VIRGINIA DATA CENTER REPORTS

A LINE DRAWN ON A HIGHWAY

Virginia's Groundwater Boundary, the Rivers Beyond It, and the Data Center Load the Regime Does Not Reach

Tommy N. Turner

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Executive Summary

Key points

Virginia counts its water everywhere and allocates it almost nowhere. Any withdrawal above ten thousand gallons a day must be reported to the Commonwealth annually, wherever it occurs. What the Commonwealth does not do is condition authorization on quantity, because its permitting programs ask categorical questions instead. There are three of them, they operate independently, and a data center in western Virginia answers all three in the way that exempts it.

Territorial. The groundwater program asks where you are. Inside two declared management areas it regulates by quantity and rigorously. Outside them it does not regulate at all, at any volume. The declared area is defined in part by Interstate 95.

Temporal. The surface water program asks when you started. A withdrawal in existence on July 1, 1989 needs no permit, and the information a grandfathered operator files "shall not constitute a limit."[1] Neither of Fairfax Water's two raw water intakes, Corbalis on the Potomac and Griffith on the Occoquan, holds a withdrawal permit, on the corpus and date set out at Section 8.2. Statewide, 78 percent of reported non-power withdrawals are unpermitted.

Definitional. The reporting regulation asks whether you took the water from an original source. "The purchase of water from a waterworks by a customer of it does not constitute a withdrawal."[2] Place and vintage exempt the utility. This one exempts the data center, regardless of either.

Roughly ninety percent of Virginia's inventoried data center facilities sit outside every declared groundwater management area. This is a facility count. This volume holds no megawatt data and makes no claim about capacity. Of 286 inventoried facilities, 257 are outside, or 89.9 percent. Restricting to operating facilities raises it to 95.8 percent, and to facilities with exact coordinates, 97.5 percent. Twenty-one facilities in split counties sit within three kilometers of Interstate 95, close enough that the classification turns on the centerline rather than on any hydrogeologic fact; counting all of them inside gives 84.6 percent outside, and counting all of them outside gives 92.0 percent. **The defensible statement is 84.6 to 92.0 percent, best estimate 89.9.**[3]

The boundary is a road, and the Commonwealth publishes no alternative. 9VAC25-600-20(A) draws the line at Interstate 95 for eight counties. The geologic feature the road stands in for, the contact between the Coastal Plain sediments and the crystalline basement, is not published as a line feature by any Virginia agency and has to be derived. Derived from the state geologic map, it resolves into a braided zone of outliers tens of kilometers wide through the Fredericksburg corridor, which Interstate 95 crosses at least six times. **The two are not the same line, and in the counties that matter most the divergence is greatest.**

Every one of Loudoun County's 121 inventoried facilities lies north of where Interstate 95 leaves Virginia. The county holding 42 percent of the inventory sits beyond the end of the line the regulation uses to divide the state.

The load is on surface water, and it reaches the aquifer anyway. Northern Virginia data centers buy finished water from Loudoun Water, Fairfax Water and Prince William Water. Fairfax

Water's two intakes on the Potomac and the Occoquan, which supply its own customers and most of what the other two utilities sell, operate under the pre-1989 exclusion; Loudoun Water's own Potomac intake, permitted by DEQ in 2012, is the exception. That is the temporal category. Separately, Caroline and King George draw their public supply entirely from the confined Potomac aquifer, verified permit by permit and screen depth by screen depth. Every gallon a data center buys from those counties is aquifer water, permitted and metered inside a declared management area, and attributed in the record to a county utility. **No permit search in an operator's name will find it.** That is the definitional category, and it is the path by which the load reaches the aquifer while remaining invisible.

The Commonwealth's one quantitative estimate says the aquifer at the western margin is close to committed. DEQ's SJ 25 study returns a maximum passing withdrawal of 60,000 gallons per day at the Caroline centroid, one of three centroids in the study that fall at or below that figure and the lowest of those that could be resolved to a number, against DEQ's own hyperscale benchmark of roughly 300,000 gallons per day per 100 megawatts. North of Stafford the model does not reach.

Caroline's answer was to leave the aquifer. DEQ issued a Rappahannock withdrawal permit on November 26, 2025, for an intake reached by roughly thirty-five miles of pipe across a watershed divide. The permit caps withdrawal at 9.0 million gallons per day against physical works engineered and modeled at 13.9, and actual withdrawal is zero because nothing is built. Industrial cooling was removed from the application in December 2024 and then excluded by express term. The permit runs fifteen years, cannot be extended, and curtails to 7.0 and then 6.0 million gallons per day on declared drought. **It is the only enforceable quantitative ceiling anywhere in the corridor, and the county obtained it by crossing a watershed divide.** DEQ has separately directed King George to move its own public supply off the Potomac aquifer and onto the Rappahannock.[4]

Where the exemptions bite hardest is on households. Fauquier County is the only county in this volume drawing public supply from fractured bedrock, and it lies entirely outside any declared area. Its largest single category of groundwater use is private domestic self-supply, which USGS estimated at 2.51 million gallons per day for 2015 against 1.76 for county-wide public supply, a broader universe than the county Authority's own systems, which reported 1.64 for fiscal 2025. Those users have no permit, no utility, and no regulator, and the county states in its own drought plan that Virginia gives counties little latitude to manage private wells. Mandatory restrictions have been in force since June 5, 2026.[5] The county reported on August 6, 2026 that groundwater levels "remain in the Emergency status," and on July 29 the health district waived replacement well fees and suspended the requirement that dry wells be abandoned. **One continuous water level recorder is still reporting in the county, and none at all in its Culpeper Basin portion.**

Decision rules in this corridor turn on numbers the public does not have. Fauquier's drought triggers are set as percentages of permitted capacity, and no system-wide permitted or rated capacity figure is published by the authority. DEQ has published no volume limit, issuance date, expiration date or permittee of record for the surface water permit under which a King

George data center takes its cooling water. In both cases the instrument exists and the quantity does not.

What this volume does not establish

It does not quantify western groundwater use. The annual withdrawal report dataset that could do so was not obtained, and the state dashboard's row-level facility table sits behind a terms-of-use agreement that was not accepted.

It does not infer behavior from missing permits. No groundwater permit can exist for a data center in Loudoun, Fauquier, Culpeper or western Prince William, so the absence of permits there carries no information. Any analysis reasoning from "no permits on file" to "no groundwater use" in those counties is invalid.

It makes no recommendations. It reports what the instruments say and what they do not measure.

Its negative findings are scoped to named corpora and dates throughout. Where a figure could not be verified against a primary source, it is labeled as press, as an author's calculation, or as unverified.

What to watch

DEQ's paragraph N report on whether a groundwater management area should be established for western Loudoun and Fauquier, due December 31, 2026. The Cooling Water Scarcity Area rulemaking, due July 1, 2027, exempted from the Administrative Process Act, and not yet started. The customer-category reporting duty that attaches January 1, 2027. The King George groundwater permit decision. The Fauquier zoning text amendment initiated August 20, 2026, which reopens a definition on which the county's only data center water control depends. And a ruling in *Cross v. Town of Warrenton*, argued June 15, 2026, on which the last approved data center in a town that has since banned the use is waiting.

This volume is a companion to Two Systems, One Drought, *not a sequel, and is written to be read alone. Where the two overlap, they overlap by design.*

1. Purpose, Scope, and Relationship to the Eastern Volume

This volume examines how Virginia regulates water withdrawal in the part of the Commonwealth lying west and north of the Fall Line: the Piedmont, the Blue Ridge, the Valley and Ridge, the Cumberland Plateau, and the Northern Virginia crescent running from Fairfax through Loudoun and Prince William into Fauquier. It is a companion to *Two Systems, One Drought*, which examined the groundwater management regime east of Interstate 95.[6] It is not a revision of that volume and does not assume the reader has read it.

Virginia counts its water everywhere and allocates it almost nowhere. Every user withdrawing more than ten thousand gallons a day in any month files an annual report, statewide, with no geographic qualifier.[7] That reporting duty is why the Department can state that unpermitted withdrawals were approximately 78 percent of the Commonwealth's total reported withdrawals excluding power generation in 2024, and 81 percent of reported surface water withdrawals.[8]

What the Commonwealth does not do is condition authorization on quantity, and the reason is that its two permitting programs ask categorical questions instead.

The groundwater program asks where you are. Inside two declared management areas, a withdrawal of 300,000 gallons in a month requires a permit authorizing "a specific amount," an evaluation of need and alternatives, an estimate of the area of impact, a conservation plan, and a term of not more than fifteen years. Outside them the statute excludes "the withdrawal of ground water in any area not declared a ground water management area," with no volume qualifier, no use qualifier and no aquifer qualifier.[9] Inside the declared areas Virginia does regulate groundwater by quantity, and rigorously. Outside them it does not regulate it at all.

The surface water program asks when you started. A withdrawal in existence on July 1, 1989 requires no Virginia Water Protection permit, and the regulation provides that capacity information supplied to the Department "shall not constitute a limit on the exempted withdrawal."[1] That exemption is not absolute. A permit is required if a new federal certification is needed to increase a withdrawal, and the Department retains a residual authority to order a grandfathered user to cease and apply if impairment occurs.[10] But no volume is fixed, and the Department has never invoked the residual authority against a public water supply so far as this research established.

Neither program conditions a withdrawal on how much water is there. One asks a question about place. The other asks a question about vintage. Both admit of an answer that ends the inquiry.

The third category, and the one that governs this load

Place and vintage exempt the *utility*. A third mechanism exempts the *data center*, and it operates regardless of either.

The reporting regulation defines the regulated person as one "making a withdrawal ... from an original source," and provides that "the purchase of water from a waterworks by a customer of it

does not constitute a withdrawal."[2] A facility buying finished water from Loudoun Water, Fairfax Water or Prince William Water is a customer of a waterworks. It has no registration duty, no metering duty and no reporting duty. Its water enters the state record once, as raw intake attributed to the utility, coded as public water supply, located at the withdrawal point rather than the point of use.

Section 5 sets out what follows. The most important consequence is stated there and repeated here because the rest of the volume depends on it: **the absence of a permit in a data center's name carries no information about what that data center uses.** No argument in this volume reasons from an empty permit register to an empty aquifer.

Where the load actually sits, measured

The load is on surface water. Loudoun, Fairfax and western Prince William buy Potomac River and Occoquan Reservoir water at retail from three utilities whose intakes predate 1989.

Its position relative to the declared boundary can be computed rather than asserted. Of the 286 geolocated facilities in this project's statewide inventory, **29 sit inside a declared groundwater management area and 257 sit outside**, or 89.9 percent. Restricted to facilities operating or under construction, 15 inside against 212 outside. Restricted to operating facilities alone, 8 against 182. Restricted to those recorded with exact rather than approximate coordinates, 4 against 154.[11]

Twenty-one facilities in the eight counties the regulation splits sit within three kilometers of the interstate, close enough that their classification turns on the position of a road centerline rather than on anything hydrogeologic. Counting every one of them inside gives 84.6 percent outside; counting every one outside gives 92.0 percent. **The defensible statement is that between 84.6 and 92.0 percent of inventoried facilities sit outside every declared area, and the best estimate is 89.9.** The inventory holds 286 named facilities against a summary count of 450 or more in Loudoun alone, and because the undercount falls in a county entirely outside every declared area, the reported outside share is a floor.

In the northern crescent the margin is not close, and no marginal case arises there at all. Every one of the 210 facilities in Loudoun, Prince William, Fairfax, Fauquier and Culpeper lies west of Interstate 95 or north of the point at which the highway leaves Virginia. The nearest of them sits 12.7 kilometers from the road, in Fairfax; in Prince William the nearest is 20.7, in Fauquier 24.8, in Loudoun 30.8 and in Culpeper 45.4. **Within the northern crescent the boundary would have to be misplaced by nearly eight miles to move a single facility.** Every facility close enough to the line for its precise location to matter is in the Richmond metropolitan area.[12]

And all 121 of Loudoun's facilities lie north of latitude 38.79, where Interstate 95 leaves Virginia. The county holding 42 percent of the inventory sits beyond the northern end of the line the regulation uses to divide the state. Figure 1 plots the inventory against the declared areas.

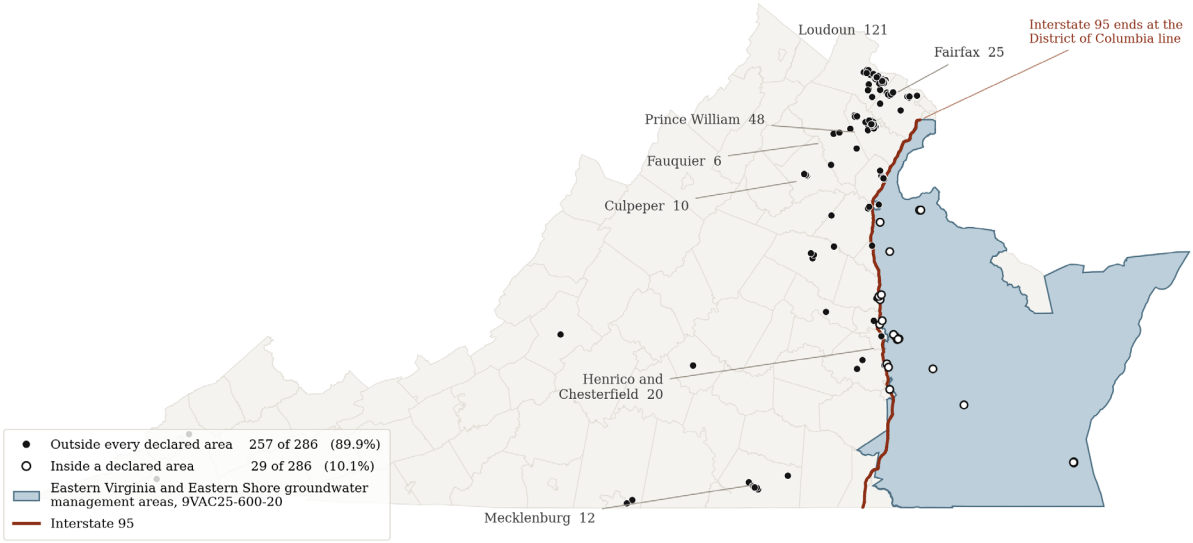


Figure 1. Virginia's 286 inventoried data center facilities against the declared groundwater management areas of 9VAC25-600-20. 257 of 286, or 89.9 percent, lie outside every declared area. Interstate 95 is drawn to its full Virginia extent; it ends at the District of Columbia line, north of which no facility can be east or west of it. Sources and marginal-case sensitivity at the note to this passage.

A caution the volume carries throughout. The Fall Line is a geological contact. Interstate 95 is a highway. They are not the same line, they cross at least six times through Stafford and Spotsylvania, and at the latitude of the interstate's own Centreport Parkway interchange the contact runs through the industrial park itself, which is mapped 71 percent Coastal Plain sediment and 29 percent crystalline basement.[13] No Virginia agency publishes the Fall Line as a line feature; the version used here is derived from the state geologic map and Section 17 states its precision. This volume uses the Fall Line when describing what the rock does and Interstate 95 when describing what the Commonwealth regulates, and never treats them as interchangeable.

Where the aquifer is reached

The Coastal Plain aquifer is reached in three ways. Two of them are invisible to a permit search conducted in an operator's name.

One data center appears as an applicant on a Virginia groundwater withdrawal permit. Amazon's Birchwood campus in King George County holds draft permit GWI000502 in the confined Potomac aquifer, authorizing 6,400,000 gallons per year and 640,000 gallons per month. **Author's calculation:** the annual figure averages 17,534 gallons per day. The Department attributes an estimated ninety percent of it to human consumptive use, a share it derives as thirty-five gallons per employee per day across 450 employees. Cooling at that campus is to come from the Rappahannock under a separate surface water permit whose holder of record, so far as this research located any transfer instrument, remains the decommissioned power plant that preceded the campus.[14]

That is the only such applicant located in Virginia Permit Transparency as of August 23, 2026. Section 5.5 states the limit on that finding: the register tracks applications inside the Department's current workflow, so a permit issued earlier and never modified would not appear in it.

The second contact is larger and appears in no register at all. The public water supply of Caroline County and King George County is drawn from the confined Potomac aquifer, at screen depths between 170 and 300 feet in the four county and investor-owned permits this research examined.[15] A data center buying finished water from either county is buying Potomac aquifer water, recorded by the Commonwealth against the utility rather than the customer.

The third is displacement, and Section 8a sets it out. In July 2026 the Department published the only computation it has ever made of what the Coastal Plain resource can support at named locations: a maximum-passing withdrawal at each of nine sites, tested against a calibrated model and an eighty percent drawdown criterion. None of the nine passed at three million gallons per day. Caroline County's centroid returned 60,000 gallons per day.[16]

Caroline is therefore building toward a Rappahannock intake instead. **What it is moving into is not an unregulated instrument.** The surface permit carries a daily maximum, an annual cap, a fifteen-year term and no extension.[17] The movement documented here is from an aquifer that has been measured and found insufficient onto a river that is separately capped, in the same corridor, under a different program.

That is the finding, and it runs opposite to the hypothesis the eastern volume records from a hearing witness, that surface water stress will push users toward groundwater. Section 14.8 keeps that hypothesis, attributed to him and marked as untested. The movement this volume can document runs the other way.

What this volume covers

The statutory and regulatory architecture of water withdrawal outside a declared groundwater management area, and the definition that conceals its breaches. The physical behavior of the aquifers that architecture does not reach, which matters because the categories were drafted for a porous medium and one county in this study, Fauquier, whose Authority reported 1.64 million gallons a day across sixteen systems in fiscal 2025 against 1.29 derived from the same report, actually draws its public supply from fractured bedrock, and Section 8.4.1 reconciles that pair against the three county-wide figures that also circulate. The source of supply for data center cooling load in Loudoun, Prince William and Fauquier. The Interstate 95 corridor counties where the Coastal Plain thins and the displacement is underway. The 2026 legislative session, including a cooling mandate that the Governor materially rewrote in the four days between enrollment and signature, and a scarcity-area rulemaking due July 1, 2027 that has not been started. Consumptive use, which is the quantity no program measures under either category. The dormant surface water allocation authority in Chapter 24 of Title 62.1 and the three proceedings opened under it in 1993. The hydrologic record of water year 2026. And the regional water supply plans due in October 2029, under a regulation providing that "additional studies shall not be required."

What this volume does not cover

Loudoun County's land use history, its by-right entitlement, its ordinance amendments and its board proceedings belong to a separate case study. So do Botetourt County's recruitment of the Google campus, its non-disclosure agreement, and the litigation over its water figures. The governance, fiscal and land-use record of the Fredericksburg Ring counties belongs to the volume

of that name; what is taken here is the hydrogeology and the displacement finding. The Department's SJ 25 study and its eastern implications belong to *The Aquifer Says No*; what is taken here is the western gradient in its results, the limit of its model domain, and the Caroline figure.

Utilities appear here as utilities, through rate schedules, capital documents, service agreements and published figures, rather than as instruments of county policy.

A note on the west's two halves

The load is not evenly distributed. Summary counts for the northern crescent run to more than 450 known data centers in Loudoun, 65 or more in Fairfax and 120 or more in Prince William; the named-facility inventory used for the computation above resolves 121, 25 and 48 of them respectively, which is the undercount noted there.[18] West of the Blue Ridge the inventory counts three: one operating in Wise, one in Scott, and one proposed in Botetourt.[19]

The argument that follows is therefore about the northern crescent, the Piedmont and the Interstate 95 corridor. Southwest Virginia and the Roanoke Valley appear where the statewide hydrologic record requires it, which in water year 2026 is frequently.

Evidence standard

Load-bearing claims rest on primary sources: the Code of Virginia, the Virginia Administrative Code, the *Virginia Register of Regulations*, enacted appropriation act text, Department reports and permit records, United States Geological Survey publications, utility financial and rate documents, and locality planning records. Press is cited only where it carries a quotation or figure not otherwise available, and is labeled as press at the point of citation. Where a figure originates in testimony rather than a document, the citation gives the proceeding and the time and notes whether a second speaker confirmed it. Figures computed by the author are labeled as such.

Negative findings name the corpus searched and the date searched. This volume does not assert that a record does not exist; it asserts that a record is not present in a named body of material as of a stated date, which is a different and smaller claim. Section 16 records the failure mode of that discipline, which is that a negative is only as good as the boundary of the thing searched, and the person who drew the boundary is least likely to notice it is drawn in the wrong place.

