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Data Center Development and Nexuses to CWA Program Implementation

The rapid expansion of data centers associated with artificial intelligence, cloud computing, and digital infrastructure is creating a new and increasingly complex set of implementation challenges under the Clean Water Act (CWA). Although data centers have historically received limited attention within water quality regulatory programs, the scale, concentration, and operational demands of modern facilities are prompting state and federal regulators to reevaluate how existing CWA frameworks apply to these developments. Water-intensive cooling systems, large wastewater flows, growing reliance on reclaimed water, and significant supporting energy infrastructure are bringing data centers into closer intersection with nearly every major component of CWA implementation, including water quality standards, NPDES permitting, total maximum daily loads (TMDLs), water reuse programs, pretreatment requirements, and Sections 401 and 404 permitting authorities. This memo outlines the key issues, identifies emerging gaps, and highlights strategic considerations for state regulators and ACWA members.

Background and Context

Water supply and consumptive use concerns are among the most visible issues associated with data center development. Facilities supporting high-density computing operations can require substantial volumes of water for cooling and heat management, particularly where evaporative cooling systems are used to improve energy efficiency. In many regions, especially arid and drought-prone areas, these withdrawals are raising concerns regarding groundwater depletion, reduced streamflows, competition with municipal and agricultural users, and long-term water supply planning. Increasingly, regulators and utilities are also confronting questions regarding transparency in water use, as many operators disclose limited information concerning withdrawal volumes, consumptive use, cooling technologies, wastewater generation, and chemical usage.

At the same time, wastewater discharges from data centers are creating emerging water quality and permitting issues that do not fit neatly within traditional industrial regulatory frameworks. Cooling tower blowdown, thermal discharges, equipment wash water, and indirect discharges to publicly owned treatment works (POTWs) may contain elevated temperatures, salts, nutrients, metals, treatment chemicals, and emerging contaminants. Wastewater utilities have expressed growing concern regarding high-volume “slug loads,” elevated salinity, and the discharge of biocides, anti-scaling chemicals, and corrosion inhibitors that may interfere with biological treatment processes or biosolids management. Existing water quality standards and implementation procedures were generally developed around more conventional municipal and industrial discharges and may not fully account for the characteristics of reuse-derived cooling water or concentrated wastewater streams associated with modern data center operations.

The growing use of reclaimed wastewater for cooling further complicates CWA implementation. Many states and utilities are encouraging reuse as a strategy to reduce potable water demand, but reclaimed water often contains elevated concentrations of nutrients, total dissolved solids, trace organics, pharmaceuticals, and other contaminants that may become concentrated through cooling processes. Water reuse can also alter watershed hydrology by reducing return flows historically relied upon for instream flows, downstream water rights, and assimilative capacity calculations. These issues are especially significant in watersheds already subject to nutrient or thermal impairments, TMDLs, or limited assimilative capacity.

Data center growth is also intensifying broader regulatory and policy debates regarding cumulative impacts, environmental justice, climate resilience, and the energy-water nexus. In rapidly developing regions, multiple facilities may collectively contribute to increased thermal loading, wastewater treatment constraints, groundwater depletion, and increased energy demand, even where individual permits appear protective in isolation. State agencies are increasingly being asked to evaluate whether existing permitting programs, pretreatment standards, water quality criteria, and watershed planning assumptions remain adequate in the face of accelerating infrastructure expansion associated with AI development.

At both the federal and state levels, policymakers are beginning to respond. Some states are developing data center-specific permitting frameworks, transparency requirements, or wastewater monitoring programs, while federal agencies are considering permitting streamlining initiatives, reuse guidance, and voluntary treatment standards tailored to data center operations. Nevertheless, significant regulatory gaps remain, including limited effluent guidelines specific to data center wastewater streams, inconsistent state reuse regulations, uncertainty regarding PFAS and emerging contaminants, and insufficient guidance concerning cumulative watershed impacts.

Primary CWA Implementation Issues

- **Water Supply Issues**

    - **Source Water Depletion / Evaporative Losses:**

      Data centers, particularly facilities supporting artificial intelligence and high-density cloud computing, can require substantial volumes of water for cooling and heat management. Water demand varies significantly depending on climate, cooling technology, computing intensity, and whether facilities rely on evaporative or closed-loop systems. In arid and semi-arid regions, these demands have generated increasing concern among regulators, utilities, and local communities regarding long-term water availability and competing demands.

