, leaving groundwater supplies at greater risk of depletion.

Policy Recommendations

Our white paper highlights many recommendations to respond to the challenges and public concerns related to the rapid proliferation of data centers in Texas – the following are highlighted due to their explicit connection to the charge of this hearing. We do not necessarily advocate for any one specific cooling technology or facility design. Rather, we encourage facilities to adopt the best available technology and processes that are water efficient and recognize that those technologies may change faster than legislation can respond.

It is important to note that the following recommendations should not be solely restricted to data centers; it is critical that conversations surrounding data centers do not hide the forest for the trees. There are many industries emerging across the state, including computing and space tech manufacturing campuses, cryptocurrency mining facilities, and semi-conductor chip fabrication plants that place similar (if not greater) demands on the state’s water and energy supplies. The legislature should take care to ensure that whatever measure is taken with regards to data centers does not leave the state back in the same position it is in currently in three-, five-, or twenty-years’ time with whatever the next high demand industry may be.

- Mandate Water and Energy Use Reporting and Public Access and Improve Transparency

Without appropriate data, it is impossible to prepare for the impacts of an industry and to safeguard Texans. To account for the demands placed on local and regional water supplies, the legislature should require data centers to report their peak and annual direct water use and water sources to the TWDB and TCEQ and require the TWDB to make this information publicly available. To account for the energy demands placed on the state’s electrical grid and for the indirect water use of data centers, the state legislature should also require data centers to report their peak and annual energy use and source to the PUC and ERCOT and require the PUC to make this information publicly available. Texas should stop relying on voluntary surveys submitted by the industry to plan its future. The state should also ensure that the public and press have access to water and energy use utility data.

The state should make the PUC and TWDB surveys regarding water and energy use for data centers and crypto currency mines publicly available and should amend state code to ensure that utilities are able to release water use information for industrial and commercial users. The state should also strictly limit local governments, utilities, and state agencies from entering any NDAs that would prevent elected officials or staff from releasing information to the public, prevent the public from knowing the companies behind the proposed development, or prevent the public from accessing details about the development and its impact, especially around information related to direct and indirect water use and sources. The state should ensure agreements or contracts that violate these provisions are void and unenforceable.

- Require Data Center Water Use to be Included in TWDB State Water Plan

Texas' water planning process is not expected to take hyperscale data center water use into account until at least 2032. Yet many of the industry's estimates predict there will be significant growth in this sector before then. By not accounting for the current and predicted demands of data centers, Texas is limiting its ability, and the ability of its local governments, to estimate the need for future water supplies, infrastructure, and funding.[19] The state should direct the TWDB to immediately begin to define and account for hyperscale data center water use in the state water planning process. The state should also direct the TWDB to require future water use estimates from water users in the state, to better ensure the state water appropriately accounts for future demand. Again, the state should stop relying on voluntary surveys to plan its future.

- Require or Incentivize Use of Non-Potable Water Supplies

Many proposed projects highlight their facility's planned use of closed loop cooling in place of evaporative cooling as a water saving measure. While closed loop cooling systems use significantly less water than strictly evaporative systems, they are not necessarily water neutral. Closed loop systems can still use up to 500 million gallons of water per year, with significant peak demands when outdoor temperatures rise.[20] These peak demands will place significant pressure on water systems, as data center peak demand occurs at the same time as municipal and often agricultural peak demand.

The state should require or incentivize the use of non-potable supplies such as recycled municipal wastewater, rainwater, atmospheric harvested water, brackish groundwater, and recycled produced water as the primary water supplies for on-site cooling. At minimum, these sources should supplement any potable water or fresh groundwater used on site. Using alternative or non-potable sources "can lower operational costs by 25-30% over the facility's lifetime."[21]

Data centers are able to use recycled municipal wastewater for cooling with some additional levels of treatment, as it is already treated to a high standard. If data centers are located in or near an urban or fast-growing rural community, they are likely to already be located near an existing wastewater treatment plant. By using recycled wastewater to supply a facility's cooling water and additional non-potable water needs, data centers can relieve pressures on municipal drinking supplies or groundwater sources.