Versioning

The Department's study of groundwater in western Loudoun and Fauquier counties is due to the chairs of the two natural resources committees by December 31, 2026, and Section 7 establishes the condition that study was in as of August 20, 2026. A second study, funded at $300,000 and $200,000 across two fiscal years and frequently described as a western study, is not one: the enacted text confines it to aquifer recharge "at wastewater treatment facilities in the Eastern Virginia Groundwater Management Area."[20]

Waiting for either would mean publishing after the questions they address have been framed by someone else. This volume states its case now and will be versioned as each lands.

2. The Line Is an Interstate

Virginia has declared two groundwater management areas. Both are east. Neither was drawn on a geological contact.

The declarations appear in a two-section chapter of the Virginia Administrative Code titled "Designated Groundwater Management Areas." The operative text reads:

> "A. The board hereby orders the declaration of the eastern part of Virginia as a groundwater management area. This area shall be known as the Eastern Virginia Groundwater Management Area. This area encompasses the counties of Charles City, Essex, Gloucester, Isle of Wight, James City, King George, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northumberland, Prince George, Richmond, Southampton, Surry, Sussex, Westmoreland, and York; the areas of Caroline, Chesterfield, Fairfax, Hanover, Henrico, Prince William, Spotsylvania, and Stafford counties east of Interstate 95; and the cities of Chesapeake, Franklin, Hampton, Hopewell, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg.
>
> B. The board hereby orders the declaration of the Eastern Shore of Virginia as a groundwater management area. This area shall be known as the Eastern Shore Groundwater Management Area. The area encompasses the counties of Accomack and Northampton.
>
> C. All aquifers located between the land surface and basement rock within the geographic area defined will be included in the area and will be subject to the corrective controls set forth in the Act."[21]

That is the entire inventory: twenty whole counties, the east-of-Interstate-95 portions of eight counties, and eleven cities in the Eastern Virginia area, plus two counties on the Eastern Shore. The Department of Environmental Quality states the same count in its own words on its groundwater withdrawal program page.[22] No third groundwater management area is present in Chapter 25 of Title 9 of the Virginia Administrative Code as of August 23, 2026; the full agency chapter list was retrieved and reviewed, and the only other chapter that ever declared one, 9VAC25-620, is captioned as repealed.[23]

Loudoun County does not appear in the regulation. Not in whole, not in part, not by reference to any boundary. Fauquier and Culpeper likewise do not appear. Fairfax and Prince William appear only as to their portions east of Interstate 95, which excludes the Route 28 and Dulles corridor entirely and excludes the data center overlay district near Manassas and Gainesville entirely.

2.1 The chronology, and what it shows about the boundary

The Eastern Shore designation is the older of the two. It took effect November 1, 1976 under the Ground Water Act of 1973, as an order declaring Accomack and Northampton counties a critical ground water area.[24] The Eastern Virginia area followed on December 6, 1989.[25] As originally declared, the eastern area covered ten whole counties, the east-of-Interstate-95 portions of Chesterfield, Hanover, and Henrico, and eleven cities.[26]

Two actions in 2013 and 2014 produced the boundary now in force. A fast-track action effective October 10, 2013 folded the Eastern Shore into the same chapter, retitled it to reflect multiple designated areas, and repealed the older chapter.[27] A final regulation effective January 1, 2014 expanded the Eastern Virginia area, adding ten counties in whole and adding "those portions of the counties of Arlington, Caroline, Fairfax, Prince William, Spotsylvania, and Stafford that are located east of Interstate 95."[28]

Arlington did not stay on the list. On June 4, 2014 the State Water Control Board removed it through a technical amendment exempt from the Administrative Process Act. The filing states the reason in full:

> "This regulatory action removes Arlington County from the list of counties east of Interstate 95 that are included in the Eastern Virginia Groundwater Management Area. Arlington County is located entirely west of Interstate 95 and was inadvertently listed in the regulation as being partially in the Eastern Virginia Groundwater Management Area."[29]

No hydrogeologic reasoning appears in the filing. Arlington was removed because of where it sits relative to a highway. That is the clearest available evidence of what the regulated boundary actually is.

2.2 The legal boundary and the physiographic one are different objects

The Fall Line is the contact between the crystalline rocks of the Piedmont and the unconsolidated sediments of the Coastal Plain. It runs roughly from Alexandria through Fredericksburg, Richmond, Petersburg, and Emporia. Interstate 95 runs roughly parallel to it and, for much of its length, close to it. The two are not the same line, and the divergence is largest in exactly the counties that matter most to this volume.

The practical consequence is that eight Virginia counties are split by the regulation. In Caroline, Chesterfield, Fairfax, Hanover, Henrico, Prince William, Spotsylvania, and Stafford, a withdrawal on one side of the interstate requires a permit and a withdrawal on the other side does not, regardless of which aquifer is being pumped and regardless of whether the two wells are a mile apart.

Subsection C of the declaration compounds this. Inside a declared area the regulation reaches "all aquifers located between the land surface and basement rock," which in the Coastal Plain means the entire sedimentary wedge.[30] No provision reaching crystalline basement rock west of the line is present in 9VAC25-600, 9VAC25-610, 9VAC25-200 or 9VAC25-220 as of August 25, 2026, the four chapters that together constitute the Board's withdrawal authority. The regulated column is defined by depth to basement inside the area and is undefined outside it.

The agency says the same thing, in the report this volume relies on. The SJ 25 study opens by explaining its own western boundary. The Coastal Plain runs eastward from the Fall Zone, and "the I-95 corridor runs along the east side of the Fall Zone, so that a strip of VCP sediments lies between" the two. What the report does with that strip is stated plainly: "For the purposes of the SJ 25 groundwater study and report, this strip is disregarded, and I-95 is treated as the approximate western edge of the VCP aquifer system."[31]

It says the same of the management area, and maps it. "Similarly, I-95 generally defines the western edge of the Eastern Virginia GWMA ... The Eastern Virginia GWMA includes a few small areas west of I-95 and excludes a few small areas east of I-95." Figure 2 stripes the portions of the Coastal Plain that lie outside the management area, and carries the geology, the physiographic boundaries, the administrative boundaries, both management areas and the model domains on a single sheet. Whether the striped set also depicts the western strip the report disregards is not stated, and the figure is captioned as a map of the study area east of Interstate 95.[32]

Then it sets them aside. "These minor divergences between physiographic, administrative, and regulatory boundaries are noted for clarity but do not appreciably affect the results of the analyses."[32]

That sentence is correct, and it reaches a smaller territory than it appears to. DEQ's analyses simulate aquifer behavior: drawdown, critical cells, maximum passing withdrawals. For those questions a few square miles of sediment on the wrong side of a highway do not change the answer, because the model runs on hydrogeology and not on jurisdiction. The sentence says nothing about which withdrawals require a permit, and it should not be read to, because the report was never asked that question.

Two findings follow from the mismatch, and they are different sizes. The narrow one is the strip itself. There the divergence leaves DEQ's simulations undisturbed and changes the permit obligation completely. A well in Coastal Plain sediment west of the interstate draws from the same wedge as one east of it and needs no permit at any volume. Section 8a.1 sets out the clearest instance of the divergence itself, an industrial park at Centreport Parkway through which the mapped contact runs, 71 percent Potomac Formation and 29 percent gneiss. This volume does not establish that any well there is on the unregulated side of the road, and does not need to; the park is evidence that the two lines part company where the load is, not evidence of a permit that was avoided.

The broad finding is not about that strip at all. Most of the load counted in this volume sits in Loudoun, Prince William and Fairfax, in the Piedmont, on crystalline and Triassic basin rock rather than Coastal Plain sediment on either side of the interstate. Section 6 establishes that this is a different aquifer system with different storage and a different failure mode, and that across most of it there is no laterally continuous confined head surface of the eastern kind to measure against. Section 6.2 sets out the exception, the Culpeper Basin, which runs through three of those counties and does carry confining units. **This volume does not offer DEQ's "few small areas" as evidence for that finding, and does not need to.** The Piedmont is the province next door, and the SJ 25 report does not discuss it.

On the narrow finding, DEQ has measured the aquifer's response rate once, and where it measured it matters. Presenting to the Eastern Virginia Groundwater Management Advisory Committee in June 2025, the Department's Groundwater Monitoring and Characterization Program Manager set out a case study of the 2010 Franklin Mill shutdown, plotting the elapsed days before water levels began to rise in each observation well against that well's distance from the mill. The relationship, taken with groundwater-level contour mapping

and corroborated by flow modelling, gives a response rate of **approximately 70 miles per year**.[33]

Two limits belong on that figure before it is used. It was measured in the thick, down-dip confined Potomac around Franklin, roughly a hundred miles from the corridor this section is about. At the updip margin the aquifer thins toward the Fall Zone, and Section 7.4 quotes DEQ's own account of that ground: the area north of Stafford is "somewhat isolated from the rest of the VCP aquifer system" and "incompletely characterized." No comparable response rate has been measured at the margin, and this volume does not transfer the Franklin figure to it. The presentation itself was not obtained; the note cites the committee's summary of it.

What the figure does support is narrower and still sufficient. Where two wells are completed in the same Coastal Plain unit on opposite sides of Interstate 95, the Commonwealth's own evidence is that the unit transmits pressure between them. How quickly is not established at the margin, and the Franklin figure will not supply it: a confined pressure response is diffusive, so travel time scales roughly with the square of distance and a rate observed across tens of miles cannot be divided down to one. What the record does not contain anywhere is a reason the aquifer should stop at a highway. One of those two wells is regulated.

And DEQ describes the boundary the way this section does, in a report to the legislature. The committee's 2025 annual report, submitted to the Governor, the General Assembly and the State Water Commission, states that "[t]he Eastern Virginia Groundwater Management Area includes all of the Commonwealth east of Interstate 95, except for the Eastern Shore, which is a separate groundwater management area."[34] That is the agency's own shorthand for its own management area. The declaration quoted at the head of this section is a list of localities; the shorthand is a highway.

Author's note on framing. This volume uses the Fall Line as its geographic frame because the Fall Line is what governs the physics discussed in Sections 6 and 7. It uses Interstate 95 whenever it describes what the Commonwealth actually regulates. Readers should not treat the two as interchangeable, and the volume does not.

2.3 The agency head draws the same line, unprompted

On August 20, 2026 the Director of the Department of Environmental Quality appeared before the Virginia State Water Commission to present the SJ 25 groundwater study. Delegate Hodges asked him whether the Potomac aquifer extends into Northern Virginia, and specifically whether reinjection of the kind practiced at Hampton Roads could work "somewhere around in Loudoun in that area." The exchange:

> **Rolband:** "This aquifer goes up basically along I-95 and and to the east of it. So it's in just that piece of Fairfax. And the Loudoun County is in a different geologic area in the Piedmont."
>
> **Hodges:** "But, but the rocks and."
>
> **Rolband:** "That's rock."
>
> **Hodges:** "Versus sediment."[35]

That is the distinction this volume is built on, stated by the agency that administers the regime, in answer to a question it did not plant, four minutes into a discussion of something else. Sections 6 and 7 give the physics behind it. Sections 3 through 5 give the regulatory consequence.

The same exchange contains a second thing worth marking. Ninety seconds earlier, a commission member had described a 2026 appropriation of $1.15 million as money "to establish the groundwater monitoring stations in Northern Virginia," adding "And there are none. And that's one of the biggest problems." The Director assented: "Yeah."[36] The enacted appropriation reads differently. Item 366, paragraph Q of the 2026 budget provides the $1,150,000 for "up to five additional multi-well research stations to gather additional data to study the upper portions of the Eastern Virginia Groundwater Management Area."[37] Section 7 takes up what that means. For present purposes the point is narrower: in a single exchange, "Northern Virginia" is used to mean the upper end of the managed Coastal Plain, and then, ninety seconds later, is distinguished from Loudoun on the ground that one is sediment and the other is rock. Both usages are ordinary. Read together they are the reason this volume insists on naming which line it means.

3. The Categorical Exclusion

Outside a declared groundwater management area, Virginia issues no groundwater withdrawal permit. The exclusion is categorical. It carries no volume threshold, no use restriction, and no aquifer qualification.

Three primary texts establish it independently.

The statute lists ten exclusions from the permit requirement. The first and the ninth are the relevant ones:

> "No ground water withdrawal permit shall be required for (i) withdrawals of less than 300,000 gallons a month; ... (ix) the withdrawal of ground water in any area not declared a ground water management area; or (x) the withdrawal of ground water pursuant to a special exception issued by the Board."[38]

The implementing regulation carries an eleven-item list of its own, of which the first and ninth match: "The following do not require a groundwater withdrawal permit: 1. Withdrawals of less than 300,000 gallons per month; ... 9. Withdrawals in any area not declared to be a groundwater management area." The two lists are not coextensive. Both carry a special-exception item, at § 62.1-259(x) and 9VAC25-610-50(10); the regulation alone adds an eleventh item for free-flowing springs.[39]

The prohibition those exclusions carve out of is itself territorial. The regulation reads: "No person shall withdraw, attempt to withdraw, or allow the withdrawal of groundwater within a groundwater management area, except as authorized pursuant to a groundwater withdrawal permit, or as excluded in 9VAC25-610-50."[40] The statute is drafted the same way: "It is unlawful in a ground water management area for any person to withdraw, attempt to withdraw, or allow the withdrawal of any ground water, other than in accordance with a ground water withdrawal permit or as provided in § 62.1-259, subsections C, D and F of § 62.1-260, and subsection C of § 62.1-261."[41]

Outside the two declared areas there is no prohibition to be excused from. The Department of Environmental Quality states this on its own program page, describing its permitting authority as operating "in the designated Groundwater Management Areas," and listing among activities that do not require a permit: "Withdrawals in any area not declared to be a GWMA."[42]

A precision point worth preserving. The statute and regulation exempt withdrawals of *less than* 300,000 gallons per month. DEQ's web copy describes the trigger as withdrawals "greater than or equal to 300,000 gallons per month." These are consistent. A withdrawal of exactly 300,000 gallons in a month falls inside the permit requirement, because it is not less than the threshold. The interval that triggers a permit inside a declared area is 300,000 gallons and up.

The same exemption does the same work inside the declared areas, and the Commonwealth knows the size of it. Presenting to the Eastern Virginia Groundwater Management Advisory Committee in March 2025, the United States Geological Survey put self-supplied domestic withdrawal in the Coastal Plain at roughly 200,000 wells drawing about **38 million gallons per day**, on an estimate of 80 gallons per capita, which is close to a third of

demand across the province. The summary of that presentation states the mechanism in the committee's own minutes: "Since the withdrawals are individually small, they do not require a permit, however collectively they add up to quite a large cumulative draw."[43]

That is the eastern parallel to the finding this section makes about the west, and it cuts against an easy reading of it. The volumetric exemption operates only inside the declared areas, and inside them it is large. What produces unmetered small demand west of the line is the statewide reporting threshold set out at Section 4, which is a different instrument with a different trigger. What differs is the remedy. Inside a declared area the Commonwealth funds a model, an observation network and a statutory advisory committee to size the ungauged fraction, and USGS presented an estimate of it to that committee. Outside, Section 7 establishes that no equivalent predictive model exists, and that the observation network west of the line is a floor of fifty-five wells across four physiographic provinces.

3.1 What a large groundwater user west of the line does not face

None of Loudoun, Fauquier, Culpeper, Clarke, Frederick, Warren, Shenandoah, Page, Rockingham, Augusta, or Rockbridge appears in the declaration.[44] For a user in any of them, the following provisions of Virginia law do not operate.

No withdrawal permit, and therefore no volumetric limit. A permit "shall authorize withdrawal of a specific amount of ground water."[45] Absent an application there is no permit, and absent a permit there is no specific amount.

No conservation plan condition. The Board "shall not issue a ground water withdrawal permit ... without an approved water conservation and management plan," which must contain six required elements and is incorporated as a permit condition.[46] The condition attaches to a permit that does not exist.

No evaluation of need, alternatives, or area of impact. The regulation's evaluation machinery, including the assessment of need and alternatives, the estimation of area of impact, and the criteria for issuance, all attach to "any application for a ground water withdrawal permit."[47]

No fixed term and no renewal review. Permits run for "a fixed term not to exceed 15 years," and renewal quantities are reduced by demonstrated conservation savings.[48] Neither mechanism reaches an unpermitted withdrawal.

No denial or revocation mechanism. The Board may revoke a permit, modify one, or deny an application, under Va. Code § 62.1-266(E) and the six sections of Part VI of 9VAC25-610: rules for modification and revocation at 9VAC25-610-290, causes for revocation at -300, causes for modification at -310, transferability at -320, minor modification at -330, and denial at -340. Every one of them takes a permit or a pending application as its object. West of the line there is neither.[49]

No local concurrence requirement. A permit application is incomplete without notification from the locality that the withdrawal complies with local zoning.[50] West of the line the Commonwealth never asks the county anything.

No DEQ well registration. The registration duty is drafted geographically: each private well "constructed in a ground water management area shall be registered by the certified water well systems provider with the Board within 30 days of the completion of the construction."[51] Its implementing rule is limited the same way.[52] The data set that registration collects, running to more than twenty fields including coordinates and datum, borehole depth and diameter, casing and screen specifications, grout and seal type, pre-pumped static water level, stabilized pumping level and yield, pump intake depth, and the driller's log, is collected only east of the line.[53]

No subdivision technical evaluation. A subdivision of thirty or more lots served by private wells triggers a DEQ technical evaluation, which must include a geophysical log from a borehole within the subdivision, at a fee the Department "shall charge ... not to exceed $5,000." Both instruments are territorial, though they do not use identical words: § 62.1-259.1 reaches a subdivision "located in a designated ground water management area," and 9VAC25-610-44(A) reaches one "located in a groundwater management area." Two limits belong on the record even inside a declared area. The requirement does not apply where all wells are drilled in the surficial aquifer, and the mitigation plan recorded with the plat is required only where the developer drills into an aquifer inconsistent with the Department's recommendation.[54] A two-hundred-lot well-served subdivision in Fauquier receives none of it.

No surficial-aquifer irrigation restriction. It is unlawful "in a ground water management area" to construct a well for nonagricultural irrigation except in the surficial aquifer.[55] Golf courses and landscape irrigation west of the line may drill to any depth.

3.2 What does apply, and which agency administers it

Three regimes reach west of the line. None of them limits a withdrawal.

Well construction is permitted statewide, by the Department of Health. The Private Well Regulations apply to owners of private wells with no geographic limit.[56] The regulation carries its own commencement date on its face: "After November 6, 2024, no person shall construct, alter, abandon, or increase the depth of a private well ... without a written construction permit from the commissioner." The permit runs eighteen months with provision for one renewal.[57] Within thirty days of completion the owner or the water well systems provider must furnish "the district or local health department" a uniform water well completion report.[58] The definition of "private well" expressly includes wells for "agricultural use, industrial use or other nonpublic water well."[59]

Note the routing. The completion report goes to the local health department. The Department of Environmental Quality appears in the private well regulations three times. 12VAC5-630-20 defines "DEQ." 12VAC5-630-60, captioned "Relationship to the Department of Environmental Quality," provides that observation, monitoring and remediation wells constructed under DEQ's supervision are governed by 12VAC5-630-420. That section conditions their temporary abandonment on the terms of a DEQ permit. There is no fourth occurrence in the chapter as retrieved in full on August 25, 2026. **DEQ's role in the private well regulations is therefore confined to observation, monitoring, and remediation wells constructed under its own supervision.**[60] The Board and the Department of Health exchange annual lists, but that provision sits inside the section that governs declared areas.[61]

Drillers are certified statewide at three levels under Title 54.1, with an eight-hour continuing education condition on renewal.[62]

Withdrawal is reported annually. This is the one duty that falls on the user, and Section 4 takes it up in full.

3.3 There is no agricultural exemption from the permit

An agricultural exemption from the groundwater withdrawal permit requirement is not present in the statutory exclusion list at § 62.1-259 and is not present in the regulatory exclusion list at 9VAC25-610-50 as of August 23, 2026. Both lists were retrieved in full. Neither contains an agricultural item.

Agriculture is defined in the regulation, and defining a use is not exempting it.[63] DEQ says so directly: "Any withdrawal of groundwater in a designated Groundwater Management Area greater than 300,000 gallons in any month will require a groundwater withdrawal permit unless otherwise excluded under 9VAC25-610-50. This requirement includes groundwater used for agricultural purposes."[64]

What agriculture receives is four narrower differentials, which should not be collapsed into an exemption. Crop irrigators report at a threshold of one million gallons in a single month rather than the general threshold, a trigger roughly 3.3 times more permissive.[65] A delayed compliance date, now long spent, applied to irrigator metering.[66] Agricultural irrigators are excluded from the surficial-aquifer well construction prohibition, which reaches nonagricultural irrigation only.[67] And a general permit pathway exists for surficial aquifer irrigation withdrawals above 300,000 gallons in a month.[68] A general permit is a simplified permit. The withdrawal remains permitted and conditioned.