      Cooling system selection is especially important because it strongly influences both water and energy demand. Air-cooled systems typically reduce water consumption but may increase electricity demand and reduce operational efficiency during high-temperature periods. Conversely, evaporative cooling systems generally improve energy efficiency but increase consumptive water use.

      Facilities using evaporative cooling consume water through evaporation losses that permanently remove water from the local hydrologic system. Unlike once-through cooling systems that return most water to the source waterbody, evaporative cooling systems consume a large portion of withdrawn water. In some regions, this consumptive use can exacerbate groundwater depletion, reduce streamflows, or affect reservoir operations during drought periods.

      Data centers typically rely on one or more of the following water sources:

- Municipal potable water systems, often the default supply in urban and suburban areas;
- Groundwater withdrawals, particularly in regions with limited surface water infrastructure;
- Surface water diversions from rivers, lakes, or reservoirs; and
- Reclaimed or reused water supplied by publicly owned treatment works (POTWs).

Increasingly, states and local governments are evaluating whether large-scale data center development is compatible with existing water supply planning assumptions. In rapidly developing regions, regulators may need to assess cumulative impacts associated with multiple facilities located within the same watershed or aquifer system.

- **Transparency in Water Use**

Water use transparency has become one of the central policy issues surrounding data center development. Historically, many operators disclosed limited information regarding water withdrawals, discharge volumes, cooling technologies, or wastewater characteristics. This has complicated planning efforts by state regulators, local governments, utilities, and wastewater treatment providers.

Key transparency issues include:

- Identification of water supply sources and backup supplies;
- Annual average and peak daily withdrawal volumes;
- Consumptive versus non-consumptive use;
- Seasonal variability in water demand;
- Relationships between energy consumption and cooling water demand;
- Wastewater discharge characteristics; and
- Water reuse and recycling practices.

Several states have begun considering legislation requiring disclosure of water use information. Federal proposals such as the Data Center Water and Energy Transparency Act of 2026 would require reporting of facility-level water and energy consumption during the first five years of operation and authorize enforcement actions for failure to comply with state reporting requirements.

- **Strains on POTW Capacity:** Indirect discharges to publicly owned treatment works (POTWs) are also becoming a significant issue. Large data centers can impose substantial hydraulic and pollutant loading on wastewater treatment systems, particularly where facilities discharge concentrated cooling water blowdown or "slug loads" during startup and maintenance events. Wastewater utilities have raised concerns regarding biocides and other chemicals that may inhibit biological treatment processes, elevated salinity levels that interfere with treatment performance or biosolids management, and the limited disclosure of proprietary chemical formulations used in cooling systems. These concerns may require POTWs to revise local pretreatment limits, expand monitoring programs, or impose additional pretreatment requirements on data center operators.

- **Water Quality Standards**

    - **Temperature and Thermal Criteria:** Cooling water discharges, even when intermittent, can elevate receiving water temperatures and affect designated aquatic life uses. Existing temperature criteria—often developed for continuous discharges or natural background conditions—may be difficult to apply to episodic or highly variable thermal loads.

    - **Chemical and Narrative Criteria:** Cooling systems commonly use chemical additives to control scaling, corrosion, and biological growth. While many of these chemicals are regulated, the specific mixtures and transformation products present in blowdown discharges may not be fully characterized. This raises questions about the adequacy of existing numeric criteria and the reliance on narrative standards such as prohibitions on toxics in toxic amounts.

    - **Antidegradation Policies:** Antidegradation policies also play a critical role, particularly in high-quality waters. New or expanded data center discharges may trigger antidegradation reviews requiring states to evaluate whether lowering water quality is necessary to support important economic or social development. These determinations can be complex, especially where multiple facilities are proposed within the same watershed, raising cumulative impact concerns.

    - **Designated Uses and Changing Demand:** Rapid industrial growth associated with data centers may place new pressure on waters historically managed primarily for municipal, agricultural, or ecological uses. Regulators may need to evaluate whether existing designated uses and implementation assumptions remain appropriate as industrial water demand patterns evolve.