On average, 30,000 gallons of water can be collected from an inch of rain falling on one 50,000 square foot roof – many data center roofs are two to 20 times that size. Rainwater harvesting can supplement a significant portion of a data center's water needs, though often not the entirety. RWH offsets the pressure placed on the water supplier, reduces the amount of potable water used for non-potable purposes, mitigates drainage issues, and reduces the need for significant infrastructure upgrades.

Operating a data center generates a significant amount of low-grade heat, and atmospheric water harvesting systems can use that heat to generate a water supply. In harvesting water "directly from the self-replenishing atmosphere, the supply is entirely decentralized and independent of municipal networks or aquifers."[22] As an additional benefit, the water produced by AWH is considered ultra-pure, free of corrosive salts and minerals that could damage computing equipment. And if paired with solar power, the operating costs of AWH systems may be significantly lessened.

Produced water is more expensive and difficult to treat to appropriate standards than other forms of non-potable water, but its use in cooling would lessen pressure on municipal water supplies and provide the oil and gas industry with a beneficial disposal option. The Texas Produced Water Consortium predicts there could eventually be up to 515,573 acre-feet of produced water available per year for beneficial uses such as industrial cooling as research continues and treatment costs scale down.

While treatment costs for brackish groundwater are greater than they would be for municipal water, "several hyperscale data centers are already exploring or implementing brackish water strategies."[23] Similar to other alternative water supply sources, brackish groundwater use can ease demands on existing potable supplies. Data center operators in Texas who are considering brackish groundwater for cooling should consult with the local GCD, if present, before pumping and must ensure their pumping does not lead to saltwater intrusion of freshwater sources or to subsidence.

- Encourage Liquid Immersion Technologies

Immersion cooling involves "submerging electronic components…in a non-conductive liquid that efficiently absorbs their heat and transfers it to a heat exchanger."[24] Immersion cooling does require higher upfront costs than other systems, due to the cost of the liquid and the cost of the unique computing equipment that can withstand being submerged. However, immersion cooling has significant energy savings – thereby lowering indirect water use – and significant direct water use savings. Energy use can be reduced by up to 50% and water consumption by up to 91% compared to traditional air-cooling methods, making long term operating costs lower.

- Incentivize Renewable Energy Generation and Limit Restrictions on Renewables

Electrical generation is where the bulk of data center water use occurs if the generation relies on fossil fuels. Natural gas power plants require 2,800 gallons of water consumption for every MWh generated. Solar and wind energy requires almost none. Natural gas uses around 50 times more water than solar and 1000 times more water than wind. Already nearly 40% of tech companies "now incorporate solar arrays directly at their facilities, while 36% utilize battery storage to mitigate fluctuations in supply."[25] Further restricting renewables would not only place greater pressures on Texas' water supplies, it could also cost Texans a 14% increase in power prices by 2035.[26] Other states have encouraged or required data center companies to enter deals with utilities to fully fund "wind turbines, solar panels, and battery storage, as well as the costs of grid infrastructure upgrades to serve data centers."[27] To preserve the state's water supplies, Texas should do the same.

- Increase Energy Efficiency and Water Conservation

Energy efficiency and water conservation help utilities avoid or delay the need for new energy generation and transmission (which lowers indirect water demand) and new water supplies by lowering peak demand.[28] To protect water supplies, Texas should set strong energy and water efficiency standards, increase investment in energy and water efficiency, increase statewide minimum building standards, require utilities to set and enforce water conservation plans, and allow counties to adopt modern building codes and standards.

- Expand County Authority for Land Use Regulations and Drought-Related Actions

County governments are unable to adequately protect local water supplies from new and high demands of an emerging industry. They are also unable to adequately protect residents from local water quality and flooding concerns that may arise as a result of industrial siting in unincorporated areas. To protect residents currently at the most risk of the adverse impacts of data centers, the legislature should grant counties the authority to, if they so choose, implement stricter land use regulations related to commercial and industrial developments. Such expanded authority related to water could include authority to impose impervious cover limits, watershed protection ordinances, incompatible land use regulations, and open space requirements.