4. Counting Without Allocating

Virginia collects withdrawal data from the entire Commonwealth and allocates water in two counties' worth of the Coastal Plain plus the Eastern Shore. The gap between those two facts is the subject of this section.

4.1 The reporting regulation is statewide and says so

The Water Withdrawal Reporting regulation contains five sections and no geographic qualifier. Its stated purpose is worth quoting in full, because the purpose clause names what the data are for:

> "This chapter requires the reporting of water withdrawal information to the board for its use in preparing plans and programs for the management of water resources of the Commonwealth pursuant to § 62.1-44.38 of the Code of Virginia. The data are used by the board in formulating water supply plans, for consideration by the General Assembly and in delineating surface water management areas and are available to local governments and private interests to assist them in their own water supply planning."[69]

The downstream uses the regulation names are planning and the delineation of *surface* water management areas. Groundwater management area delineation does not appear.

Applicability is drafted by rate, not by geography:

> "1. Except as stated in this section, this chapter applies to every user withdrawing groundwater or surface water in Virginia including the Potomac River abutting Virginia whose average daily withdrawal during any single month exceeds 10,000 gallons per day. Reportable withdrawals include, but are not limited to, those for public water supply, manufacturing, mining, commercial, institutional, livestock watering, artificial fish culture, and steam-electric power generation uses.
>
> 2. This chapter applies to every user withdrawing ground or surface water for the purpose of irrigating crops whose withdrawal exceeds 1 million gallons in any single month."[70]

No groundwater management area qualifier appears anywhere in the chapter. The exemption list confirms the reach rather than limiting it: the first exemption covers "users reporting under the provisions of the Groundwater Act the information here required," which exists to prevent double reporting by permit holders and presupposes that non-permit-holders are inside the rule.[71]

The duties are measurement and an annual filing. Every nonexempt user other than crop irrigators must install and operate a gaging device or methodology before commencing withdrawal, measuring cumulative volume at or near the source or at the treatment plant. Every nonexempt user must file with the Board by January 31 of each year, reporting name, address, sources and locations of withdrawal, cumulative volume withdrawn in each month of the preceding calendar year, maximum day withdrawal and the month in which it occurred, and the method of measurement.[72]

4.2 The General Assembly wrote the geographic distinction into both powers, in opposite directions

This is the structural fact on which the volume turns. In the same 1992 chapter, the legislature drafted the permit power to stop at the boundary of a declared area and drafted the information power to reach past it. The information power reads:

> "To require any person withdrawing ground water for any purpose anywhere in the Commonwealth, whether or not declared to be a ground water management area, to furnish to the Board such information with regard to such ground water withdrawal and the use thereof as may be necessary to carry out the provisions of this chapter, excluding ground water withdrawals occurring in conjunction with activities related to exploration for and production of oil, gas, coal or other minerals regulated by the Department of Energy."[73]

"Anywhere in the Commonwealth, whether or not declared to be a ground water management area" is deliberate drafting. So is "in a ground water management area" in the prohibition seven sections later. The Commonwealth reserved the right to know and declined the right to say no.

4.3 Reporting is not permitting

The two regimes differ on every dimension that matters.

	Reporting (9VAC25-200)	**Permitting (9VAC25-610; §§ 62.1-258 to 62.1-267)**
Geography	Virginia, no area qualifier	Declared areas only
Legal character	Registration and data submission	Authorization to withdraw; withdrawal without it is unlawful
Volume cap	None	Permit authorizes "a specific amount"
Prior review	None; filed after the fact by January 31 for the preceding year	Application, evaluation of need and alternatives, area of impact, criteria for issuance, public notice and comment
Conservation obligation	None	Mandatory approved plan, six elements, incorporated as a permit condition
Duration	Perpetual annual filing	Fixed term not to exceed 15 years; renewal reduced by conservation savings
Denial or revocation	No mechanism exists	Modification, revocation, denial provisions
Local concurrence	None	Application incomplete without locality zoning notification

The formulation this volume uses throughout: **outside a declared area, Virginia counts the water and does not allocate it.**

4.4 A numerical coincidence to defuse before it misleads

DEQ's public description of the reporting threshold reads "Average daily withdrawals exceed 10,000 gallons per day (300,000 gallons per month) for all other purposes."[74] That parenthetical places the number 300,000 in front of a reader who has just encountered the permit trigger of 300,000 gallons per month. The two tests are not the same.

The reporting test is a rate: average daily withdrawal exceeding 10,000 gallons per day during any single month, applied statewide. The permit test is a monthly volume of 300,000 gallons or more, applied only inside a declared area. Ten thousand gallons per day across thirty days is 300,000 gallons, so in a thirty-day month the two coincide. In a thirty-one-day month they do not, because a 10,000 gallon per day average over thirty-one days is 310,000 gallons. More importantly, one test is met by an average daily rate in any single month and the other by a volume in a month.

A user can be a reporter and never a permittee. For every large groundwater user in Loudoun, Fauquier and the Shenandoah Valley the second half is certain: none of them can be a permittee, because none of them sits inside a declared area. Whether each is in fact a reporter is a separate question, and this volume does not answer it, for the reason given at Section 1.

4.5 Where the data go

Reports are filed through the myDEQ portal. DEQ states that "Effective April 1, 2024, the previous VAHydro database was replaced by the myDEQ database. All VAHydro data has migrated to myDEQ."[75] A paper alternative, Form OWS-3N, remains available. The reported withdrawals are the input to DEQ's *Annual Water Resources Report*. They are also published to DEQ's public Water Withdrawals dashboard, whose public view aggregates to the twelve-digit hydrologic unit and carries no facility coordinates. **Why the coordinates are absent is not established here.** Va. Code § 2.2-3705.2 would permit their withholding, but no DEQ statement invoking that exemption for this dataset was located, and this volume does not assert that DEQ relies on it. Section 17.3 records the further limit that the dashboard's row-level facility table sits behind a terms-of-use agreement that was not accepted.[76]

Naming caution for anyone tracing this lineage. "VWUDS" is a legacy term. The sequence runs VWUDS to EDWrD in 2008, to VAHydro, to myDEQ on April 1, 2024. Facility-level data moved behind a login at the last step.

5. Why the Commonwealth Cannot See a Data Center

The two exemptions described so far both attach to the withdrawer. The territorial one asks where the withdrawal happens and the temporal one asks when it started, and a data center that buys finished water from a utility is not the withdrawer under either. It is exempt for a third reason, which is the subject of this section and which operates independently of the other two.

The reporting regime described in Section 4 is the Commonwealth's only statewide instrument for observing water use. It cannot observe a data center. A definition forecloses it.

The definition does more than obscure the load. It is the mechanism by which the load reaches the confined Potomac aquifer while remaining absent from every permit search anyone would think to run, and Section 8a traces that path county by county.

5.1 A data center on utility water is a customer, not a user

The reporting regulation defines the regulated person:

> "'User' means any person making a withdrawal of surface water or groundwater from an original source ... regardless of whether the user himself uses the water thus withdrawn or transfers it to another for use. The purchase of water from a waterworks by a customer of it does not constitute a withdrawal."[77]

A data center buying finished water from Loudoun Water, Fairfax Water, or Prince William Water is a customer of a waterworks. It has no registration duty, no metering duty, and no annual reporting duty. The water it uses enters the state record exactly once, as raw intake at the utility's intake structure, attributed to the utility, coded as public water supply, and located in the locality where the withdrawal point sits. Nothing in the record identifies the end use.

DEQ concedes the point in its own annual report:

> "Where data centers are using water, they are typically part of the distribution system of a larger public utility. As a result, their actual usage is aggregated into annual water withdrawal reporting as they fall within the capacity of a community water system (CWS)."[78]

The same passage states that DEQ "continues to pursue best practices for quantifying water withdrawals from data centers."

5.2 A second and independent defect: locality attribution follows the intake

Withdrawals are attributed to the locality of the withdrawal point rather than the locality of use. DEQ's 2024 reported withdrawals, excluding power generation, give Loudoun 17.19 million gallons per day against Fairfax at 70.47.[79] Those are Table 21 figures, and Section 8.2 records that Table 20 of the same report gives Fairfax Water's two intakes a combined 164.0, which is 2.33 times the Fairfax county line. Loudoun's figure understates water consumed in Loudoun by a wide margin, because the majority of Loudoun Water's supply is purchased from Fairfax Water and withdrawn at Fairfax County's Potomac intakes, and the understatement holds against either

Fairfax number. DEQ's own appendix warns that "not all water transfers are consistently reported to the DEQ."[80]

An analyst reading the state's withdrawal table county by county will therefore misattribute a large share of Northern Virginia's water twice over: once by locality, and once by end use.

5.2a The definition is what makes aquifer water invisible

Sections 5.1 and 5.2 describe a reporting gap. The gap has a consequence, and it is the most important thing in the section.

Caroline and King George draw their public supply entirely from the confined Potomac aquifer. This is verifiable permit by permit and screen depth by screen depth: Bowling Green at 214 feet under GWI000471; Hopyard Farm at 170, 185 and 240 feet under GWI000607; Presidential Lakes at 300 feet under GWI000495; Elsinore and Ruther Glen at 235 feet under GWI000470.[81]

Both counties sit inside the Eastern Virginia Groundwater Management Area, where the territorial exemption does not apply and where DEQ regulates by quantity and rigorously. Every gallon those utilities withdraw is permitted, metered and reported. A data center buying from either county is therefore consuming permitted aquifer water inside a declared management area, which is the one configuration this volume's territorial argument does not reach.

And it is invisible anyway. Under 9VAC25-200-10 the purchase of water from a waterworks by a customer of it does not constitute a withdrawal. The withdrawal is the utility's, the permit is the utility's, the reported volume is the utility's, and the record identifies the end use nowhere. A search of DEQ's groundwater permits under the name of a data center buying finished water returns nothing, and returns nothing correctly. Section 5.5 sets out the one facility located in this research that does hold a permit in its operator's name, and it holds it by inheritance from a power plant rather than by buying water.

The territorial exemption and the definitional one therefore do different work in different places, and neither is a special case of the other. West of the interstate the water is unregulated and unrecorded. East of it, in these two counties, the water is regulated and recorded, and the record attributes it to a county utility. In both cases the quantity a data center uses is a figure the Commonwealth does not hold.

5.3 The Joint Legislative Audit and Review Commission had to go around DEQ

The clearest external confirmation comes from the legislature's own auditors. In its December 2024 report on data centers, JLARC states in its methodology appendix that "JLARC staff received 2023 data center water usage information from water utilities," with usage "typically reported for anonymous, individual data center buildings."[82] DEQ appears in the water analysis only as a denominator.

The contrast with the same report's air analysis is instructive. For air, JLARC used "data provided by DEQ listing data center sites with active air emissions permits (which all Virginia data centers have for their diesel generators)."[83] DEQ functioned as a facility registry for air and could not

function as one for water. That asymmetry, produced inside a single report by a single research team working the same subject in the same year, is the strongest available evidence of the reporting gap.

The string "VWUDS" and the phrase "Virginia Water Use Data System" are not present in JLARC Report 598 as of August 23, 2026.

5.4 The corollary that governs every negative finding in this volume

No groundwater withdrawal permit exists for any data center in Loudoun, Fauquier, Culpeper, or western Prince William. That fact carries no information about groundwater use, because no such permit can exist in those places. The absence is an artifact of the boundary described in Section 2, not evidence about behavior.

Any analysis that reasons from "no permits on file" to "no groundwater use" in these counties is invalid. This volume does not make that inference and flags it wherever it appears in secondary treatments of the subject.

The same caution applies in the other direction to the state withdrawal dashboard. Its row-level facility table sits behind a terms-of-use agreement containing an indemnification clause, which was not accepted in the course of this research. It is the one public dataset that would show a facility reporting withdrawals without holding a permit. **No claim of presence or absence is made about that corpus.**

5.5 The one facility that does hold a permit, and why it proves the rule

A single Amazon Data Services site holds both Virginia groundwater and surface water withdrawal authorizations. It is in King George County, inside the Eastern Virginia Groundwater Management Area, and it holds them by inheritance from a coal plant.

The Birchwood Power Facility closed on March 1, 2021 and was demolished by May 2022.[84] Its permits did not close with it.

The groundwater permit is fully documented and small. GWI000502 was in draft reissuance with a comment period running from August 12 to September 11, 2026. Its predecessor, GW00187EU, authorized 7,000,000 gallons per year and 2,000,000 gallons per month, and was transferred from Birchwood Power Partners, L.P. to Amazon Data Services, Inc. by minor modification completed January 24, 2024. The proposed reissuance *reduces* the authorization to 6,400,000 gallons per year and 640,000 gallons per month, an average of **17,534 gallons per day**. Reported withdrawals across the 2016 to 2025 term peaked at 4,989,076 gallons in 2018, all under the coal plant; post-closure annual figures run between 26,831 and 37,958 gallons. DEQ's evaluation attributes an estimated ninety percent of the withdrawal to human consumptive use, derived as thirty-five gallons per employee per day across 450 employees. The permit is for potable, irrigation and washdown use. **It does not authorize cooling.**[85]

The surface water permit is the cooling permit, and DEQ has published no number for it. VWP Permit No. 17-0702 remains active in DEQ's permit register and authorizes, in the

department's own words, "surface water withdrawal from the Rappahannock River for industrial cooling water." The same fact sheet adds that the permit "would require a major modification to include potable water as part of the beneficial use."[86] The two instruments are complementary and each excludes the other's purpose. The applicant's zoning narrative to King George County confirms the arrangement and supplies the sentence that names the temporal category exactly: all cooling water for the data center will come through the intake permitted under VWP 17-0702, and "the Intake was originally permitted to provide water to the Power Facility."[87]

What DEQ has not published is any quantity. The issuance date, the expiration date, the permittee of record and every volume limit of 17-0702 are absent from the department's document library, its site search index, the GWI000502 permit package, and the archived record of deq.virginia.gov, as of August 25, 2026. A figure of 6.6 million gallons per day through 2034 circulates in press coverage attributed to DEQ; it is not traceable to any DEQ document in the corpus searched and is not cited as a DEQ figure in this volume.[88]

And on August 20, 2026 that reissuance drew a letter of opposition from a sitting senator. Senator Richard Stuart of King George, the author of Senate Joint Resolution 25, wrote to the Director on the day of the hearing expressing his "firm opposition" to the permit, on the ground that the agency's own report says the aquifer cannot absorb new major withdrawals:

> "The Commonwealth should not tell the people of King George County that the aquifer is too depleted for their drinking water while declaring it available for a data center campus. Issuing this permit would make a mockery of the Department's own findings."[89]

King George County is under separate pressure on the same aquifer. DEQ directed the county to reduce its reliance on the Potomac aquifer and move its public supply to the Rappahannock River, a transition county officials put at $100 million.[4] Section 14 establishes that the Rappahannock was at record lows through the spring of 2026.

Two published characterizations of the Birchwood withdrawal appear to conflict. One describes 6.4 million gallons a year drawn from the Potomac aquifer for the facility's cooling system; DEQ's own evaluation attributes ninety percent of the same volume to human consumption.[90] The two are reconcilable, and the resolution is that the press account conflates two separate permits. The aquifer permit is the drinking fountain, at 17,534 gallons a day, for potable use, expressly not cooling. The river permit is the cooling tower. Only one of the two carries a published volume, and it is the smaller one.

The scoped finding. Across the corpus searched, which is Virginia Permit Transparency as of August 23, 2026 (all forty-four groundwater withdrawal records and all ten surface water withdrawal records enumerated), DEQ's *Annual Water Resources Report* of December 2025, and the 2020 State Water Resources Plan, **this is the only data center located holding a groundwater withdrawal permit in its operator's name, and it holds it because it bought a power plant that already had one.** Virginia Permit Transparency tracks applications rather than the standing permit universe, so a permit issued earlier and never modified would not appear there. The claim is scoped to those corpora and to those dates.

Scoped negative findings. No data center is named as a withdrawer in DEQ's *Annual Water Resources Report* of December 2025 as of August 24, 2026; a full-text scan for Amazon, Vadata, Microsoft, Google, Equinix, Digital Realty, QTS, CloudHQ, Vantage, Aligned, STACK, EdgeCore, and Iron Mountain returned zero occurrences of each. The phrase "data center" and all operator names are not present in the 2020 State Water Resources Plan, published January 2022, as of August 24, 2026. No withdrawal permit for a data center in Loudoun, Fauquier, Culpeper, or western Prince William is present in Virginia Permit Transparency as of August 23, 2026, where all forty-four groundwater withdrawal records and all ten surface water withdrawal records were enumerated. That last finding is subject to the corollary in Section 5.4 and to a second limit: Virginia Permit Transparency tracks applications rather than the standing permit universe, so a permit issued earlier and never modified would not appear.

A lead not yet run to ground. Two Virginia Department of Health private well construction permits are held by Amazon Data Services, Inc. on Kentucky Springs Road in Mineral, Louisa County, received May 28, 2024. Louisa County lies outside any declared groundwater management area. This is the configuration Section 3 describes, and it is the closest thing located to a data center on its own wells. It is not established that these wells serve cooling, and this volume does not assert that they do.

5.5a The same defect appears one level down

The definitional exemption keeps a quantity out of the state's record. A related failure keeps quantities out of utilities' own records, and it surfaces wherever a utility's operating rules are denominated in a figure the utility does not publish.

The Fauquier County Water and Sanitation Authority is the clearest instance located. Its Comprehensive Drought Management and Emergency Preparedness Plan sets every stage trigger as a percentage of permitted capacity: Normal below 75 percent, Watch at 75 to 85, Warning at 85 to 95, Emergency above 95.[91] No system-wide permitted or rated capacity figure appears in the Authority's FY2025 annual financial report, its FY2026 or FY2027 adopted budgets, its drought page, or the consumer confidence reports retrieved, as of August 25, 2026. The ladder is calibrated in a quantity that is not publicly available, so no outside reader can determine which rung the utility is standing on. Section 8.4 takes this up in the county's own terms.

The two failures are not the same failure. One is a definition in a regulation that exempts a class of user from reporting. The other is an omission from a set of published documents. What they share is the result: a decision rule that turns on a number nobody outside the room can check.

5.6 One court has held that the water use is public

Everything above concerns what the Commonwealth's regulatory instruments can see. A separate question is what the public can compel, and on that question Virginia acquired a precedent in November 2025.

The Western Virginia Water Authority released its agreements covering the Botetourt campus with the water usage figures redacted, citing the proprietary information exclusion of the Virginia Freedom of Information Act. A newspaper editor sued the authority's executive director in his

official capacity in Roanoke Circuit Court on October 9, 2025. On **November 5, 2025, Judge Leisa Ciaffone held that a data center's water usage is not a trade secret**, writing that "there are few resources more precious than water" and citing the public interest in how much of it a private project would consume. **Two limits belong on the ruling.** The holding and the quoted language reach this volume through press accounts of the proceeding; no opinion, order or docket entry from the Roanoke Circuit Court was retrieved. And this volume does not say the ruling is the first of its kind in Virginia. Circuit court opinions are not comprehensively reported in the Commonwealth, so no search of them could establish that it is.[92]

The operator intervened alongside the authority. The Court of Appeals declined to stay the order on January 28, 2026 and declined again on renewal. Facing a civil contempt hearing set for March 3, 2026, the authority released the unredacted records on February 23, and the figures were public by February 25. All four dates rest on press coverage of the proceeding and are labeled press under the standard at Section 1. No stay order, docket entry, contempt petition or release letter was retrieved, and no Court of Appeals record number was located.[93]

Three things follow, and the volume should keep them separate.

The holding is narrow in one respect and broad in another. It concerns records already in the hands of a public body, which means it reaches a utility's contracts and not a data center's own meters. But within that scope it disposes of the trade-secret objection that has been the standard basis for withholding, and it does so on the record of a Virginia circuit court rather than by inference.

It does not create a duty to collect. A public body cannot be compelled to disclose a figure it never gathered. Sections 4 and 5 establish that outside a declared groundwater management area the Commonwealth gathers almost nothing, and that a data center on utility water is invisible in the reporting regime by definition. The ruling opens records that exist. It does not cause records to exist.