      Potential issues include:
        - Protection of cold-water fisheries and aquatic habitat;
        - Maintenance of recreational uses during low-flow periods;
        - Impacts to downstream municipal water supplies; and
        - Increased competition for limited assimilative capacity.

    - **Water Reuse and Water Quality Standards:** Many states and utilities are encouraging data centers to use reclaimed wastewater rather than potable supplies. While reuse may reduce freshwater withdrawals, it also creates implementation challenges under water quality standards programs.

      Reclaimed water may contain elevated concentrations of:
        - Nutrients;
        - Total dissolved solids (TDS);
        - Chlorides and sulfates;
        - Trace organics;
        - Pharmaceuticals and personal care products;
        - Metals; and
        - Emerging contaminants.

These constituents can affect cooling system performance and may influence the quality of resulting blowdown discharges. States may need to determine whether existing criteria and implementation procedures adequately address concentrated reuse-derived wastewater streams.

- **PFAS:** PFAS are emerging as a significant issue associated with data center infrastructure. PFAS compounds are used in certain advanced cooling technologies, semiconductor manufacturing processes, and fire suppression systems. Two-phase immersion cooling systems have received particular scrutiny because some systems use fluorinated compounds that may degrade into trifluoroacetic acid and related substances. Although direct discharges from closed-loop systems may be limited, broader supply chain impacts associated with PFAS production and disposal have generated increasing concern.

- **Nitrates**: Nitrate pollution associated with data center operations is emerging as a growing groundwater and water quality concern, particularly in regions where large facilities rely on evaporative cooling systems, reclaimed wastewater, on-site wastewater management, or indirect discharges to publicly owned treatment works (POTWs). Although data centers are not traditionally viewed as major nutrient-generating industries, their scale, cooling practices, and wastewater management approaches can contribute to nitrate loading under certain conditions, especially where multiple facilities are concentrated within the same watershed or aquifer system.

  One important pathway involves the use of reclaimed or recycled wastewater for cooling operations. Reclaimed water supplied by POTWs often contains residual nitrogen compounds, including nitrate and ammonia, even after secondary or advanced treatment. As this water circulates through evaporative cooling systems, dissolved constituents become increasingly concentrated. Cooling tower blowdown and other wastewater streams may therefore contain elevated nitrate concentrations relative to the original source water. Where these discharges are released to surface waters, land application systems, infiltration basins, or wastewater treatment systems, they can contribute to cumulative nutrient loading and groundwater contamination.

  Indirect discharges to POTWs can also create nitrate-related concerns. Large data center campuses may generate high-volume wastewater discharges associated with cooling tower blowdown, equipment cleaning, and water treatment operations. These discharges can increase nitrogen loading at municipal wastewater facilities, particularly where utilities already face nutrient permit limits or are operating near treatment capacity. If treatment systems are not designed for enhanced nutrient removal, elevated nitrogen loads may ultimately pass through to receiving waters or contribute indirectly to groundwater contamination through effluent reuse, biosolids application, or infiltration practices.

- **NPDES Permitting:** The CWA requires that any point source discharging pollutants to waters of the United States obtain coverage under the NPDES. For data center facilities, permit coverage may be required for a range of discharge pathways, including construction stormwater, industrial stormwater, cooling system wastewater (such as blowdown), equipment wash water, and other operational effluents. As data center development expands, state permitting authorities are increasingly being called upon to address facility-specific discharge characteristics and develop tailored permitting approaches. In response, some states—including Ohio—have already begun drafting or considering general permits specifically designed to address wastewater and stormwater discharges associated with data center operations.

- **Unintentional Direct Discharge**
  While the facility may intend to avoid discharge to a WOTUS, there still may be a "functionally equivalent" discharge via ground/groundwater as determined by several criteria: transit time, distanced traveled, manner of entry and nature of the medium, volume of pollution, dilution impact, chemical alteration, and whether the pollutant retains its identity.