The state could also grant counties the authority to assess drainage fees and impact fees for new industrial developments to account for the strain the industry may place on local water supplies and infrastructure. Furthermore, to ensure counties can protect their residents' access to safe and adequate water supplies, the state should allow counties to impose development moratoriums during water shortages, certain drought stages, or a set period of time in which the state will revise or develop rules under which to regulate data centers.

- Treat Discharge Water to Drinking Water Quality

Wastewater discharged from data centers can reenter the local water utility's wastewater stream, potentially "straining municipal wastewater treatment plants and potentially exceeding local infrastructure capacity – especially in water-scarce regions."[29] The wastewater itself may contain constituents for which public treatment plants are underequipped to handle, which may create water quality risks downstream. To relieve burdens placed on public utilities, keep rates low for existing customers, and reduce water quality risks, operators should consider treating their wastewater to drinking water standards before discharging it back into the system.

- Expand or Reform Groundwater Conservation District Authority

Many data centers in Texas will likely rely on groundwater wells for on-site water needs or will utilize municipal water drawn from groundwater supplies. Unless a facility is located in a "white space," a GCD will likely be in charge of permitting the wells used. Texas should grant all GCDs full Texas Water Code Chapter 36 authority, at minimum, and should shield GCDs from liability for actions taken to meet desired future conditions and drought contingency plan limits to pumping. Where there are no GCDs present, the state should create new GCDs or expand the boundaries of existing GCDs. Texas should also increase investment in groundwater data and modeling tools and in financial and technical assistance for GCDs.

- Encourage Community Benefit Agreements and Community Investments

Local governments can negotiate with companies proposing to build data centers through community benefit agreements. Some communities in Texas have already utilized this option to balance data center growth opportunities with community interests, and some major companies have highlighted their willingness to invest in local watersheds. The state should encourage local governments to enter transparent, publicly accessible agreements which are subject to legal safeguards and enforcement. These agreements should be in the best interest of the public and of the long-term sustainability and quality of local water supplies. The state should also encourage data center companies to increase investment in water replenishment projects, water infrastructure projects, and local water efficiency measures or programs.

- Restrict State Tax Exemptions

To protect Texas taxpayers, the Legislature should eliminate, strongly pare back, or place strict limits on the state level data center tax exemptions. If the state decides to continue to move forward with these exemptions, the facilities should be required to meet much stricter parameters, including, among others, higher job creation and retention minimums, tax revenue minimums, strong and sustainable water and energy conservation provisions, community investment provisions, decommissioning terms and bonds, and term limits of three to five years. In the meantime, the state should ramp up its auditing and enforcement of qualifying facilities.

One to two billion dollars a year could help alleviate many of the pressures facing the state today. Regardless of whether the legislature chooses to restrict data center tax exemptions, there are other measures the state could take to ensure Texas tax- and ratepayers are protected. The state should establish fees on data centers that are assessed proportional to the industry's impact on local and state resources. These fees could pay into water supply, infrastructure, energy, and flood mitigation funds across various state agencies.

Conclusion

Texans are increasingly concerned about the adverse impacts that record-breaking data center development and operation may have on their pocketbooks, on their community, and on the state's natural resources. Texas lawmakers must balance these concerns with ensuring economic growth and with maintaining its position as a leader in innovative technology. The recommendations provided above are intended to help lawmakers achieve this balance between the economic benefits and day-to-day integration of data center-supported functions with the protection of Texans and the state's water supplies. The weight of this balance, however, should always fall on protecting Texas' residents, resources, and communities.

Our state is rightfully proud of its history of leading the rest of the nation in growth and innovation; we have the opportunity to lead again. With the right guardrails, Texas can again lead the nation, this time in responsible data center development. Thank you for your consideration. Please do not hesitate to consider the Greater Edwards Aquifer Alliance as a resource on this issue moving forward.

Sincerely,

Annalisa Peace
Executive Director
Greater Edwards Aquifer Alliance

Rachel Hanes
Policy Director
Greater Edwards Aquifer Alliance

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