And it arrived eight months after the land sale closed. The 2 to 8 million gallon per day range, the infrastructure terms, and the new-source cost provisions all date their public existence to February 2026. The entitlement, the land transfer, and the authority's unanimous vote all preceded it. **The litigation proceedings themselves belong to the Botetourt case study; what this volume takes is the holding.**

6. What the Rock Does

Three aquifer systems meet in Virginia, and a withdrawal means something different in each. The word "drawdown" carries a single meaning east of the Fall Line and two quite different ones west of it. Any argument that moves a regulatory concept across that boundary has to survive the physics first. **Section 7.3 relies on this section, and specifically on §6.2 and §6.4.**

6.1 The confined Coastal Plain, for reference

East of the Fall Line the water is in sand, the sand is separated by clay, and the whole column is under pressure. Aquifer performance tests in the Potomac aquifer return storage coefficients between 0.000052 and 0.0012; the value USGS uses when it wants a representative number is a storage coefficient of 0.0001 against a transmissivity of 10,000 square feet per day.[94][95]

Three properties of that system matter for everything that follows. It has a **head surface**, a measurable pressure level whose position before pumping is known and against which a decline can be expressed as a percentage. Most of what comes out is drawn from the clay confining units rather than from the sand, and the clay does not re-expand, so the loss is largely permanent and registers as land subsidence at the surface.[96][97] And the medium is layered, laterally continuous, and thoroughly characterized, which is why a fifty-year deterministic model can be built on it.

Section 7 sets out what the Commonwealth's model of that system returns. This subsection exists only to establish the contrast the next two draw against.

6.2 Piedmont and Blue Ridge crystalline rock

West of the Fall Line the storage is not in the rock. USGS puts the numbers side by side: "The porosity of the regolith ranges from about 20 to 30 percent, but the porosity of the bedrock ranges from only about 0.01 to 2 percent."[98] The regolith is the weathered mantle above bedrock, and it is the reservoir. Below it, "Water in the bedrock is stored in and moves through fractures, which form the only effective porosity in the unweathered rock," and "the size, number, and interconnection of the fractures decrease with depth."[99]

The consequence for a well is stated plainly in the same source: "The thicker the regolith, the greater the volume of water in storage and the more likely well yield can be sustained. Where the regolith is thin, crystalline-rock wells are more likely to go dry during the summer months or periods of drought."[100]

Yields are small, and they fail suddenly rather than gradually. Where rock is fractured only near the surface, wells "will yield from 10 to 20 gallons per minute for a short time until the fractures are drained, when well yield suddenly declines."[101]

The Virginia numbers. USGS and DEQ together produced a groundwater flow model for Bedford County that is the closest thing the Commonwealth has to a western analogue of its Coastal Plain model. Transmissivity ranges from 7 to 800 square feet per day with a mean of 73. Horizontal hydraulic conductivity ranges from 0.04 to 8.6 feet per day with a mean of 1.7, values USGS places "at the lower end of the range" of comparable measurements elsewhere. Median well

yields by map unit run between 5 and 12 gallons per minute. Median depth to bedrock is between 53.5 and 58 feet; median well depth is 300 to 305 feet.[102] Statewide, USGS notes that public supply wells in the Blue Ridge and Piedmont "were less likely to be high yielding (less than 100 gallons per minute) than wells in other physiographic provinces in the State."[103]

Recharge is fast and shallow. The Bedford model carries a mean recharge of 9.4 inches per year, with cell values from 4 inches near streams to 28. USGS studied base flow across all three western provinces of Virginia and found effective recharge from 0.07 to 33.07 inches per year with a **median of 8.32**, sitting alongside the Bedford mean.[104][105] The system refills seasonally, and it fails seasonally.

And the criterion says so itself. The eastern drawdown test is written for confined aquifers on its own face, which is the point Section 7.3 turns on. DEQ may issue a permit only where its technical evaluation shows that the withdrawal "will not lower water levels, **in any confined aquifer that the withdrawal impacts**, below a point that represents 80% of the distance between the land surface and the top of the aquifer."[106] The limitation is not an oversight of drafting. Five subdivisions earlier the same regulation addresses unconfined aquifers expressly, requiring that no pump be set "lower than the top of the uppermost confined aquifer that a well utilizes as a groundwater source or lower than the bottom of an unconfined aquifer that a well utilizes as a groundwater source."[106] The drafters knew both conditions existed and wrote the percentage test for one of them.

And DEQ carried the limitation forward when it asked to have the criterion codified. On August 20, 2026 the Director asked the State Water Commission to recommend that the General Assembly write this criterion into the Act, and his own slide reproduces it with the confining words in place: the Act should be amended to provide that the Department may deny a permit where "[t]he cumulative stabilized impact of the proposed withdrawal in combination with all existing lawful withdrawals will lower water levels **in a confined aquifer** below a point that represents 80% of the distance between the land surface and the top of the aquifer."[107] The agency was not asked whether the criterion could reach an unconfined system and did not address it. What the slide establishes is narrower and worth having: when DEQ proposed to move this test from regulation into statute, five days before this volume closed, it moved the confined-aquifer limitation with it. **And the agency's technical contractor states it the same way in the model itself.** Aquaveo's annual simulation defines the object the criterion tests in one line: "Critical Surface = 80% from the surface to the top of the aquifer," and a critical cell as "a model cell where the computed water level is below the critical surface."[108] A surface measured from ground level to the top of an aquifer presupposes an aquifer with a top to measure to, which is what a confining unit provides and what fractured crystalline rock does not.

What that leaves west of the line. A confined aquifer has a prepumping potentiometric level, which is what makes it possible to express a decline as a percentage of available head. In the crystalline and undifferentiated sedimentary rock that USGS puts at about 86 percent of the two provinces across its seven-state segment, water is stored in regolith and moves through fractures, and USGS describes the movement as running "generally along short flow paths from interstream recharge areas to the nearest stream."[109] There is no laterally continuous pressure surface of the

eastern kind for a percentage to be taken against. Failure in this system is a well going dry in late summer, which is a different quantity, measured at a different place, on a different clock.

One part of the corridor is not crystalline rock, and it does not help. The Culpeper Basin is the third largest of the early Mesozoic rift basins and runs ninety miles north-northeast from the southern border of Madison County, through Culpeper, Fauquier and Loudoun, into Maryland. USGS describes the early Mesozoic basins as a class, the Culpeper among them, as carrying "a series of aquifers of tabular form that alternate with confining units that are several tens of feet thick," across which "the hydraulic connection ... is poor."[110] Confined conditions occur in rocks of that kind, and with them, in principle, a head surface the eastern criterion could be measured against. The Basin lies entirely outside every declared groundwater management area. **This is the clearest part of the corridor where the percentage test could physically be applied, and it is a part where no permit exists to apply it to.** Whether any Valley and Ridge unit west of it produces the same condition has not been examined here.

And these are the aquifers that fail after they are tested. USGS records that many wells in the early Mesozoic basins "yield large quantities of water during pumping tests that range from 24 to 48 hours but fail to maintain large yields over long periods of time," and that wells tested at 75 gallons per minute soon after completion "declined in a few years to about 15 gallons per minute."[110] A yield demonstrated in a twenty-four to forty-eight hour pumping test, in the one western terrane that can produce a confined head surface, is no evidence of a yield that survives the term of a data center. There is no permitting moment there at which anyone would be required to look again.

6.3 Valley and Ridge karst

In the Great Valley the water is in solution conduits, and almost nothing about the porous-medium picture survives.

Virginia's Great Valley carbonate and shale units "commonly yield from 150 to 1,000 gallons per minute to wells," while Silurian and Devonian limestones west of the Great Valley "typically yield only 20 gallons per minute or less."[111] Interquartile ranges of potential yield to the province's 412 most productive wells run from 210 to 1,400 gallons per minute in dolomite and 80 to 720 in limestone.[112] Those are not distributions around a mean. They are the signature of a system in which a well either intersects a conduit or does not.

Clarke County is the Virginia case study. Well yields there range from 0.4 to 600 gallons per minute and cluster at the extremes, either below 5 or above 50. USGS draws the moral itself:

> "some areas contain a dense concentration of both low- and high-yielding wells. This is one example of the degree of complexity inherent with karst and fractured-rock aquifer systems ... Many of the high-yielding wells are less than 200 ft deep, whereas the low-yielding wells generally are greater than 300 ft deep."[113]

Storage is the thing that is missing. The same report is explicit, and this is the load-bearing sentence for the whole section:

> "Changes in groundwater storage are normally negligible in water-budget calculations in karst and fractured-rock flow systems because the specific yield of these types of systems is low."

USGS uses an estimated specific yield of **0.01** for the zone of water-level fluctuation, and concludes: "Groundwater storage in the type of aquifer systems in Clarke County is minimal; therefore, the amount of water that recharges the groundwater system each year is critical."[114]

And the interference test fails. Section 62.1-257(A)(2) of the Code makes it a statutory predicate for declaring a groundwater management area that the wells of two or more users are "interfering or may reasonably be expected to interfere substantially with one another."[115] But flow here concentrates in conduits running for thousands of feet to several miles, and in karst, USGS observes, "closely spaced wells might encounter different systems of rock openings, in which case pumping from one well will not affect the water levels in an adjacent well."[116] Non-interference between adjacent wells is normal in the Great Valley, and it carries no information about whether the resource is in trouble.

Nothing jurisdictional turns on that, and Section 13.4 explains why. Section 62.1-257(A) states four conditions in the disjunctive, and subsection B requires the Board to find that "any one" of them exists. A Board could proceed on declining levels, on overdraft, or on contamination without reaching interference. The point here is diagnostic rather than jurisdictional: the statutory vocabulary was written for a porous medium, and one of its four indicators does not translate to karst.

6.4 What "drawdown" means in each place

Three storage numbers set side by side carry the argument.

System	Storage parameter	Source
Confined Potomac aquifer	Storage coefficient approximately 1×10^{-4}	Aquifer performance tests, SIR 2009-5039
Unconfined sand	Specific yield 0.21 (fine) to 0.27 (coarse)	Johnson, 1967, cited in SIR 2009-5039
Virginia karst and fractured rock	Specific yield approximately 0.01	SIR 2010-5112, Clarke County

East of the line, drawdown is depressurization of a still-saturated aquifer, drawing most of its water from clay that will not re-expand, propagating for miles through a continuous medium, and recording itself as subsidence at the land surface. It is slow, regional, cumulative, and close to permanent.

In crystalline rock, drawdown is the draining of a thin regolith reservoir plus the dewatering of whatever sparse fractures a borehole happens to cross. It is local, sharp, seasonal, anisotropic, and specific to particular neighbors. The characteristic failure is not a gradual decline but a step: yield holds, and then the fractures drain and it does not.

In karst, drawdown is not a cone in any conventional sense. It is a capture problem. The risk shows up as spring failure, loss of base flow, and contaminant breakthrough rather than as a regional water-level surface, and it can show up at a spring miles from the well that caused it while leaving the well next door untouched.

Author's note on an absence. There is no compaction-driven subsidence mechanism west of the Fall Line, because there is no thick compressible confining column to compact. That inference is drawn from the absence of the mechanism Circular 1392 identifies rather than from any source affirmatively excluding subsidence in the Virginia Piedmont. No USGS publication measuring or excluding withdrawal-driven subsidence west of the Fall Line in Virginia was located in the USGS Publications Warehouse as searched on August 23, 2026.

7. The Model Stops at the Fall Line

The Commonwealth's groundwater permitting rests on a numerical model. The model was built with the Piedmont as a wall.

7.1 The boundary condition, verbatim

USGS documented the Virginia Coastal Plain flow model in 2009. Its domain and its western edge are described in the report itself:

> "The 24,486-mi2 area (159 mi by 154 mi) encompassed by the model grid extends in an east-west direction from the Fall Line to the continental shelf and from 31 mi south of the Virginia-North Carolina State line to about 25 mi north of Point Lookout in Maryland."[117]
>
> "The westernmost boundary of the model coincides with the Fall Line and is considered impermeable to flow. This assumption is supported by the large difference in hydraulic conductivity between the rocks of the Piedmont physiographic province and the unconsolidated sediments of the Coastal Plain physiographic province."[118]

DEQ describes the same domain in its own 2026 report, and adds a qualification worth stating precisely because it cuts against the simple version of this argument. The lateral and bottom boundaries are designated no-flow, with two exceptions:

> "Lateral boundary flow is set to model underflow to the north, out of the model into Maryland, and **from the Piedmont physiographic province into the model over the Norfolk structural arch**. These two boundary conditions were partially changed from their original no-flow condition to specified flux boundaries to aid in calibrating the model."[119]

So the western boundary is not everywhere impermeable in the operational model. At one structural feature a specified quantity of Piedmont water is admitted, and it was admitted to resolve a calibration discrepancy rather than to represent anything about the Piedmont. **The Piedmont enters this model as a boundary condition and never as a simulated domain.** Nothing west of the line is computed. A volume of water is handed across at one location so that the eastern arithmetic closes.

That paragraph disposes of the transferability question without any argument from first principles. The model does not merely stop at the Fall Line for convenience. It is *founded* on the proposition that the crystalline province is hydraulically a different object, and it names the hydraulic conductivity contrast of Section 6.2 as the justification. A model whose defining assumption is that the Piedmont is another world cannot be repointed at the Piedmont.

7.2 What the model is, and what DEQ runs today

The 2009 documentation describes a SEAWAT-2000 variable-density simulation using the Hydrogeologic-Unit Flow package, on a grid of 134 rows by 96 columns and 60 layers at one-square-mile cell spacing, with the upper 48 layers a uniform 35 feet thick and the base of the lowest layer at an altitude of minus 2,470 feet. The density field came from a separate 108,000-

year simulation of Pleistocene freshwater flushing. A 113-year transient simulation running from 1890 was discretized into 34 stress periods and calibrated against 7,183 water-level observations from 497 observation wells using UCODE-2005 and PEST, achieving a root mean square error of 3.6 feet. Withdrawals reached about 117 million gallons per day by 2003 and produced drawdown exceeding 200 feet in places.[120]

The operational descendants are DEQ's own. USGS records that "the updated, operational models of the Virginia Coastal Plain and Eastern Shore, maintained and used by DEQ, are known as the VAHydroGW-VCP and VAHydroGW-VAES models," that the Coastal Plain model was recalibrated in 2019 by the consulting firm Aquaveo under contract to DEQ, and that both "simulate historical groundwater flow from approximately 1900 to the present and project groundwater conditions 50 years into the future."[121]

Nomenclature. DEQ does not use the phrase "Virginia Coastal Plain Groundwater Model." Its documents say "Virginia Coastal Plain Model" or "VAHydro Groundwater-Virginia Coastal Plain Model." USGS says "VAHydroGW-VCP." Any of the three is defensible; a fourth is not.

7.3 What the model says about its own western edge

In July 2026 DEQ delivered a study whose title is itself evidence for Section 2: **Senate Joint Resolution No. 25, "Groundwater Supply East of Interstate 95."**[122] The General Assembly asked the agency to study the groundwater supply of a region defined by a highway, and the agency's opening sentence explains the substitution: the area "generally encompasses the Virginia Coastal Plain (VCP) aquifer system."

The study tested a hypothetical withdrawal of three million gallons per day at nine locations inside that system and computed, for each, the maximum amount that would pass the Commonwealth's technical permitting criteria.

Location	Locality	Maximum-passing amount, gallons per day
Surprise Hill	Northumberland County	360,000
Eastern Shore centroid	Accomack County	180,000
Northern Neck centroid	Richmond County	180,000
Middle Peninsula centroid	King and Queen County	180,000
York-James centroid	James City County	120,000
Southeast Virginia centroid	City of Chesapeake	120,000
Northwest Coastal Plain centroid	**Caroline County**	**60,000**
Middle James centroid	**Henrico County**	**less than 30,000**
Chowan centroid	**Sussex County**	**less than 30,000**

None of the nine passed at three million gallons per day.

A boundary note. The SJ 25 study is treated at length in a separate volume in this series, *The Aquifer Says No: DEQ's SJ 25 Groundwater Study and the Data Center Question East of I-95*. This volume takes from it only what bears on the western argument: the gradient toward the Interstate 95 boundary, and the model-domain limit set out in Section 7.4. The eastern implications of the study belong to that volume.[123]

Three findings in that table bear directly on this volume.

The best case is not where the development is. Only Surprise Hill, at 360,000 gallons per day, could support what DEQ describes as a typical hyperscale data center, which it puts at approximately 300,000 gallons per day for 100 megawatts of information technology capacity across about 3.2 million square feet. DEQ notes that the location "is near Reedville at the Chesapeake Bay end of the Northern Neck, far from the areas where most development is occurring."[124]

Two locations failed at one percent of the request. The Middle James and Chowan centroids fell in cells the annual simulation already predicts as critical, meaning any area of impact violates the 80 percent drawdown criterion. In DEQ's words: "even a withdrawal of 30,000 gal/day (1% of the requested 3 Mgal/day) was found to generate an AOI; lower withdrawal amounts were not simulated."[125] Thirty thousand gallons per day is the lower limit of the analysis rather than a floor on the aquifer. The true figure is unknown because DEQ stopped asking.

And the scarcity is worst at the western edge. DEQ states the pattern plainly: "For regions in the western portions of the VCP, groundwater availability is quite limited, as indicated by the widespread areas of critical cells projected by the annual simulations."[126] The higher maximum-passing values "generally located farther north and east." The Middle James centroid is in Henrico County and the Chowan centroid is in Sussex, both toward the Interstate 95 boundary.

The comparison the table invites is not the one to draw. Immediately east of Interstate 95, in the Middle James region, the Commonwealth's model will not permit thirty thousand gallons per day. Immediately west of it no permit is required at any volume. The temptation is to read that as one regime being strict and its neighbor being lax about the same thing. Section 6 forecloses that reading. The Middle James centroid fails a drawdown criterion measured against prepumping head in a confined aquifer, and fractured crystalline rock has no confined head surface, no comparable storage behavior, and therefore no drawdown criterion capable of being violated. In the crystalline rock that covers most of the west, the eastern test could not be run. It would return nothing.

What the west lacks is not the eastern criterion. It is any criterion suited to its own physics. The Commonwealth has developed a quantitative standard for one of its two aquifer systems and has developed none for the other, and Section 6 sets out what such a standard would have to measure: seasonal recharge against storage in a system whose storage is a fraction of a percent of its volume, in which failure appears as wells going dry in late summer rather than as a head surface declining over decades. No such standard is present in Chapter 25 of Title 62.1, in 9VAC25-610, in 9VAC25-780, or in Item 366 of the 2026 Appropriation Act, on the corpus and

dates set out at Section 1. It was not attempted in SJ 25 by design, and is not contemplated in any instrument this volume has located.

One more feature of the eastern program bears on the comparison. Aquaveo's current simulation allocates reported Coastal Plain withdrawal by locality, and the distribution is not broad. Isle of Wight at 25.21 percent and King William at 25.08 percent together account for **just over half of all reported groundwater use in the modeled area**, on a 2020 to 2024 average of 64.36 million gallons per day. Those are the paper-mill counties, Franklin and West Point, whose withdrawals Section 7.2 records as the ones that drove regional water levels below sea level and whose reduction the program counts as its principal achievement.[108] The regime this volume is comparing against is one built around two legacy industrial users, and it works on them. The load this volume counts is a different kind of user in a different province, and the program does not reach it.

The regime is at its most developed precisely where it ends.

7.3a The same report, read the other way

Three presenters took the SJ 25 report to the Commission on August 20, in this order: the Director, then Andrea Wortzel of Troutman Pepper Locke for Mission H2O, then Jay Ford of the Chesapeake Bay Foundation.[127] Mission H2O is a stakeholder group formed in 2007 whose members, in its own words, mostly "withdraw from the Potomac Aquifer in the Eastern Virginia Groundwater Management Area." Its reading of the same report is the opposite of the one a reader might take from Section 7.3, and it deserves to be stated rather than left to be discovered.

Mission H2O's case is that the framework is working. The fourteen largest permitted withdrawals were cut from 146.54 million gallons per day in 2014 to 73.59 in 2026. Total reported use has been broadly level since about 2015. Water levels have improved. There is no evidence of regional saltwater intrusion, the inland salt wedge having been recognized as early as 1913, and the subsidence study the report relies on compares 1900 to 2008 and predates the withdrawal reductions. The SWIFT recharge program will add 50 million gallons per day of capacity, 32 at the 65 percent contractual basis, and the presentation projects the aquifer water balance improving from 73 to 123 million gallons per day across the program's phases.[128]

The withdrawal reduction is documented and this volume does not dispute it. The other claims are of different kinds and should not be ratified together: the water-level and saltwater findings are readings of the SJ 25 report that this volume has not independently tested, and the aquifer water balance figure is a projection across a program that is not yet built.