- **Intentional Direct Discharges**

  - **Cooling tower blowdowns:** For facilities with direct discharges, cooling tower blowdown is often the primary wastewater stream of concern. These discharges may contain elevated temperatures, high total dissolved solids, and residual treatment chemicals.

    Cooling water accumulates minerals, heavy metals and other contaminants as it circulates, and many centers often add corrosion inhibitors and disinfectants to prevent microbial growth.

  - **Equipment wash water:** NPDES permitting of equipment wash water at data center facilities raises a set of emerging but often underdefined regulatory issues because these discharges fall outside traditional industrial categories while still potentially containing a mix of pollutants associated with facility operations and maintenance activities. Equipment wash water is typically generated from routine cleaning of cooling system components, backup generators and battery systems, HVAC equipment, electrical infrastructure, and exterior facility areas. Although individual wash events may be relatively small in volume compared to cooling tower blowdown, they can introduce a range of pollutants into stormwater systems or directly into sanitary or industrial wastewater streams. These may include oils and greases, detergents, solvents, corrosion residues, metals, sediment, and residual treatment chemicals used in cooling or maintenance processes.

    One key permitting challenge is characterization and variability. The composition of equipment wash water can vary widely depending on maintenance practices, cleaning agents, frequency of washing, and whether equipment is exposed to outdoor conditions. Many cleaning products used in data center operations are proprietary or variable across contractors, making it difficult for permit writers to fully characterize pollutant loads or establish consistent effluent limitations.

    Another issue is regulatory classification. Depending on how wash water is collected and discharged, it may be subject to different regulatory pathways under the NPDES program, such as industrial wastewater discharge permits, stormwater general permits, or indirect discharge pretreatment requirements if routed to a POTW. This creates uncertainty for both operators and regulators in determining appropriate permitting requirements and compliance obligations.

- **Thermal Discharges:** Thermal discharges may implicate CWA Section 316(a), which allows variances from otherwise applicable temperature limits if the discharger can demonstrate protection of aquatic life.

- **Indirect Discharges and Pretreatment:** Indirect discharges to POTWs raise a different set of issues. Large data centers can impose significant hydraulic and pollutant loading on municipal treatment systems, potentially affecting treatment performance and compliance. Pretreatment programs may need to develop or revise local limits to address constituents associated with cooling water discharges, even where data on pollutant characteristics are limited.

  - "There is a large gap between the data center industry and wastewater systems, which are challenged by the pollutants emitted by data centers, the high-volume "slug loads" the centers often discharge and the industry's secrecy that can complicate regulatory compliance."

  - Chemicals discharged from data centers to WWTPs can include biocides -- such as azoles and glutaraldehyde -- to prevent bacterial growth, which can kill the microbes used in treatment. The slug loads discharged during startup are also harmful to the microbes.

- **Stormwater Permitting:** Data center facilities often involve extensive grading and impervious surface development, increasing the risk of sedimentation and runoff impacts. Post-construction stormwater management may also be relevant where industrial activities expose materials to precipitation.

- **Cumulative Impacts:** In regions experiencing rapid data center growth, multiple facilities may collectively contribute to thermal loading, increased salinity, or wastewater system constraints, even if individual permits appear protective in isolation.

- **PFAS:** Data centers primarily use PFAS to **cool their servers** and to suppress fires. Direct PFAS pollution from data centers is difficult to ascertain and likely limited because cooling systems generally run as closed loops. But manufacturing companies that produce the PFAS materials used in data centers have historically emitted PFAS, which harms communities and ecosystems near their facilities.

  Two-phase immersion cooling has become particularly popular for being cost effective and highly energy efficient. This technology, however, uses carbon and fluorine – the building blocks for several types of PFAS. These particular PFAS, furthermore, break down into trifluoroacetic acid – a toxic chemical linked to reproductive health risks.

- **Emerging Pollutants:** The original design approach for maintaining an efficient cooling system at a facility may require adjustment over time, as new products come to market. In particular, new biocides, anti-scaling chemicals, and corrosion inhibitors can introduce new pollutants to an effluent stream. These kinds of changes may also result in more frequent and more rigorous monitoring requirements.

- **Transparency / Trade Secrets**: Data center developers often aggressively shield information -- including ownership, water and energy use and other technology information -- from public view using NDAs, shell companies and other methods, fueling **broader concerns** about the industry's ability to maintain public trust.