A second series bears on the same question and runs the other way. Aquaveo's current annual simulation, presented to the advisory committee in April 2026, gives total permitted withdrawal allocated to the Coastal Plain model as 168.9 million gallons per day in 2015, 104.0 in 2024 and **108.6 in 2025**.[108] That is a different measure from Mission H2O's fourteen largest permits, and the two should not be netted. What it shows on its own terms is a long decline and a 4.6 million gallon per day increase in the most recent year the model has been run.

Most of it is not in conflict with this volume, and the reason matters. Every claim in the presentation concerns the Eastern Virginia Groundwater Management Area, which is where

the permits, the model, the extensometers and the recharge wells all are. This volume's subject is the part of the Commonwealth where none of those things exist. Mission H2O's presentation is evidence that the eastern regime does what a regime does, offered about a province this volume does not describe.

One claim does reach a number this volume uses, and the volume cannot yet answer it. Mission H2O says the SWIFT program will add 50 million gallons per day of recharge capacity, which its presentation puts at 32 on the 65 percent basis its contracts use. The maximum-passing withdrawals this volume takes from SJ 25, including the 60,000 gallons per day at the Caroline centroid, come from a fifty-year predictive simulation. Whether that simulation carries SWIFT recharge is not stated in the SJ 25 report as read for this volume, and it is not established here. If it does not, the centroid figures are conservative by an amount this volume has not quantified. Section 17 records the gap.

One of Mission H2O's own recommendations is worth recording, with its limits. Among its proposals for addressing unpermitted withdrawals it asks the General Assembly to "[r]educe the exemption level (currently 300,000 gallons per month)" and to make DEQ's recommendations for subdivisions of more than thirty residential wells enforceable rather than advisory.[128] That is the volumetric exemption, and it operates only inside a declared management area. Lowering it would change nothing in Loudoun, Fauquier or Culpeper, where Section 3 establishes that the barrier is territorial and carries no volume threshold at all. The agreement is therefore about the eastern half of the problem. It is worth noting because the aquifer's own major withdrawers think the unpermitted fraction large enough to legislate about, and for no more than that.

7.4 The model does not cover the whole area DEQ regulates

The Fall Line boundary is a design decision, documented and justified. What the agency added on August 20, 2026 is different and has not been widely noticed. Presenting the SJ 25 recommendations to the State Water Commission, having just reported that the maximum new withdrawal available anywhere in the Coastal Plain without creating a critical cell was 360,000 gallons per day in the Northern Neck, the Director said:

> "And then lastly, we have problems with. We. The model doesn't quite cover the whole area right now. So until we extend the model or get funding for that, we need and get more data because we don't have any good groundwater data up there, we need to be able to prohibit more water withdrawals."[129]

He moved directly into a recommendation that local comprehensive plans "be limited in this area to limit planned growth based on groundwater availability." The slide then on screen gives that recommendation a scope it does not carry in the quotation. The General Assembly should amend Chapter 22 of Title 15.2 "to require local comprehensive plans **in GWMAs** to limit planned growth based on GW availability if no other water supply is feasible."[130] The land-use remedy DEQ proposes for a groundwater problem reaches only inside declared management areas. It does not reach Loudoun, Fauquier or Culpeper, for the same reason nothing else in this account does.[131]

The referent does not rest on the recording alone. The Director's own slides, posted with the meeting materials, carry the recommendation he was reading from. Recommendation 1(d) asks the General Assembly to "[p]rohibit DEQ from issuing permits for new significant withdrawals in portions of GWMAs located outside the extent of the applicable GW flow model."[132] That is the prohibition the quotation above describes, in the agency's words, in a document. The recommendation, numbered #7 in the report's list of twelve, names no geography in its own text, saying only "outside the extent of the applicable GW flow model." The report's supporting paragraph for it points to "the geologically distinct region north of Fredericksburg" (p. 110), and the report passage that follows draws the line at Stafford. **DEQ's report states the geography, and names the line.**

> "The VCP groundwater flow model's domain encompasses an area **from Stafford, Virginia, south** to the adjacent Coastal Plain of North Carolina, and from the Fall Zone to the Eastern Shore of Virginia ... **The VCP area north of Stafford, Virginia, is outside the model domain boundary due to the incomplete characterization of this geologically complex area along the Fall Zone**, which is also somewhat isolated from the rest of the VCP aquifer system."[133]

That settles it. "The whole area" is the Eastern Virginia Groundwater Management Area, and "up there" is the part of it north of Stafford. The slide then on screen carries the same geography. It is a map of Virginia Coastal Plain groundwater budget regions bounded on the west by the Fall Zone, on which every region is Coastal Plain and the Piedmont does not appear at all.[134]

Set the two boundaries side by side, because they are not the same boundary.

The Eastern Virginia Groundwater Management Area includes the portions of Fairfax, Prince William, Stafford, Spotsylvania and Caroline counties east of Interstate 95, and King George County entire. The model domain begins at Stafford and runs south. **Everything the Commonwealth regulates north of Stafford sits outside the instrument it regulates with**, and DEQ gives the reason: the area is geologically complex along the Fall Zone and incompletely characterized.

This is a different finding from the one in Section 7.1 and should not be merged with it. That the model stops at the Fall Line is a documented design decision, justified by a conductivity contrast, and it is why the model cannot be pointed west. That the model stops at Stafford is a gap inside the managed area itself, and the agency administering the permit program said in public that it lacks good data for the part its model does not reach.

7.5 Where the 2026 money went

Three groundwater instruments were funded in 2026. Two of them look east. The third looks west, and it exists only as a paragraph in an appropriation act.

The monitoring stations. Item 366, paragraph Q of the enacted budget provides $1,150,000 in the first year only, from the general fund, for DEQ "to install up to five additional multi-well research stations to gather additional data to study the upper portions of the Eastern Virginia Groundwater Management Area."[135] Paragraph Q funds a ceiling, "up to five," rather than a count, and unlike paragraphs N and O it names no report and no recipient committee. It is not, however,

single-year money in the sense of lapsing: the same paragraph provides that "Any funding remaining on June 30 shall be carried forward and reappropriated into the next fiscal year for the purposes described in this paragraph."[136] Paragraph P, the statewide PFAS disposal analysis, likewise carries no report date and no recipient committee, so that feature does not distinguish Q from the rest of the Item. What distinguishes Q is its geography, which the enacted language fixes at "the upper portions of the Eastern Virginia Groundwater Management Area."

At the August 20 hearing this appropriation was described from the dais as money "to establish the groundwater monitoring stations in Northern Virginia," with the observation "And there are none," and the Director assented.[137] Both descriptions can be reconciled if "Northern Virginia" means the northern end of the Coastal Plain, which is what the enacted language says and what the Director's own rock-and-sediment answer ninety seconds later confirms. The money densifies observation inside the managed area.

The recharge study. Item 366, paragraph O appropriates $300,000 in the first year and $200,000 in the second, and its scope is fixed by the enacted text rather than by inference:

> "for the Department of Environmental Quality, in consultation with Virginia Tech, to evaluate the feasibility and cost of aquifer recharge at wastewater treatment facilities **in the Eastern Virginia Groundwater Management Area** in addition to those facilities already included in the Hampton Roads Sanitation District's Sustainable Water Initiative for Tomorrow (SWIFT) project, **as well as an assessment of other beneficial uses of treated wastewater such as for cooling, irrigation, industry, or other gray water uses.** The analysis shall be provided to the Chairs of the State Water Commission, House Committee on Agriculture, Chesapeake, and Natural Resources, and Senate Committee on Agriculture, Conservation, and Natural Resources by July 1, 2027."[138]

Two things follow, and the second is the one worth marking.

The study cannot look west, because the appropriation does not authorize it to. The Director's oral description of the target areas as "Fredericksburg area, Fairfax area," and his identification of the Noman M. Cole, Jr. facility in Lorton as "a great location … on the upper part of the of the system," are consistent with the enacted language and corroborate it.[139][140] The Fairfax facility is east of Interstate 95. The county has renamed it from Pollution Control Plant to Water Recycling Facility, and it treats more than 40 percent of the county's wastewater.[141]

And this is a cooling study as well as a recharge study. Paragraph O directs an assessment of "other beneficial uses of treated wastewater such as **for cooling**." Section 8.1 establishes that Loudoun Water delivered more than 750 million gallons of reclaimed water to all customers in 2025 and served 40 data centers from that system, and Section 8.1 establishes that DEQ permits only two utilities in the Commonwealth to supply reclaimed water for evaporative cooling. The Commonwealth has funded an evaluation of reclaimed water for cooling, and bounded it to the area where the fewest data centers are.

The western study. Immediately after telling Delegate Hodges that Loudoun is rock rather than sediment, the Director turned to the one instrument that does look west:

> "So we have a different study that authorized as well on that one that's under Senator Perry and Senator Delegate McAuliffe. And that contract is we've got the bids in, and we're negotiating with two of the. They've selected two top contenders, and they're in the negotiation process with the purchasing people. That takes too long, in my opinion. But I'm just a private sector guy."[142]

Delegate McAuliff added that the area "goes all the way up to my district" and that coverage there "is very thin," which he identified as "one of the concerns."[143]

That study is Item 366, paragraph N. DEQ "shall study the threats and challenges to the groundwater supply in western Loudoun and Fauquier Counties," and among five enumerated tasks shall "evaluate whether a groundwater management area should be established for the region pursuant to Chapter 25 (§ 62.1-254 et seq.) of Title 62.1 of the Code of Virginia." The Department "shall complete its meetings by November 30, 2026," and shall report to the chairs of the House Committee on Agriculture, Chesapeake and Natural Resources and the Senate Committee on Agriculture, Conservation and Natural Resources "no later than December 31, 2026." The appropriation is $200,000 in the first year.[144]

The finding. On August 20, 2026, the contract for a study required to report on December 31, 2026 had not been signed, and two finalists remained in procurement negotiation. The same appropriation requires a series of meetings to be completed by November 30. The agency head volunteered on the record that the procurement process "takes too long."

Paragraph N is also the only place in Item 366 that contemplates extending groundwater management area status to the corridor where the data centers actually are.

A note on legislative history. House Bill 501, which would have directed this study by statute, was left in the Committee on Rules on February 18, 2026. Its substance was enacted anyway as budget language, which means the study exists at the pleasure of an appropriation act rather than in the Code.[145]

The three appropriations, read against the model boundary.

Instrument	Amount	Where it looks
Monitoring stations, paragraph Q	$1,150,000 first year, carried forward	"the upper portions of the Eastern Virginia Groundwater Management Area"
Recharge siting study, paragraph O	$300,000 and $200,000	Fredericksburg and Fairfax, "the upper part of the of the system"
Groundwater study, paragraph N	$200,000	western Loudoun and Fauquier

Section 7.4 established that the model domain stops at Stafford and the managed area does not. **Two of the three appropriations are aimed at precisely the part of the managed area the model cannot see**, and in that light they are entirely rational. An agency that cannot model north of Stafford, and says so, is buying instruments and studies for exactly that place. The money is well directed at the problem the agency has.

The third is aimed at the place where the load actually is. It received $200,000, a four-month reporting window, and a contract that had not been signed four months before the report was due.

For scale, set those appropriations against the program they sit beside. The Commonwealth's entire local and regional water supply planning grant cycle for fiscal 2026 distributed **$233,720.36** among twenty-three of the twenty-five regional planning areas that applied, which is under ten thousand dollars apiece for the planning instrument Section 15 describes as the one that reaches every locality in Virginia.[146] Paragraph Q's monitoring stations, at $1,150,000 for up to five wells inside the managed area, are nearly five times the statewide planning grant program.

The advisory committee asked for this subject and did not get it. At its meeting of December 16, 2024 the Eastern Virginia Groundwater Management Advisory Committee, by general consensus, "supported the inclusion of specific topics for the group to consider, including the concept of groundwater trading, **data center water use**, and the consideration of agricultural concerns, during future meetings." Two meetings followed in that fiscal year, in March and June of 2025, taking presentations on self-supplied domestic withdrawal and on the Coastal Plain monitoring network.[147] **The request is still unanswered eighteen months later.** DEQ's own updates presentation to the committee on June 17, 2026 runs to water supply planning, the chloride monitoring network, the status of the SJ 25 report, and the sequence by which a drought emergency is declared. Data center water use does not appear in it either.[146] The finding is scoped to the meeting materials this volume has read, which are the 2025 annual report and the four presentations posted for June 17, 2026.

And the committee is eastern by construction, which is nobody's oversight. Its twenty-five members include WestRock, Smithfield Foods, the Hampton Roads Sanitation District, the Hampton Roads and Accomack-Northampton planning district commissions, the cities of Norfolk, Chesapeake and Suffolk, the James City County Service Authority, the King George Service Authority, Mission H2O, the Chesapeake Bay Foundation and the James River Association.[148] No locality west of Interstate 95 is represented, and no data center operator sits on it. That follows from the committee's own charter, which makes it advisory to the management of groundwater "in the Eastern Virginia Groundwater Management Area." The one standing body the Commonwealth convenes on groundwater is constituted for the half of the problem that has a program.

The Commonwealth is not neglecting its groundwater problem. It is funding the problem it can already see, inside a boundary drawn on a highway, while 121 of the 286 facilities in this project's inventory, 42 percent of it, sit in Loudoun County on the other side of that boundary in a province the model was built to exclude.

7.6 The monitoring network, by the numbers

DEQ describes its Groundwater Characterization and Monitoring Program in its own words:

> "It consists of over 440 individual wells. Over 300 wells are operated by DEQ, with the remainder operated by USGS. Of the total, 385 wells are located within the Groundwater Management Areas (GWMAs) of the Virginia Coastal Plain. Within the GWMAs, 164 wells

> are equipped to monitor water levels continuously, in near-real time. ... DEQ and USGS are currently expanding the statewide network, both in the Virginia Coastal Plain and in regions west of I-95."[149]

And on staffing: "Most GCMP staff are assigned to Virginia's Coastal Plain province, where the regulatory Groundwater Management Areas are located." The same page acknowledges the difficulty west of the line: "In these provinces, groundwater occurs mainly in the fractures and joints of the hard rock. Groundwater occurrence, movement, and quality vary significantly with the local geology."[150]

And the network is being densified, in the east. DEQ told the advisory committee in June 2026 that it is expanding the chloride-monitoring network with USGS drilling from June 24, that the first two planned state observation wells bracket the James River SWIFT site north and south, that five existing wells west of that site have been upgraded from periodic to real-time monitoring with three more planned, and that the object is "a perimeter of nine real-time stations to monitor the Potomac Aquifer's response to SWIFT."[146] Nine new real-time stations are being placed around a single injection project inside the management area. The figures below are what the same network provides for the four physiographic provinces outside it.

Author's calculation, and it is a bound rather than a point estimate. DEQ's own phrase is "over 440 individual wells," which is a floor and not a count, while the 385 inside the Coastal Plain management areas is stated exactly. Dividing 385 by 440 therefore gives the largest share the Coastal Plain can hold: **88 percent is an upper bound**, and the **55 wells** covering the Piedmont, Blue Ridge, Valley and Ridge, and Appalachian Plateau provinces combined are a **minimum**. Every well above 440 lowers the eastern share and raises the western remainder, and DEQ publishes no exact network total. That eastern share, whatever its true value, observes a set of areas covering a minority of the Commonwealth's land area. DEQ publishes no province-level breakdown of those 55 on the pages searched.

7.7 Five reasons the eastern model does not transfer

1. **Its western boundary is the Fall Line, treated as impermeable, and justified by the hydraulic conductivity contrast with the Piedmont.** The model asserts the two provinces are hydraulically disjoint.[151]

2. **No storage parameter exists with which to run it.** The most directly relevant Virginia publication was located and its scope determined: Water Supply Paper 2457 treats base-flow characteristics as an indicator of potential *yield* in areas lacking specific-capacity data, and does not report aquifer storage.[152] The Bedford County model is steady state and therefore assigns no storage term at all. USGS says what a transient version would require: "The model could be modified to simulate transient conditions with varying recharge, but this would necessitate the specification of values for specific yield in the model. Continuous water-level monitoring for periods of 3 or more years at multiple wells could supply the required information to estimate this model parameter."[153] A published Virginia crystalline-rock specific yield or storage coefficient is not present in that report and was not located elsewhere in the USGS Publications Warehouse as searched on August 23, 2026. The only western Virginia value found anywhere is the karst figure of approximately 0.01 in Clarke County.

3. **The medium assumption fails.** The model's formulation presumes Darcian flow through a laterally continuous, layered porous medium. Karst conduits discharge at points rather than along lines. Crystalline drawdown elongates along fracture strike. Horizontal hydraulic conductivity spans more than two orders of magnitude inside the single county USGS modelled, from 0.04 to 8.6 feet per day, and transmissivity spans a comparable range, from 7 to 800 square feet per day. The model handled the spread by specifying a uniform value and accepting the consequences.[154]

4. **The process being predicted is different.** East of the line the quantity of interest is depressurization plus irreversible aquitard compaction on a decadal to century timescale, and Circular 1392 notes that "compaction can continue for many years or decades after groundwater levels drop."[155] West of the line the quantity of interest is annual recharge against minimal storage on a seasonal timescale. USGS says so directly of the one Valley and Ridge county it studied: "the amount of water that recharges the groundwater system each year is critical." That sentence is written about karst. The crystalline half of the west reaches the same place by a different route, set out at Section 6.2: storage sits in a thin regolith mantle above bedrock whose porosity runs from 0.01 to 2 percent, and recharge runs at a Bedford model mean of 9.4 inches per year against a three-province base-flow median of 8.32.[156] A fifty-year head-decline projection answers the eastern question and largely misses the western one.

5. **The calibration data are not comparable.** Seven thousand one hundred eighty-three observations from 497 wells at a root mean square error of 3.6 feet, against a single-county steady-state model with a standard error of 45.6 feet whose authors state that "at the regional scale, data are also insufficient to define discrete fracture heterogeneities which may supply water at depth."[157] Pumping in that model accounts for 0.2 percent of total groundwater outflow. It was not built to answer a withdrawal-impact question.

The scoped negative, stated carefully. No calibrated predictive groundwater flow model for the Piedmont, Blue Ridge, or Valley and Ridge provinces comparable to the Virginia Coastal Plain model is present in the DEQ pages searched as of August 23, 2026, comprising the water withdrawal, groundwater withdrawal, water quantity, groundwater characterization and monitoring, water supply planning, water withdrawal reporting, agricultural water use, and Eastern Virginia Groundwater Management Advisory Committee pages. The nearest item DEQ points to is the single-county USGS product it co-authored.

That negative is narrower than it first appears, and Section 7.8 sets out what does exist. The claim is about a Commonwealth instrument of the kind used to decide permits. It is not a claim that nobody has assessed western groundwater.

7.8 The assessments the Commonwealth did not make

Two substantial hydrogeologic assessments of the western counties exist. Neither was produced by the agency that would use one, and neither is a predictive flow model. Both bear directly on the argument.

Fauquier County, with USGS, since 1983. The Fauquier County Groundwater Resource Assessment and Monitoring Study is a county cooperative with the United States Geological Survey. USGS describes the county as spanning three geologic provinces, the Blue Ridge, the

Culpeper Basin and the Piedmont, and states the stakes plainly: "All 3.9 Mgal/day of public and private water supplies in Fauquier County are extracted from aquifers by groundwater wells tapping unique rocks in each of the three provinces." The stated purpose is to build "surface-water and groundwater monitoring networks … to address questions regarding water-level declines, contributing areas to wells, interconnection of pumping wells, and interactions with streams."[158]

A county drawing all of its public and private supply from groundwater has been assessing its own aquifers with federal help for four decades, in a province where the Commonwealth issues no withdrawal permit at any volume.

Loudoun County, by its residents, in 2025. In August 2025 the Agriculture Work Group of the Loudoun County Preservation and Conservation Coalition published *Assessment of the Groundwater Supply in Loudoun County, Virginia*. The lead author is a hydrogeologist with more than forty years of experience with Loudoun groundwater and a former county employee; the co-author is a water resources engineer; the effort was initiated by a member of the county Farm Bureau who has farmed in Loudoun for fifty years.[159]

Its conclusion, verbatim:

> "This report describes and provides scientifically defensible evidence that groundwater resources in Loudoun County are being significantly depleted by continued growth, that there have been periods of significant drought which are anticipated to worsen in magnitude and frequency, and that groundwater as a water supply is no longer sustainable. … Groundwater resources in Loudoun County cannot be sustained under existing practices, monitoring, management, and planning."[160]

What it establishes on the record, and what it does not.

The well population is large and largely unobserved. The assessment counts **more than 19,000 active wells** in the county. Drilling ran at roughly 300 wells per year between 1977 and 1999, rose to approximately 800 per year between 1999 and 2007, and fell to about 200 per year thereafter.[161] Section 3.1 established that none of these wells is registered with DEQ, because registration attaches only inside a declared management area.