- **TMDL Development and Implementation**

  - **Wasteload Allocations:** TMDLs require regulators to allocate limited assimilative capacity among competing sources. The introduction of new data center loads can create tension with existing dischargers, including municipal wastewater treatment plants and established industries. Policymakers must determine whether and how to accommodate new economic development within fixed pollutant budgets.

    Permits for data centers discharging directly to surface waters must incorporate WLAs established in applicable TMDLs. These limits may be more stringent than technology-based standards and can require advanced treatment, operational modifications, or alternative cooling approaches.

  - **Thermal TMDLs:** Cooling processes generate heat that is transferred to water and subsequently discharged. In waterbodies impaired for temperature, even small increases can exacerbate violations of water quality standards, particularly for sensitive aquatic species. Temperature TMDLs are common in western states and often leave little assimilative capacity for new or expanded discharges.

  - **Implementation and Reasonable Assurance:** Under the CWA, EPA and states generally must demonstrate reasonable assurance that nonpoint source controls and other implementation measures will achieve the pollutant reductions assumed in a TMDL. Rapid data center expansion can complicate these demonstrations because future water demands, wastewater characteristics, and cumulative impacts may be difficult to predict with precision. Where states rely on future reuse projects, conservation measures, or infrastructure upgrades to offset anticipated impacts, regulators may face questions regarding whether those measures are sufficiently enforceable, funded, and technically feasible to provide the required reasonable assurance.

    Reasonable assurance concerns are particularly acute where multiple data centers are planned within the same watershed; infrastructure expansion is occurring faster than watershed planning efforts; wastewater utilities lack capacity to manage increased hydraulic or pollutant loading; reduced return flows alter stream conditions relied upon in existing TMDLs; implementation depends on voluntary conservation or reuse practices; or\n- climate change and drought introduce additional uncertainty regarding future hydrologic conditions. States may also face pressure to demonstrate reasonable assurance that permit conditions, pretreatment requirements, cooling technology choices, and monitoring programs will adequately control cumulative impacts over time. In highly constrained watersheds, regulators may need to require advanced treatment technologies, alternative cooling approaches, phased development schedules, or expanded watershed monitoring programs to support defensible TMDL implementation strategies.

Finally, data center growth raises broader institutional and planning challenges for TMDL programs. Traditional TMDL frameworks were generally developed around more stable and predictable industrial and municipal discharge patterns. The rapid scale, geographic concentration, and evolving technologies associated with AI-related infrastructure development may strain existing watershed planning processes and require closer coordination among water quality agencies, water supply planners, energy regulators, local governments, and wastewater utilities. As a result, states may increasingly need to update implementation plans, revise WLAs, strengthen adaptive management provisions, and develop more integrated watershed-based approaches to ensure continued compliance with water quality standards in regions experiencing significant data center expansion.

- **Water Reuse**

  - **Source Water**: One of the most significant challenges associated with water reuse is the quality of the source water. Reclaimed water typically contains elevated levels of total dissolved solids (TDS), nutrients such as nitrogen and phosphorus, residual organic matter, and trace contaminants including pharmaceuticals and emerging chemicals of concern.

  - **Water Quality:** Water quality considerations are central to reuse applications. Reclaimed water may contain elevated levels of nutrients, salts, and trace organic compounds, which can affect cooling system performance and influence the composition of any resulting discharges. To maintain system efficiency, operators often rely on additional chemical treatment, including biocides, corrosion inhibitors, and anti-scaling compounds, which can alter the composition of resulting wastewater discharges.

    These reuse practices create important water quality concerns under the CWA. Existing state water quality standards and implementation procedures were generally developed around more traditional industrial or municipal discharges and may not fully address the unique characteristics of reuse-derived cooling water. Concentrated blowdown discharges may contain elevated salinity, nutrients, thermal loads, and emerging contaminants that can impair receiving waters or complicate compliance with narrative and numeric criteria. Temperature standards may also become relevant where cooling-related discharges contribute to thermal loading in already stressed watersheds.