The observation network against that population is fourteen county wells, plus three USGS wells in the vicinity with records running to the late 1960s.[162] The trends the assessment reports from the USGS wells are modest and mixed: the Short Hill well, away from development, shows no trend; the Leesburg well is declining about **three feet per decade**; the Bull Run well, which is in Prince William County just over the line, about **one foot per decade**. From thirteen years of the county's own data the authors compute an average decline of **0.6 feet** for western Loudoun wells not affected by nearby pumping and not in karst conglomerate.

Recharge is thin, consistent with Section 6.2. The assessment gives typical precipitation of about 41 inches against a general recharge rate of less than 11 inches per year.

And one finding is about the county's own reporting rather than its water. The assessment notes that Loudoun publishes Annual Water Resources Monitoring Data Reports and

that "none of the reports make any mention of water level trends."[163] The data were being collected and published. The trend was not being stated.

Three limits this volume states rather than glosses. The assessment is a coalition product prepared by qualified authors from county, state and federal data; it is not an agency study and it has not been through peer review. It is an assessment rather than a calibrated predictive model, and it does not do what the Virginia Coastal Plain model does. And a countywide decline inferred from three long-record USGS wells, one of which sits in an adjoining county, rests on a thin observational base, which is itself the condition the assessment is complaining about.

The assessment describes the regulatory position in the same terms this volume does. Its own summary of state oversight: "Loudoun is not part of a designated Groundwater Management Area (GWMA), so Virginia DEQ permits are not required for most withdrawals here."[164]

And it recommends the remedy. The coalition's action plan, in progress at the time of writing, contemplates "creation of a state-authorized groundwater management area."[165] Section 13.5 sets out the mechanism, who may invoke it, and why the recommendation is addressed to the county rather than to DEQ.

8. Where the Water Actually Comes From

Northern Virginia data centers are utility retail customers. Almost without exception they buy finished water from Loudoun Water, Fairfax Water, or Prince William Water, and those three utilities draw from two surface sources: the Potomac River and the Occoquan Reservoir. Groundwater is nearly absent from the picture, and Sections 3 and 5 explain why the absence carries no information.

This section establishes the plumbing, because a great deal of argument about data center water in Virginia proceeds without it.

8.1 Loudoun Water

The supply portfolio has four parts. Fifty million gallons per day of contract capacity at Fairfax Water, unchanged across fiscal years 2016 through 2025. Twenty million gallons per day of treatment capacity at the utility's own Trap Rock facility in Leesburg. The Goose Creek plant, at 7 million gallons per day, decommissioned in 2023. And the Milestone Reservoir, a retired Luck Stone trap rock quarry described by the utility as holding "at least one billion gallons" initially and "more than 8 billion gallons" as further quarries are acquired.[166] Loudoun Water's Potomac River intake was permitted by DEQ in November 2012 at 40 million gallons per day, of which up to 20 was to serve Loudoun Water's own demand.[167]

The Interstate Commission on the Potomac River Basin puts a figure on the dependence: "Fairfax Water has supplied 61 percent of Loudoun Water's demand."[168]

The quarry exists to move withdrawal away from low-flow periods. In the utility's words: "Because the system proactively withdraws and stores river water during normal flow, we will suspend direct water withdraws from the Potomac River during water supply emergencies. During water supply emergencies we'll use banked water from the quarry, not water from the Potomac River."[169]

Two internal inconsistencies to flag rather than smooth. The utility's facilities page dates Trap Rock's opening to May 2019; its fiscal 2025 annual comprehensive financial report puts the plant in service in 2018. And the figure of 90 million gallons per day appears on one Loudoun Water page as projected 2040 demand and on another, the data center page, as "Permitted Water Capacity for Future." Those are different quantities. Neither figure should be cited without stating which document it comes from.[170]

The reclaimed water system. This is the arrangement that distinguishes Loudoun from every other data center jurisdiction in Virginia, and the utility describes its origin without ambiguity:

> "In 2010 Loudoun Water constructed the first pipelines of the reclaimed water distribution system to supply irrigation and industrial cooling water to Loudoun County's rapidly growing data center industry. The reclaimed water distribution system has since expanded to 20 miles of pipeline. In 2025, Loudoun Water delivered more than 750 million gallons of reclaimed water to customers, helping to save an equal amount of potable drinking water while reducing nutrients discharged to the Potomac River and Chesapeake Bay."[171]

The source is the Broad Run Water Reclamation Facility, opened in 2008, currently treating about 10 million gallons per day against a capacity of 16.5, of which about 2 million gallons per day returns to customers as reclaimed water. Treatment includes ultrafiltration and ultraviolet disinfection, and the plant operates under the Dulles Area Watershed Policy.[172] The product is held to Level 1 standards, the Virginia designation permitting unrestricted non-potable urban use.[173]

The rate is the policy. Effective January 1, 2026, Loudoun Water charges $2.07 per thousand gallons for reclaimed water against $4.42 for multifamily and commercial Tier 1, $7.59 for Tier 2, and $9.34 for non-potable and irrigation use in the "All Other Uses" class.[174] **Author's calculation:** reclaimed water is priced at 47 percent of the commercial Tier 1 rate and 27 percent of Tier 2.

The utility retains complete discretion over who connects:

> "Reclaimed water supply availability and hydraulic constraints may limit or exclude proposed connections that are not in alignment with Loudoun Water's program goals. Capacity allocations and construction permits for reclaimed water connections are made in Loudoun Water sole discretion."[175]

And the arrangement is nearly unique in the Commonwealth. JLARC records that "DEQ currently permits only two water utilities, including Loudoun Water, to provide reclaimed water for evaporative cooling uses."[176]

What Loudoun Water publishes about data centers. For calendar 2025 in its central service area: 206 data centers, of which 88 are air cooled, 78 are cooled with potable water, and 40 with reclaimed. Systemwide average day demand of 29.0 million gallons per day, of which data centers account for 2.6, or 9.0 percent. Systemwide maximum day of 50.0 million gallons per day, of which data centers account for 8.0, or 16.0 percent. Reclaimed water to data centers, 2.0 million gallons per day.[177]

Author's calculation, and it is the load-bearing number in this section. Data center demand moves from 2.6 to 8.0 million gallons per day between average and maximum day, a factor of 3.1. Systemwide demand moves from 29.0 to 50.0, a factor of 1.7. Data center load is disproportionately a peak-day problem, and peak day in Northern Virginia falls in summer, when river flows are lowest and irrigation demand is highest.

A note on how these figures are published. They appear only as infographic images on a single web page. They are invisible to text search and to any automated scan of the utility's corpus. Publication is voluntary, and Section 8.2 shows what the alternative looks like. A named list of reclaimed water customers is not present in the published loudounwater.org corpus as of August 24, 2026, across the reclaimed water program, water reclamation, facilities, rates, data center, and service agreement pages. Obtaining names would require a records request, and the utility links its own such page from the data center page.

8.2 Fairfax Water, and the permit that does not exist

Fairfax Water operates the Corbalis plant on the Potomac at Herndon, rated at 225 million gallons per day, and the Griffith plant on the Occoquan Reservoir at Lorton, rated at 120. Calendar 2024 actual withdrawals were 94.6 and 69.4 million gallons per day respectively.

The same DEQ report gives Fairfax County a smaller number than Fairfax Water's own two intakes. Table 20 carries Corbalis at 94.6 and Griffith at 69.4 for calendar 2024, totalling **164.0** million gallons per day. Table 21 of the same report, giving 2024 withdrawals by locality excluding power generation, carries Fairfax County at **70.47**. The utility's own intakes are **2.33 times** the county line in the table that would appear to contain them. Table 20 reports at the withdrawal facility; Table 21 reports a locality aggregate, and the report does not state what that aggregate includes or excludes beyond power generation. One arithmetic observation is recorded here. 164.0 less 70.47 is 93.53, and Corbalis alone is 94.6, so the county line sits within about one million gallons a day of Griffith taken by itself. That is consistent with Table 21 omitting the Potomac withdrawal, and it is consistent with other compilations too. **The October 2024 edition of the same DEQ series closes the gap.** That edition reports calendar 2023, and its Table 21 gives Fairfax County **86.86** million gallons a day of surface water against Corbalis at **86.2** in its Table 5, and gives Prince William County **69.74** against Griffith at **67.9**, the Occoquan plant sitting in the county that holds the reservoir. In the December 2025 edition, reporting calendar 2024, Griffith is attributed to Fairfax, Prince William's surface figure falls to **2.15**, and Corbalis appears in no locality's row at all. Fairfax falls from 86.86 to 70.08 while gaining a plant, because it lost a larger one. Each edition reconciles to its own statewide total, so neither is internally in error, and the consequence is that Table 21 will not support a comparison of a locality against itself across editions. A withdrawal of 69 million gallons a day changed counties and a withdrawal of 95 million gallons a day left the table. **Why Corbalis is absent is still not resolved here.** DEQ describes Table 21 only as withdrawals within localities excluding power generation, states no rule for what else it omits, and this volume declines to infer one. Both editions were read from the source documents on August 26, 2026, one day after this volume's evidence snapshot.[178] The system serves roughly 2.2 million people through more than 4,000 miles of main.[179]

Neither intake holds a withdrawal permit. No Virginia Water Protection permit for either Fairfax Water intake is present in the corpora searched as of August 24, 2026, comprising deq.virginia.gov, the DEQ environmental data mapping application's VWP individual permit layer, law.lis.virginia.gov, townhall.virginia.gov, rga.lis.virginia.gov, potomacriver.org, fairfaxwater.org, and the Maryland State Archives and Maryland Department of the Environment.

The reason is statutory:

> "Notwithstanding any other provision of law, no Virginia Water Protection Permit shall be required for any water withdrawal in existence on July 1, 1989; however, a permit shall be required if a new § 401 certification is required to increase a withdrawal."[180]

The implementing regulation asks grandfathered operators for information and then disclaims any effect from receiving it: "Each owner or operator of a permanent surface water withdrawal system engaging in a withdrawal that is subject to this exclusion shall provide DEQ the estimated maximum capacity of the intake structure. ... The information provided to DEQ shall not constitute a limit on the exempted withdrawal."[181]

Anyone who writes that Fairfax Water is permitted to withdraw a given quantity is describing a plant rather than a permit. What actually constrains the withdrawal is plant hydraulics, the Washington metropolitan drought agreements described at Section 14.6, and DEQ's dormant residual authority to order a grandfathered user to cease and apply if impairment occurs.[182]

The last device anyone attached to this intake was a flow restrictor, and the Supreme Court voided it.

For four decades Maryland permitted Virginia's Potomac withdrawals, on the theory that it owns the riverbed to the low-water mark on the Virginia shore under the Black-Jenkins Award of 1877. Fairfax County was the first Virginia municipal corporation to apply, in 1956, seeking leave to withdraw up to 15 million gallons per day; Maryland granted it in 1957. Between 1957 and 1996 Maryland issued at least 29 water withdrawal permits to Virginia entities without objection.[183]

In 1996 the Fairfax County Water Authority applied to build an intake structure extending 725 feet from the Virginia shore. The Maryland Department of the Environment refused the permit in late 1997, the first such denial ever issued to a Virginia entity, on the ground that Virginia had not demonstrated sufficient need. Several Maryland officials had argued the structure "would harm Maryland's interests by facilitating urban sprawl in Virginia." Virginia sought leave to file a bill of complaint in the Supreme Court in February 2000. Maryland eventually issued the permit on January 24, 2001, but only after its legislature attached a condition "requiring FCWA to place a permanent flow restrictor on the intake pipe to limit the amount of water that could be withdrawn from the River."[184]

The Court held for Virginia on December 9, 2003. The decree contains five numbered paragraphs; the two that bear on this volume read:

> "2. Virginia, its governmental subdivisions, and its citizens may withdraw water from the Potomac River and construct improvements appurtenant to the Virginia shore of the Potomac River free of regulation by Maryland.
>
> 3. Any conditions attached to the construction/water appropriation permit granted by Maryland to the Fairfax County Water Authority on January 24, 2001, are null and void and the State of Maryland is enjoined from enforcing them."[185]

On the merits the Court concluded that "the Black-Jenkins Award gives Virginia sovereign authority, free from regulation by Maryland, to build improvements appurtenant to her shore and to withdraw water from the River, subject to the constraints of federal common law and the Award."[186]

The physical device intended to cap withdrawal from this intake was struck by name, and its author enjoined. The intake is Corbalis, and Corbalis is where Loudoun County and western Prince William County get the water that cools their data centers.

One further passage, from the acquiescence analysis. Maryland argued that Virginia had forfeited its rights by long silence. Among the evidence it offered was Virginia's own regulatory posture, which the Court addressed in a footnote: "Maryland's evidence that Virginia has never operated a permitting system for water withdrawal or waterway construction is insufficient to

satisfy Maryland's burden."[187] The Court disposed of the argument without disputing the characterization on which it rested. Maryland's description of Virginia's practice is consistent with the pre-1989 exclusion at Va. Code § 62.1-44.15:22(B) and with the unpermitted-withdrawal figures set out below, and the volume treats it as Maryland's characterization in a litigation record rather than as a finding of the Court.

A figure to handle carefully. A Fairfax County capital improvement document from approximately 2000 records a Maryland permit for an average Potomac withdrawal of 100 million gallons per day and a maximum of 150.[188] That is a later instrument than the 15 million gallon per day permit of 1957 and is not the January 24, 2001 permit whose conditions the Court voided. This volume does not reconcile the three, and no figure from that capital improvement document should be described as a currently operative cap.

The contrast with Loudoun Water is instructive. A new intake requires a permit, and Loudoun's 2012 Potomac intake got one at 40 million gallons per day. A withdrawal that predates July 1, 1989 does not, and never will.

This is not an outlier. DEQ's most recent annual report states that "In 2024, unpermitted withdrawals represented approximately 78% of the total reported withdrawals in Virginia when excluding power generation," and that "81% (916.16 MGD) of 2024 reported surface water withdrawals were associated with unpermitted facilities."[189] The prior year's report put the equivalent 2023 figure at 73 percent and recorded that twelve of the twenty largest reported withdrawals were unpermitted.[190] Roughly one gallon in five of non-power surface withdrawal in Virginia moves through a Virginia Water Protection permit.

All the growth is on the river. Fairfax Water's adopted 2026 budget gives sources of supply as daily averages: Occoquan at 65.4 million gallons per day in 2021 and 63.0 budgeted for 2026; the Potomac at 87.0 in 2021 and 98.7 budgeted for 2026; the Washington Aqueduct declining from 12.6 to 10.9. System totals move from 165.0 to 172.6.[191] **Author's calculation:** the entire net increase of 7.6 million gallons per day, and more, comes from the Potomac. The Occoquan is not merely flat. Calendar 2024 withdrawal at Griffith was 69.4 million gallons per day against a safe yield last publicly stated as "about 65 million gallons per day" in a document from approximately 2000, which is to say the reservoir was drawn above its last published safe yield. This volume does not treat a quarter-century-old figure as current, and no more recent safe yield for the Occoquan was located; the point is that Fairfax Water publishes no Occoquan safe yield against which its own withdrawals can be checked. **This volume does not assert that the reservoir was drawn above its safe yield.** The only figure of that kind encountered sits in a document the volume was unable to identify by title, date or page, and it is reported as an encounter rather than as a benchmark.[192]

The Occoquan is additionally constrained by treatment. Capital project 2789, a powdered activated carbon system at Griffith for PFAS, carries $26,000,000 and a 2027 target.[193] The long-term answer is the Steven T. Edgemon Reservoir in a Vulcan quarry, at 1.7 billion gallons in its first phase and up to 17 billion ultimately. Fairfax Water's financial report says the land becomes available in 2035; ICPRB puts Phase 1 operational in 2040.[194]

Wholesale. Fairfax Water declines to publish wholesale rates, stating that "Wholesale customers pay rates established by individual contract." Its eight wholesale customers are Loudoun Water, the Metropolitan Washington Airports Authority at Dulles, Prince William Water, the towns of Herndon and Vienna, the United States Government at Fort Belvoir, and the Alexandria and Prince William districts of Virginia American Water. Each "reserved a specified capacity in Fairfax Water's system for their use."[195] Wholesale accounts for approximately 47 percent of total water sales volume in 2026.[196]

Author's calculation from the adopted budget. Dividing budgeted revenue by budgeted volume gives implied commodity rates per thousand gallons: Prince William Water at $2.29 on 10,000 million gallons, Loudoun Water at $1.48 on 6,800 million gallons, and retail customers at $5.30 on 29,900 million gallons.[197] These are derived figures, not quoted rates. They fall into four clean tiers across the eight customers, which is consistent with their being the actual contract commodity rates, but they should be labelled as derived wherever used. Loudoun Water carries the lowest implied commodity rate on the system, consistent with having pre-purchased large capacity, and holds $66,547,000 in current and $226,728,000 in long-term Fairfax Water agreement obligations.[198]

Fairfax Water publishes no data center figure. No quantity, percentage, or count attributable to its system is present in its *Strategic Plan 2030*, its *2026 Annual Budget* (in which the phrase "data center" does not appear), its news page for March through July 2026, or the 28 board agendas and minutes from November 6, 2025 through July 23, 2026, all searched as of August 24, 2026.

The board record shows that the number exists. From the minutes of the December 11, 2025 budget public hearing: "Ms. Diana Artemis of Falls Church submitted a written question seeking information about how Fairfax Water is impacted by data center demands for water. ... Mr. Prelewicz provided a brief overview of how Fairfax Water is currently tracking data center water usage."[199] From the March 5, 2026 work session: "Dr. Seck presented on existing and projected data center water use and consumptive use within the basin." The slides were not posted.[200]

The tracking exists. The number has not entered the public record.

And the utility is on record opposing disclosure-adjacent legislation. From the minutes of June 18, 2026, discussing the 2026 budget's reclaimed water provisions: "The budget version removes the negotiated Occoquan carve-out and applies the reclaimed water requirement to new data centers beyond only those receiving grant funding. Ms. Hedges noted she is coordinating ... on strategies to communicate Fairfax Water's opposition to its inclusion in the budget."[201]

One further feature of the Occoquan worth stating. The Upper Occoquan Service Authority, rated at 54 million gallons per day, discharges to the reservoir Fairfax Water draws from. In UOSA's own words, its output "supplies roughly 20% of the inflow into the Occoquan Reservoir. ... During drought periods the plant may briefly provide up to 90% of the reservoir inflow."[202] Indirect potable reuse has been the operating reality on the Occoquan since the State Water Control Board's Occoquan Policy of 1971.

8.3 Prince William Water

Prince William Water is a purchaser with almost no supply of its own. Its fiscal 2025 report gives 62.4 million gallons per day of reserved capacity at Fairfax Water, 5.0 million gallons per day contracted from the City of Manassas at Lake Manassas, and 0.4 million gallons per day from its own wells in the Bull Run Mountains.[203] **Author's calculation:** the Fairfax Water contract is approximately 92 percent of the portfolio.

Actual purchases are reported only in dollars: $18.6 million to Fairfax Water and $2.3 million to the City of Manassas in fiscal 2025. Volumetric deliveries are not present in the fiscal 2025 report or the fiscal 2027 through 2031 capital program as of August 23, 2026.[204]

A risk on the Manassas contract, from press. Potomac Local News reported on October 23, 2024 that DEQ "has initiated a review of the city's water withdrawal permits from Lake Manassas," evaluating whether to rescind grandfathered rights, and quoted the interim city manager saying a loss of capacity would have "a dramatic negative impact."[205] **Labelled as press.** No DEQ or City primary document on this review was retrievable as of August 23, 2026. If the grandfathered rights fall, Prince William Water's 5.0 million gallons per day is exposed.

Reclaimed water was studied and declined. This is the cleanest negative finding in the section and it is documented three ways.