  - **Reduced Flow Returns:** Water reuse can also affect broader watershed hydrology through reduced return flows. When reclaimed wastewater is diverted for consumptive cooling uses, less treated effluent may ultimately be returned to rivers, streams, or aquifers. In water-limited basins, these reduced flows can affect downstream water rights, instream flows, reservoir operations, aquatic habitat, and the assimilative capacity relied upon in water quality management programs. These impacts may be particularly important in arid western states where return flows are already heavily allocated and integrated into water supply planning assumptions.

- **Nutrients / Salts / Trace Organics:** Reclaimed water may contain elevated levels of nutrients, salts, and trace organic compounds, which can affect cooling system performance and influence the composition of any resulting discharges. Managing scaling, corrosion, and biological growth in reuse systems often requires additional chemical treatment, potentially introducing new constituents of concern.

- **State Variability:** Regulatory frameworks for water reuse vary significantly across states, creating uncertainty for data center developers and regulators alike. Coordination between CWA programs and Safe Drinking Water Act (SDWA) authorities is particularly important in cases involving indirect potable reuse or aquifer recharge.

  Some states maintain highly developed reclaimed water programs with detailed treatment standards, monitoring requirements, and reuse classifications, while others rely largely on case-by-case permitting decisions. This inconsistency creates uncertainty for both regulators and developers, particularly for multi-state operators attempting to deploy standardized cooling and reuse systems across different jurisdictions. Coordination between Clean Water Act programs, Safe Drinking Water Act authorities, water rights programs, and local utility requirements also varies substantially among states.

- **Regulatory Gaps:** Existing federal effluent limitation guidelines do not specifically address data center wastewater streams or reuse-based cooling systems. Many state permitting programs similarly lack data center-specific guidance regarding pretreatment, thermal discharges, reuse-derived pollutants, or emerging contaminants such as PFAS. Regulators and utilities also frequently cite insufficient transparency regarding water use, wastewater composition, and proprietary cooling technologies. As a result, federal and state agencies are increasingly considering new guidance, voluntary standards, monitoring requirements, and permitting frameworks specifically tailored to data center operations and water reuse practices.

- **Other CWA and Permitting Issues**

  - **CWA Sec. 401 Certification**: Certain data center energy infrastructure projects could require water quality certification from state regulators under CWA Section 401 (33 U.S.C. §1341). Any applicant for a federal license or permit to conduct any activity that may result in a discharge into navigable waters (i.e., waters of the United States) is required to provide the authorizing agency with a Section 401 certification. The certification—usually by the state in which the discharge originates, but sometimes by EPA—attests that the discharge will comply with applicable provisions of certain enumerated sections of the CWA.[82] Energy infrastructure projects that typically require Section 401 certifications include hydropower projects licensed by FERC and pipeline projects involving the discharge of dredged or fill material into waters of the United States.

  - **CWA Sec. 404 Permitting**: Any discharge of dredge or fill material into waters of the United States associated with data center energy infrastructure projects would also require a CWA Section 404 permit (33 U.S.C. §1344). In most states, the Corps issues these permits, but two states—Michigan and New Jersey—are authorized to administer their own Section 404 permits in certain waters. These permits may be required if the development of a site involves discharges of dredged or fill material into wetlands or other waters of the United States, or if energy infrastructure projects require placement of fill at water crossings, for example.

- **Climate**: Climate change may intensify and be influenced by the rapid expansion of data centers, creating new challenges for CWA implementation. Rising air and water temperatures, prolonged droughts, reduced streamflows, and more frequent extreme weather events can diminish the assimilative capacity of receiving waters, complicate compliance with water quality standards, and increase the likelihood of permit limitations for thermal and conventional pollutant discharges. At the same time, the growing demand for electricity to power data centers may increase greenhouse gas emissions in regions that continue to rely on fossil fuel generation, while associated power plants, transmission infrastructure, and cooling systems can create additional water quality and permitting considerations. State regulators are increasingly challenged to account for changing baseline hydrologic conditions, cumulative watershed impacts, and the interaction between climate resilience, water resource management, and CWA program implementation. These considerations underscore the need for greater coordination among water quality standards, impaired waters, permitting, and broader state climate adaptation and water resource planning efforts.