The consultant recommended against it. A December 16, 2024 briefing to the county's Sustainability Commission by the utility's deputy general manager carried the bullets: "Feasible from a regulatory perspective, but will require significant coordination with UOSA"; "Limited revenue potential from a highly-variable waste stream from the Digital Gateway"; and "Currently, BC sees limited value in pursuing a water reuse option for the Digital Gateway."[206]

The utility confirmed it publicly: "As part of the Master Plan Addendum, Prince William Water explored the feasibility of a water re-use program for the Digital Gateway. While the study did not indicate that water re-use is viable for the Digital Gateway, this does not preclude considering water re-use for other projects."[207]

And nothing appears in the capital program. A text search of the fiscal 2027 through 2031 capital improvement program, approved May 14, 2026, across all 84 project data sheets, returns zero occurrences of "reclaimed water," "reuse," or "recycl."[208]

The geography explains part of it. The H.L. Mooney Advanced Water Reclamation Facility, at 24.0 million gallons per day, sits in Woodbridge and discharges to Neabsco Creek and thence the Potomac. It is on the opposite side of the county from the western data center corridor, whose wastewater goes to UOSA. Mooney's largest capital line, at $205,542,000, is odor control, clarifiers, ultraviolet disinfection, headworks and solids handling.[209]

Demand trend. Data centers were 25 facilities at 1.5 percent of average day and 3.9 percent of maximum day in November 2021; 47 at 1.4 and 6.0 percent in 2023; and approximately 55 at 3.8 and 10.1 percent in calendar 2025.[210] The county's own overlay district guidance gives per-building figures: "the average daily water consumption of a single data center building is about 18,000 gallons per day while the maximum day consumption of a single data center building is about 88,000 gallons per day."[211] **Author's calculation:** that is a maximum-to-average ratio of 4.9 per building, consistent in direction with the Loudoun systemwide figure of 3.1.

The supply increment has no money against it. Capital project REG-5 reads: "Purchase an additional 10 MGD supply from Fairfax Water based on future demands." Estimate type: order of magnitude. Programmed spending: zero through fiscal 2029, $100,000 in fiscal 2030, zero in fiscal 2031.[212] The county's stated path to more water is a purchase with no real money behind it in the five-year program.

Rate classes. Residential and Commercial and Industrial. There is no reclaimed water class and no data center class. Data centers pay the same unit rates as any commercial customer under a stated policy of "growth pays for growth."[213] Two of the utility's top four customers by revenue in fiscal 2025 are data center entities, neither of which was a customer in 2016.[214]

8.4 Fauquier County

Fauquier is the only county in this volume whose public water supply comes out of fractured bedrock, and it lies entirely outside any declared groundwater management area. It is therefore the place where the territorial exemption is tested against a real system under real stress, and where the consequences fall on households rather than on data centers.

8.4.1 The system

The Fauquier County Water and Sanitation Authority runs sixteen water systems and three wastewater plants on **about fifty wells**, its own figure.[215] It serves 7,310 water connections through 146 miles of main with 5.95 million gallons of storage.[216]

Reported daily average consumption is 1.64 million gallons per day in one table and 472,328,471 gallons annually in another. **Author's calculation:** the second figure divided by 365 gives 1.29 million gallons per day. The report does not reconcile the two. Cite 1.64 as reported and 1.29 as derived.

Five supply figures circulate for Fauquier, and they are not competitors. Each measures a different universe over a different window, and this volume records all five rather than choosing among them. **1.64** is the Authority's reported daily average consumption for fiscal 2025 and **1.29** is the same report's annual total divided by 365; both cover the Authority's sixteen systems only. **1.76** is county-wide public supply on the USGS 2015 estimate, a larger universe than the Authority because it includes the Town of Warrenton's separate system. **4.32** is total county groundwater withdrawal for all uses in that same 2015 estimate, of which public supply is one category and private domestic self-supply at 2.51 is the largest. **3.9** is the figure USGS carries on the Fauquier cooperative's project page for public and private supply combined, attributed there to Maupin and others, 2014, and therefore resting on an earlier compilation than the 2015 estimate. The last two describe substantially the same universe and differ by vintage and by compilation; they are reported side by side and are never netted or averaged. Where this volume writes "Fauquier's public supply" without qualification it means the Authority's own systems, at 1.64 reported against 1.29 derived.[217] The same report carries the note that its tables have "been restated in prior years per new information provided to management," and total consumption for fiscal 2024 reads 444,834 thousand gallons in the fiscal 2024 report and 460,955 in the fiscal 2025 one.

A system-wide permitted or rated capacity figure is not present in the authority's fiscal 2025 annual financial report, its fiscal 2026 or fiscal 2027 adopted budgets, its drought page, or the water quality reports retrieved, as of August 25, 2026. Its wells are permitted individually by the Department of Health, consistent with Section 3.2. Section 8.4.5 returns to this absence, which is not a curiosity.

Correcting a common premise. Lake Brittle, Airlie Reservoir and the Warrenton Reservoir are not Authority sources. Airlie and the Warrenton Reservoir belong to the Town of Warrenton; Lake Brittle is a Department of Wildlife Resources fishing lake.

8.4.2 What the rock yields, and one pumping test that separates the three numbers

Fauquier spans three provinces, and its wells are not in the productive one.

The Culpeper Basin, the belt of Triassic and Jurassic sedimentary rock and diabase running through the county's east, is comparatively generous where the sediments are right. USGS mapping gives siltstone a transmissivity of 1,000 to 2,000 square feet per day and a median yield of 140 gallons per minute in wells of 500 feet or more; sandstone runs 250 to 500 square feet per day and a median of 12 gallons per minute in wells of 250 feet or less. The diabase and its baked contact aureole are the opposite case, described as relatively impermeable and as the poorest aquifers in the basin, with dry holes common.[218]

The county's wells are mostly not in the basin at all. Of Fauquier's 379 groundwater sites in the national inventory, 272 carry a depth; the median is **262 feet** and the range runs from 25 to 1,200. Where an aquifer is coded, the county is dominated by Blue Ridge crystalline rock: 43 sites in the Catoctin Formation at a median depth of 350 feet and 27 in the Marshall Formation at 305, against sixteen for the Newark Group, Balls Bluff, Bull Run and diabase combined. Exactly one Fauquier site is coded to diabase.[219]

The single most useful document in the county's water record is a pumping test on three public supply wells, and it separates permitted from rated from actual inside four pages. The consultant's 2016 hydrogeologic report on the Stafford Farm site describes Catoctin greenstone as poorly fractured and having a massive appearance, and returns **specific capacities of 0.07 to 0.12 gallons per minute per foot of drawdown**. Well STA-3 yielded 62 gallons per minute on airlift, held 43 on a 74-hour constant-rate test, and was recommended at 43 gallons per minute on a twelve-hour daily duty cycle. That last qualification is the whole point. Forty-three gallons per minute for twelve hours is about **31,000 gallons per day**, not the 61,900 that the same rate implies over twenty-four. Well STA-4 is the miniature version: 20 gallons per minute on airlift, reduced to 15 within the first hour of the long test.[220]

Recharge is the other half of the arithmetic. USGS estimates mean annual recharge at 8.1 inches for the Blue Ridge, 8.0 for the western Piedmont and 5.3 for the Mesozoic basins, and gives the 2001 drought year at 3.2, 3.1 and 2.2 respectively.[221] A drought does not reduce recharge at the margin in this system. It cuts it by about sixty percent.

One line from the same consultant's report is worth preserving for Section 9. A contaminated well at the site was offered as usable for "irrigation, fire flow, cooling towers, washing of trucks."

The county's own consultant treated cooling towers as an ordinary destination for water too poor to drink.

8.4.3 The largest user in the county has neither a utility nor a regulator

Public supply is not the main event in Fauquier. USGS puts county groundwater withdrawal at 4.32 million gallons per day in 2015, of which public supply is 1.76 serving 26,229 people and **private domestic self-supply is 2.51 serving 31,328**. That 1.76 is county-wide public supply on a 2015 estimate and covers more than the Authority does, whose own sixteen systems report 1.64 for fiscal 2025; Section 8.4.1 sets the figures side by side. USGS calls it "the largest categorical use of groundwater in the county."[222]

The county's own count is on a different basis and should be reported alongside rather than instead: 14,425 dwellings outside the Service Districts, estimated at about 39,669 people, derived from 2009 address points multiplied by a persons-per-household figure taken from the 2000 Census.[223] The county reached for address points only after cataloging 4,080 historical Health Department well logs and finding them "incomplete in scope and reliability." So 14,425 is an address-point proxy. It is not a well inventory and it is not a household count.

Either way, the county's largest single category of groundwater use sits outside every instrument in this volume. There is no permit because Fauquier is outside the management areas. There is no utility. There is no reporting duty, because a domestic well is below every threshold in Section 4. And there is no local authority either, which the county states in its own drought plan:

> "Individual private wells were not covered in the drought provisions in the 2011 Fauquier County Regional Water Supply Plan. The Commonwealth of Virginia does not grant counties a lot of latitude in managing and regulating private groundwater wells."[224]

The Authority says the same on its drought page: it does not regulate private wells.

And the wells are failing. No dry-well count is present in the county, Health Department or state publications searched as of August 25, 2026, and the county routes well information through the Freedom of Information Act. What does exist is an administrative response that only makes sense if failures are running above what the ordinary process can absorb. On **July 29, 2026** the county published that the Rappahannock Rapidan Health District would waive both state and local fees for replacement wells, including agricultural ones, and that "during the drought, we are not requiring dry wells to be abandoned, so the replacement fee will be waived regardless of whether the existing well is abandoned."[225] A health district suspending abandonment requirements is the closest thing to a dry-well finding the public record contains.

8.4.4 One monitoring well

Of the county's 379 groundwater sites, 203 carry a water level of any kind, **five were ever continuous recorders, and one still reports**. Only two sites have any measurement after January 1, 2024.[226]

The survivor is well 48U 26, also designated SOW 215, finished at 349.5 feet in the Catoctin Formation, reporting since October 2006. Its annual medians decline at **0.147 feet per year across eighteen complete years**, about 2.6 feet in total. **Author's calculation**, ordinary

least squares on annual medians. It is modest, monotonic, and it is one well in one formation. It should be described that way and not as a county trend.

The four wells that went dark between December 2020 and October 2021 include both of the county's Jurassic-system recorders. **There is now no active continuous water-level record anywhere in the Culpeper Basin portion of Fauquier County.**

Two cautions belong with this. First, well 48U 26 shows a large anomaly beginning in September 2025 and a decline through July 2026 that is more than triple its historical seasonal range, with provisional readings after July 21 that hold at a constant value in a way consistent with either a real plateau or a transducer at a range limit. Cause is not established and this volume does not assert one; the item is listed in Section 18 as a query to the USGS Virginia and West Virginia Water Science Center. Second, the four groundwater indicator wells behind the region's declared status sit in Prince William, Fairfax and Loudoun. **None is in Fauquier.** A related citation trap: the USGS report comparing wells 48U 26 and 49V 1 describes them as regional, and 49V 1 is a Prince William County well.

The county's own August 6, 2026 statement is the sharpest sentence in its record: Fauquier "remains in an overall Drought Warning despite improvements in some areas. Groundwater (well water) levels remain in the Emergency status."[5]

8.4.5 A drought order with no instrument, and a trigger with no number

The Authority imposed mandatory outdoor water restrictions on **June 5, 2026**. They remain in force as of August 25, 2026, unlifted and unescalated. **No Authority statement about them dated later than June 12, 2026 was located**, in the corpus set out in the note, which is seventy-four days before this volume closes. The county did not go quiet in the same way. Fauquier County's own drought page carried an update dated August 6, 2026 recording that the county "remains in an overall Drought Warning despite improvements in some areas" and that "Groundwater (well water) levels remain in the Emergency status." The body that imposed the restrictions has published less about them than the county that did not.[227]

The instrument is a two-page news release. It carries no resolution number, no adopting body, no vote, no effective date, no sunset, no exemption clause and no penalty. No drought, restriction or conservation item appears on any of the seven Authority board agendas posted for 2026. The Authority publishes agendas only, with no minutes and no resolution texts, so the authority under which the order issued cannot be established from the public record.

The trigger cannot be evaluated by anyone outside the Authority. Numeric triggers exist, in the Comprehensive Drought Management and Emergency Preparedness Plan adopted August 11, 2016 and amended December 13, 2018, and every one of them is a percentage of permitted capacity: Normal below 75 percent, Watch at 75 to 85, Warning at 85 to 95, Emergency above 95.[228] Section 8.4.1 records that no permitted capacity figure is published. The ladder is denominated in a quantity the public does not have.

And the declared stage does not match the measures imposed. The Authority declared and has maintained Drought Warning. The five measures it imposed on June 5 are close to verbatim the Plan's **Drought Emergency** actions. The Plan's Warning tier permits lawn

watering one night a week and permits pool replenishment for health and safety; the June order prohibits sprinkler irrigation outright and forbids filling any pool less than three-quarters full. The gap matters because the county's enforcement tier, a Class 4 and then Class 3 misdemeanor under the Drought Ordinance adopted January 10, 2019, engages only at a county Drought Emergency, which has not been declared. The penalties that do exist for Authority customers sit in a 2014 conservation program and are not cited or incorporated in the June order.

This is the definitional problem of Section 5 reproduced one level down. A decision rule turns on a number nobody outside the room can check.

One distinction to preserve rather than correct. Section 15.3 places Fauquier in Northern Piedmont 1, which is right under the regional water supply planning areas of 9VAC25-780-45(B). DEQ's drought evaluation regions are a different scheme, and there Fauquier sits in Northern Virginia. Both statements are true of different instruments and the volume should say which one it means.

8.4.6 The county is buying its way onto the river

Fauquier's capital program is now dominated by getting off its own groundwater, and the driver is a contaminant rather than a yield.

Six of sixteen systems exceed a federal PFAS maximum contaminant level.[229] The Authority's fiscal 2027 adopted budget, approved May 26, 2026, carries a **$75.6 million** five-year PFAS program, funded by **nine percent water and nine percent sewer rate increases in each year from fiscal 2027 through fiscal 2031**, with the water availability fee rising from $11,120 to $19,750 and sewer from $14,000 to $19,250 effective July 1, 2026.[230] The same budget carries the New Baltimore interconnection, as "PFAS Compliance - New Baltimore (1.564 MGD Capacity)," the infrastructure "to connect the New Baltimore Water System to Prince William Water's system," at **$50 million: $10 million in fiscal 2027 and $20 million in each of fiscal 2028 and 2029**. The fiscal 2026 budget carried the same line at $18.24 million over fiscal 2026 through 2030.

The line that matters is the decommissioning line. The same capital program funds "New Baltimore - Decommision Wells after Prince William Interconnection" at **$1,000,000, $500,000 in each of fiscal 2031 and 2032.**[231] This is substitution and not redundancy. The Authority is budgeting to retire groundwater wells in its fastest-growing district and replace them with purchased water from the Potomac chain.

No executed water purchase, capacity or wholesale service agreement between the Authority and Prince William Water is present in Prince William Water's published agenda and minutes corpus, thirty-one agendas from April 2024 to July 2026 and twenty-seven sets of minutes from March 2024 to June 2026, as of August 25, 2026. The only published counterparty statement is a February 12, 2026 progress note that the route is still being refined and rights of entry still negotiated.[232] The likely template is on the record: Prince William Water sold 1.4 million gallons per day of wholesale capacity to Manassas Park in 2008 for $9.87 million, priced on the wholesale rate Fairfax Water charges the Authority plus other charges and costs.[233]

Fauquier also became a water utility owner in April 2026. The Authority purchased the Vint Hill water system for $1,500,000 in cash, serving 384 connections, under State Corporation Commission approval of March 19, 2026, with agreements executed April 20, 2026 and recorded April 29.[234] Before that the Authority had, in its own words, never owned the drinking water system; it was the contract operator for a separate corporate owner. Any statement about the county's exposure to data center water has to be dated on one side or the other of that transaction.

8.4.7 The data center record, and one undefined word

The fiscal 2025 principal customers table lists "Vint Hill Data Center Llc" as a **sewer** customer at 1,978 thousand gallons, 0.59 percent, the ninth largest sewer customer on a system whose largest is the public schools.[235] **Author's calculation:** approximately 5,420 gallons per day. The table carries a data-integrity problem: the identical value of 1,978 appears in the water block at the same rank under the name "Peter Pan Llc," whose principal business the fiscal 2024 report gives as Buckland. That is a distinct Buckland-area account and the two rows should not be merged. The sewer attribution is what the record supports, and no water consumption figure should be asserted from that table.

Fauquier's regulatory lever on data center water is a single word, and the word is undefined. Under the county's planned commercial and industrial development overlay, a data center "using recycled water for cooling" with underground power lines is a principal permitted use; the same use without recycled water requires a special exception.[236] **"Recycled water" is not defined in Article 15 of the zoning ordinance, and Article 9 contains no data center or cooling water performance standard.** The switch between by-right and discretionary review turns on a term the ordinance never defines. The Board of Supervisors data center policy of December 14, 2023 addresses water in three sentences and describes itself as a guide.

A comprehensive fix was initiated five days before this was written. The Planning Commission agenda of **August 20, 2026** carries a resolution to initiate a text amendment to Articles 3, 4, 6 and 15 related to data centers and other relevant definitions. Article 15 is the definitions article. Initiation only; no draft text is published. Section 18 carries it as a live item.

The county's pipeline is larger than its built stock. The Remington Digital Campus application on roughly 200 acres, which sought approval for an aboveground water storage facility and a water treatment system alongside two substations, was recommended for denial four to one on July 16, 2026. The applicant withdrew on August 17, 2026, its second withdrawal in twelve months, and asked the county to strike all four items from the September 10 Board of Supervisors agenda.[237] *Press*. Remington Technology Park is approved and building.

What the county's own consultants told it in 2024 frames all of the above. A groundwater protection review presented to the Board on November 14, 2024 states that the county and the Authority have invested in excess of $100,000,000 in water supply infrastructure, "yet there had been little to no money spent on protecting those water supply Production Wells." It models the Bealeton wellhead protection area at 2.2 square miles under 2022 to 2024 pumping and **3.3 square miles under simulated drought**, a fifty percent expansion of the capture zone under exactly the conditions now obtaining. Among its recommendations are to develop a countywide

drought water supply management plan on a well-by-well basis and to generate water level trigger levels for each production well.[238] Neither exists.

8.5 Warrenton, and a prohibition that no longer exists

For four years the Town of Warrenton held the only categorical bar on potable water for data center cooling located in the local ordinance census maintained for this series, as of August 25, 2026. It repealed the bar in July 2025, and it repealed it by removing the use. The sequence is the finding, and it is a better one than the snapshot it replaces.

8.5.1 The provision, 2021 to 2025

The town permitted data centers in its industrial district by text amendment in 2021, subject to a condition its own staff quoted as follows: "The Town of Warrenton Zoning Ordinance Article 9-26.B states data centers shall utilize recycled water for air chillers, in conjunction with using recycled water, for cooling purposes. Potable water is not permitted to be used for cooling."[239]

The provision was applied once. On **January 10, 2023**, following a planning commission hearing of November 15, 2022, the council approved a special use permit for an Amazon data center on Blackwell Road, four votes to three. The facility is 220,200 square feet on 41.79 acres.[240] Condition 13 of the permit carries the ordinance forward: the applicant "shall limit its water use to internal domestic uses ... It shall not use public water for the general purposes of cooling the data center, but may use it for the initial charging of the cooling system."[241]

The committed water use is 190.5 gallons per day for domestic purposes and 190.1 for humidification, a total of **380.6 gallons per day**, with a one-time 19,000 gallon charge of the cooling system "since the system is a closed system."[242]

On how that number was arrived at. Press reporting from February 2023 records that Amazon's representative first said the facility "is air-chilled. It doesn't use water," then stated 1,500 gallons a day, then on September 9, 2022 revised to 138,912 gallons a year.[243] **Author's calculation:** 138,912 divided by 365 is 380.6, exactly the figure in the town's staff analysis. Cite the staff analysis for the number. The press is useful for the narrative of how the number moved, and is labeled as press here.

The prohibition was never tested against a facility drawing water, and it was not litigated on its own terms, on the town records located for this volume and set out in this section. Nothing was built. No waiver was located, and the town's records were not searched exhaustively for one.

8.5.2 The repeal

Ordinance ZOTA-25-1, adopted July 8, 2025 on a vote of six to nothing, strikes data centers from Articles 3, 9 and 12 of the zoning ordinance and deletes § 9-26 in its entirety, including the potable water prohibition. Its recital states that Council "now finds that a Data Center is a Use that does not further the health, safety and welfare of the public."[244]

The chain runs: council resolution of initiation, March 22, 2025; planning commission work session, April 22; planning commission public hearing and recommendation, four to one, May 20; council work session, June 10; adoption, July 8.

The repeal is verifiable three ways beyond the ordinance itself. The town's currently posted Article 3 and Article 9 contain no occurrence of the term "data center," and § 9-26 has been reused for lodging uses in the central business district. The town's consultant zoning rewrite of May 2026 states at page 3-35 that it "does not carry forward existing data center standards from Section 9-26 because data centers are no longer a permitted use in any district."[245]

Warrenton did not soften the prohibition. It removed the use the prohibition applied to. The recital states a judgment about the use rather than about the instrument, and nothing in the ordinance, the initiation resolution, the two work sessions or the planning commission recommendation is a stated finding about water. This volume does not infer from the repeal that the town judged its water condition inadequate. What the repeal establishes is narrower and still worth stating: the condition was in force for four years, was applied once, was never tested against a facility drawing water, and was extinguished without ever having been evaluated.