- **Energy-Water Nexus**: Data center expansion highlights the increasingly important energy-water nexus, as reliable electricity generation and water availability are closely interconnected. Data centers require substantial electrical capacity to support high-density computing, while many forms of electricity generation—including thermoelectric, nuclear, and some renewable energy technologies—depend on significant water withdrawals or consumption for cooling. The construction of new power plants, transmission infrastructure, and associated facilities may trigger additional Clean Water Act permitting and review requirements, including those related to water quality standards, NPDES permitting, dredge and fill activities, and Section 401 water quality certification. At the same time, growing competition for limited water resources among energy production, public water supplies, agriculture, and ecological needs may influence permitting decisions, watershed planning, and water quality management. These interconnected challenges reinforce the need for integrated planning across energy, water resource, and Clean Water Act programs to ensure that both electrical reliability and water quality objectives can be achieved as data center development accelerates.

- **Environmental Justice**: Large data center campuses may increase demands on local water supplies, wastewater infrastructure, energy systems, and transportation networks, while associated power generation and industrial development can contribute to cumulative environmental impacts in nearby communities. Although many data centers generate relatively limited direct emissions, CWA implementation may involve evaluating the cumulative effects of water withdrawals, wastewater discharges, stormwater management, and related infrastructure projects on communities that already face disproportionate environmental or public health burdens. State regulators are increasingly asked to consider how facility siting, watershed-scale impacts, public participation, and cumulative environmental conditions intersect with Clean Water Act permitting and water quality protection. As data center development continues to expand, integrating environmental justice considerations into watershed planning, permitting decisions, and stakeholder engagement may help improve transparency, build public trust, and support more equitable water resource management.

- **Public Concern / Backlash**
    - Concerns about data centers' discharges, rising energy usage and other factors are fueling growing public distrust and making it difficult for states to set water regulations, state environmental commissioners said this week. Likewise, there are many questions being raised regarding a data centers carbon footprint.
    - In several communities nationwide, there has been growing public opposition to proposed data center development and expansion, citing concerns about aquifer drawdown, rising wastewater loads, or the climate implications of pairing water-hungry cooling with fossil-heavy power. Advocacy groups have called for moratoria on new data centers in certain regions until there was clearer accounting of impacts. State legislators floated bills requiring site-level water use disclosure. In at least one case, a high-profile transparency bill advanced to a governor's desk before being vetoed over industry concerns.

Conclusion

The rapid expansion of data center infrastructure presents state clean water regulators with a complex and evolving set of challenges across multiple Clean Water Act (CWA) programs. Modern data centers combine intensive water demands, large wastewater flows, advanced cooling technologies, and significant energy requirements in ways that do not fit neatly within traditional industrial permitting and water quality frameworks. As a result, states are increasingly being asked to apply existing CWA authorities to issues involving consumptive water use, thermal and chemical discharges, water reuse, pretreatment, groundwater protection, and cumulative watershed impacts. The issues discussed in this memorandum demonstrate that data center regulation extends well beyond traditional wastewater permitting. Rapid facility growth is raising broader concerns regarding water supply reliability, wastewater treatment capacity, impaired waters, reduced return flows, emerging contaminants such as PFAS, and long-term watershed planning. These challenges are especially significant in water-limited regions or watersheds already subject to TMDLs, nutrient controls, or thermal impairments. At the same time, growing public concern regarding transparency, environmental justice, and the cumulative impacts of clustered development is placing additional pressure on state agencies. Significant regulatory uncertainty also remains.

Existing federal effluent limitation guidelines do not specifically address most data center wastewater streams, state reuse frameworks vary widely, and limited data exist regarding the composition and impacts of many cooling system discharges. Regulators may increasingly need to develop sector-specific permitting approaches, strengthen monitoring and disclosure requirements, revise pretreatment and reuse standards, and improve coordination among water quality, water supply, and energy planning programs. Ultimately, data centers present both an economic development opportunity and a long-term water management challenge. As artificial intelligence and digital infrastructure continue to expand, state clean water regulators will play a central role in determining whether this growth can occur in a manner consistent with water quality protection, watershed resilience, and sustainable resource management.