8.5.3 The one permit the provision ever governed is frozen

The 2023 approval was challenged. *Cross v. Town of Warrenton*, CL23000128-00, seeks to void the 2021 text amendment and the special use permit from the outset.

A **consent order entered January 14, 2025** bars Amazon from seeking, and the town from approving, "further permits or approvals related to the construction of a data center on the Property ... until a Final Order has been entered."[246] No land disturbance permit and no building permit has issued.

The town's zoning administrator **denied** Amazon's determination of vested rights on October 24, 2025. The appeal to the board of zoning appeals was **deferred three to nothing on February 3, 2026**, pending the case. Trial ran seven days from March 9, 2026, with final argument on June 15, 2026. **No ruling is present in the press corpus searched as of August 25, 2026.**

The town's litigation posture also changed. Press reporting records the new town attorney telling the court that the challenge to the 2021 amendment is legally cognizable and that Warrenton no longer shares the applicant's alignment in the litigation.[247] *Press*.

So the project the prohibition governed has been frozen by a court for longer than the prohibition was in force, and the town that imposed it has since banned the use and changed sides.

8.5.4 The town's own supply

Warrenton's water is surface water, unlike the county authority described in Section 8.4, and its constraint is stated in its own words. The treatment plant is rated at 3.2 million gallons per day following a 2011 upgrade, and the town states that "further capacity increases are limited by the 2.3 MGD Safe Yield of the reservoirs." The Warrenton Reservoir holds approximately 124 million

gallons against a stated safe yield of 1.14 million gallons per day; Airlie holds approximately 260 million gallons.[248]

The town's drought ladder is reservoir-elevation based, running Condition 1 at 150 days of storage through Condition 4, under a water conservation ordinance of 1999.[249] **No 2026 drought declaration or restriction by the Town of Warrenton is present** in its alert center, news releases, public works pages, or the council packets for May 12, June 9, July 14, July 16 or August 11, 2026, as of August 25, 2026. Current reservoir elevations are not published, so the town cannot be scored against its own ladder from outside.

A citation trap worth recording: a news account of voluntary conservation in Warrenton is dated July 11, **2024**, and search engines surface it as current. A near-identically worded mandatory restriction notice from the county authority also exists from summer 2024. Both 2026 documents should be cited by full file name.

8.5.5 What the repeal removes from this volume

Section 8.4 establishes that Fauquier County's only regulatory lever on data center water is the phrase "recycled water," which its zoning ordinance does not define. Warrenton's repeal removes the one instrument in this research that did define the obligation and made it categorical.

No local government west of Interstate 95 imposing an enforceable quantitative water condition on a data center is present in the local ordinance census maintained for this series as of August 25, 2026, now that Warrenton's provision is repealed. Section 18 carries the Fauquier text amendment initiated August 20, 2026 as the live successor to watch, and it should be read against this section rather than on its own.

8a. Where the Three Categories Collide

Four counties sit along the interstate between Fredericksburg and the Potomac. Caroline, Spotsylvania, Stafford and King George are where the territorial, temporal and definitional exemptions all operate at once, on the same water, in the same watershed. Each of the three has been described separately in the sections above. Here they run together, and what they produce is a corridor carrying substantial data center load in which no instrument conditions a withdrawal on how much water is available. The question is asked. Section 8a.2 records the Commonwealth's answer for the Caroline centroid and Section 15.4 the safe-yield content a regional plan must carry. Neither reaches a permit, because in this corridor there is no permit for it to reach.

The governance, fiscal and land-use record for these four counties and the City of Fredericksburg belongs to the companion volume and is not repeated here.[250] What follows is the hydrogeology and the permitting.

8a.1 The line runs through the counties, not between them

Caroline, Spotsylvania and Stafford are three of the eight counties that 9VAC25-600-20(A) divides at Interstate 95. King George is named whole. The regulation therefore treats a single continuous aquifer system as governed on one side of a road and ungoverned on the other, four times over, within forty miles.

Figure 2 shows what the road is standing in for. The western edge of the mapped Coastal Plain in this corridor is not a boundary but a scatter of fifty-five separate traces spread across roughly twenty-five kilometers of longitude, the ragged updip margin of a wedge of sediment thinning to nothing over crystalline and Triassic basement. Interstate 95 runs through the middle of that scatter and crosses it at least six times.[251] At the latitude of the Centreport Parkway interchange the contact runs through the industrial park itself, which is mapped 71 percent Potomac Formation and 29 percent quartz diorite gneiss.[252]

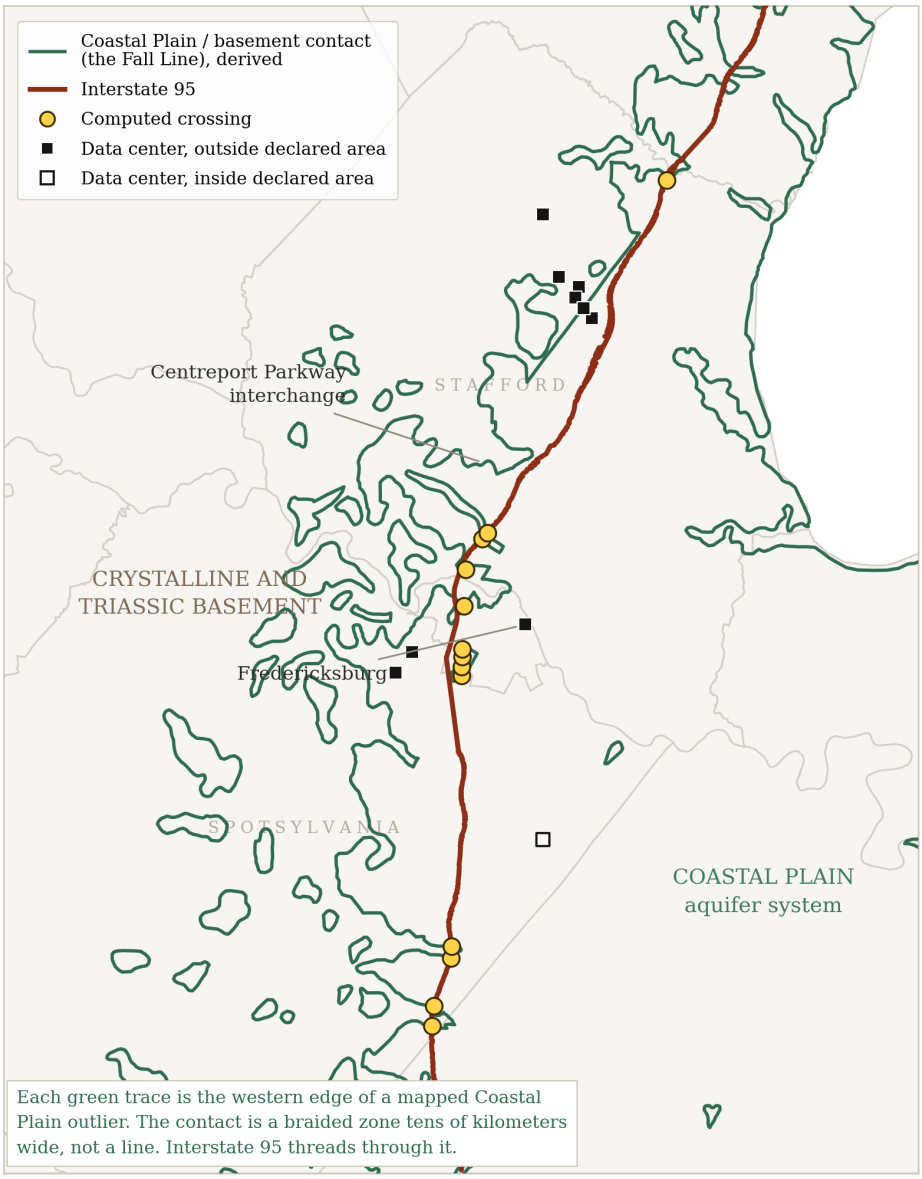


Figure 2. The Coastal Plain contact and Interstate 95 through the Fredericksburg corridor. The contact resolves into fifty-five separate traces across roughly twenty-five kilometers of longitude: a braided zone of outliers rather than a line. Derived from the 1993 Geologic Map of Virginia at 1:500,000; no Virginia agency publishes the Fall Line as a line feature. Crossings shown are computed, and four of them fall at or below the source map's positional precision, so the volume reports at least six rather than a precise count.

The point is not that the drafters chose the wrong line. It is that they chose a line at all. A wedge that thins to a feather edge has no boundary to draw, and the drafters of 1989 wanted an administrable one. They took the road.

8a.2 The aquifer thins toward the line, and the state's only quantitative instrument says so

The Commonwealth has published exactly one estimate of what this aquifer can support, and Caroline sits near the bottom of it. DEQ put the headline to the Commission in two numbers: the aquifer system has "limited capacity for significant new withdrawals," with a "[m]aximum of

360,000 gallons per day in the eastern Northern Neck" and "30,000 gallons per day in some western regions near I-95."[253] The 30,000 figure is the agency's own summary of the western margin, and it is lower than the Caroline centroid figure this section uses. The SJ 25 technical work returns a maximum passing withdrawal of **60,000 gallons per day** at the Caroline centroid. Two centroids returned lower values, the Middle James and the Chowan, and both are reported by DEQ only as less than 30,000 gallons per day because that was the lower limit of its simulation rather than a floor on the aquifer. Caroline is therefore the lowest centroid the study resolved to a number, and the two below it are in the Richmond and Sussex areas rather than in this corridor.[254] DEQ's own working benchmark for hyperscale cooling is on the order of **300,000 gallons per day per 100 megawatts**, which is 3,000 gallons per day per megawatt.[255] On that benchmark a single 100 megawatt campus would exceed the centroid's maximum passing withdrawal by a factor of five. **The benchmark is disputed, and the dispute belongs here rather than only in Section 9.2.** The Interstate Commission on the Potomac River Basin uses 800 gallons per day per megawatt for data centers in the basin, which is roughly a quarter of DEQ's figure, and on ICPRB's number the same campus exceeds the centroid by about 1.3 rather than by five.[256] Section 9.2 sets out both and states that this volume has not established which is right. The exceedance is therefore reported as a range across the two published benchmarks, and the direction of the finding does not depend on the choice: on either figure a single campus exceeds what the Commonwealth's own model says the aquifer at that point will pass.

That is the finding, and it needs the caveat that the section above already applied to the instrument generally: a centroid figure is a modeled quantity at a modeled point and is not a permit condition, a safe yield, or a statement about any particular well. It is nonetheless the only such estimate located in the Commonwealth's published record as of August 25, 2026, on the corpus set out at Section 7.2, and it says the aquifer at the northwestern margin is close to fully committed.

North of Stafford the model does not reach at all. The characterization gap described in §7 is not a technicality confined to a report's appendix; it is the reason no comparable figure exists for the corridor's northern half.

8a.3 County supply here is Potomac aquifer water

Caroline and King George draw their public supply entirely from the confined Potomac aquifer, verifiable permit by permit and screen depth by screen depth, and a data center buying finished water from either county is buying aquifer water that appears nowhere in the permitting record under its own name. **Section 5.2 sets out the permits and the depths. Section 5.2a sets out the definition that makes the purchase invisible.** Neither account is repeated here.

What this corridor adds is scale. The definitional exemption described in the abstract at Section 5 is the mechanism by which load reaches the Coastal Plain aquifer across four counties at once, while remaining absent from the search anyone would think to run.

8a.4 Caroline's answer, and what DEQ wrote into it

Caroline's response to a foreclosed aquifer is a Rappahannock intake and roughly thirty-five miles of pipe across a watershed divide. The water is drawn from the Rappahannock and, after use and

treatment, discharged to Polecat Creek and from there to the Mattaponi, so the transfer moves water between major river basins.[257] DEQ issued **VWP Individual Permit No. 20-0514 on November 26, 2025**, to the Caroline County Department of Public Utilities, expiring November 25, 2040.[258]

The permit authorizes a maximum of **9.0 million gallons per day** and 237 million gallons per month. Its annual figure appears twice and disagrees with itself: the cover page states 1,832 million gallons per year, while Special Condition I.D.2.e and the Permit Decision Rationale both state 1,862.[259] Which controls has not been established. The number is reported here in both forms rather than resolved, because resolving it would require an answer DEQ has not published.

Three features of the instrument bear on this volume's argument.

First, the permitted volume and the built capacity are different numbers. The intake is engineered as three 42-inch wedge-wire screens on a 30-inch conveyance pipe, the Marine Resources Commission was asked to authorize a 13.9 million gallon facility, and the hydrodynamic modeling was run at 13.9 MGD. The permit caps withdrawal at 9.0.[260] Actual withdrawal is zero, because nothing is built. Permitted, rated and actual are three different numbers in a single project, and only one of them is the permit, which is the distinction this volume has insisted on throughout and which the corpus routinely collapses.

Second, cooling was removed from the application and then excluded by express term. The applicant's revised demand projections of **December 20, 2024** withdrew industrial cooling water from the requested limits. DEQ then wrote the exclusion into the instrument twice, on the cover page as "Other uses are not authorized by this permit," and in the Permit Decision Rationale as "industrial cooling uses are not authorized under this permit."[261] The maximum day requested fell from 13.90 MGD to 9.00, the maximum annual from 2,884 million gallons to 1,862.[262]

The 2.63 MGD figure measures households. DEQ's 2.63 MGD is combined residential demand for the proposed service area, later revised to 2.47 MGD residential plus 1.34 MGD commercial.[263] The cooling figures are separate and larger. The application's summary of industrial cooling water demands gives a maximum day rising from **0.4 MGD in 2025 to 4.2 MGD in 2038**, allocated across three named prospects: Project Tract at 0.2 rising to 0.6, Project Clean Arc at 0.2 rising to 1.4, and Project Tricycle at zero rising to 2.2.[264] The cooling figures are the ones that matter, since they are what a county told the Commonwealth its data centers would need.

Third, the permit does what the groundwater program west of the line does not. It curtails by quantity on a declared condition: 7.0 MGD on drought warning, 6.0 MGD on drought emergency, triggered by a declaration in the Northern Coastal Plain evaluation region or by the county's own ordinance, whichever is more restrictive, with weekly reporting to DEQ throughout.[265] It runs fifteen years and cannot be extended past them.[266] Caroline crossed a watershed divide and acquired, in exchange, the only enforceable quantitative ceiling anywhere in this corridor.

King George was to have been the partner in this one. The county agreed in 2021 to take water from the Caroline intake, and both counties abandoned the arrangement once they learned what DEQ would require before water could be moved across the county line; Caroline then redesignated the volume to industrial cooling.[257] King George is separately under DEQ direction to move its own public supply off the Potomac aquifer and onto the Rappahannock.[4]

8a.5 King George, and the vintage of a coal plant's intake

The temporal category is easiest to see at Birchwood, where a decommissioned power station's water is now a data center's water. The plant closed on March 1, 2021 and was demolished by May 2022. Its Rappahannock intake did not close, and the permit that authorizes it carries no published volume limit, issuance date, expiration date or permittee of record. **Section 5.5 sets out that account in full, including the aquifer permit at the same site, the transfer of the older groundwater permit to Amazon Data Services in January 2024, and the treatment convention this volume adopts for the unnamed permittee.** It is not repeated here.

What belongs in this section is the geography. Birchwood sits inside the Eastern Virginia Groundwater Management Area, in a county named whole by the regulation, and it is the one facility in this research that holds a withdrawal permit in its operator's name. It holds it because it bought a power plant that already had one. Forty miles west, in the part of Stafford and Spotsylvania that the same regulation excludes, no permit is required at any volume. The corridor contains both conditions.

8a.6 What the collision produces

Three questions are asked of any withdrawal in this corridor. Where are you. When did you start. Did you take it from an original source. A data center in Stafford west of the interstate, buying finished water from a utility whose intake predates 1989, answers all three in the way that exempts it, and the volume it uses appears in no permit at any figure.

The exceptions prove the shape of the rule. Caroline obtained a quantitative ceiling only by leaving the aquifer and crossing a watershed divide to a river. King George's cooling runs on a permit whose only published attribute is that it exists. Between them lies a corridor where the state's single quantitative estimate of aquifer capacity returns 60,000 gallons a day, the model that produced it stops before the corridor's northern half, and the counties that would be bound by it are divided down the middle by a road.

9. Consumptive Use and the Return-Flow Argument

The most common defence of data center cooling in Virginia is that the water comes back. It mostly does not, and the two organizations best positioned to know say so from opposite directions.

9.1 What the published figures do and do not permit

Buried in the availability charge schedule effective January 1, 2026 is Loudoun Water's design assumption for water-cooled data centers. The line item reads "Data Center (Water Cooled) - Process Meter," with maximum day water at 1 gallon per day per square foot and average day sewer at 0.125, and carries the note: "Assumes a 25% Blow Down to Sanitary Sewer. Does Not Include Domestic Meter."[267]

Read at face value, that note says roughly three-quarters of process water evaporates and about a quarter returns to the sewer as blowdown.

The two printed columns do not reconcile to that note, and the volume states the gap rather than talking past it. The ratio of 0.125 to 1.0 is 12.5 percent, not 25. The columns are on different bases, one a maximum-day water figure and the other an average-day sewer figure, so reconciling them requires a maximum-to-average ratio for the water side. At a ratio of exactly 2.0 the note and the columns agree.

Section 8.1 derives a different ratio from the same utility's published actuals. Data center demand in Loudoun Water's central service area moves from 2.6 to 8.0 million gallons per day between average and maximum day, a factor of 3.1. Prince William County's per-building figures give 4.9. Applying those to the fee schedule produces different answers:

Maximum-to-average ratio	Implied average-day water, gal/day/sq ft	Blowdown share	Implied consumptive share
2.0 (required to reconcile the note)	0.500	25 percent	75 percent
3.1 (Loudoun Water actuals, Section 8.1)	0.323	39 percent	61 percent
4.9 (Prince William per-building, Section 8.3)	0.204	61 percent	39 percent

Author's calculation, and the conclusion is a limit rather than a number. These are not competing estimates of one quantity. A fee schedule is a sizing standard applied per square foot; the 3.1 and 4.9 ratios are measured system and per-building behavior. Applying the second to the first mixes categories, which is why the table above should be read as a sensitivity test and not as three candidate values.

What it establishes is narrower and worth stating plainly: **the published Virginia figures do not permit a single consumptive-use fraction to be derived.** Which figure one gets depends entirely on which peak ratio is applied to a design standard that was not built to carry

one. The table is a sensitivity test, and the honest reading of it is that the fee schedule cannot settle the question. Section 9.2 sets out an independent figure arrived at by a different method, and the two should be compared rather than merged.

The schedule also directs that "water cooled data centers, water cooled schools, irrigation, and other determined high demand uses are always based on estimated flow," never on the flat meter-size rate.[268]

9.2 ICPRB's regional quantification

The Interstate Commission on the Potomac River Basin published a dedicated study of data center water use in March 2026, resting on its December 2025 metropolitan water supply study. Its consumptive use factor "for data centers in the basin is 800 gallons/day/MW with an assumed consumptive-use factor of 75%."[269]

That figure was arrived at independently, by a different method, from utility-reported demand rather than from a design standard. It sits at the top of the range Section 9.1 derives and matches the face reading of Loudoun Water's blowdown note. **It is corroboration of the high end, not of a settled value**, and this volume does not treat 75 percent as established. Where a single number is needed, the defensible statement is that consumptive loss from evaporative cooling is large, plausibly a majority of process water, and not resolvable to better than a range from the Virginia record now published.

Current conditions. "Within the WMA, average consumptive use in 2025 is approximately 4 MGD, with peak-day use of about 15 MGD." And the ratio that matters:

> "While data centers account for only 1% of total withdrawals in the WMA, they represent 9% of annual consumptive use and up to 12% of consumptive use in summer. On a basin-wide scale, data centers currently account for 0.3% of withdrawals and 3% of total consumptive use."[270]

Volatility. "Monthly use in summer can be close to three times the average annual demand while peak daily use can be as much as 10 times. This volatility coincides with the time of year when competing demands, such as outdoor water use, are at their highest, and river flows are lowest."[271]

Projection. With "over 100 million square feet of additional data center development" planned regionally, "data center water use within the WMA is projected to increase to approximately 22 MGD on average and over 80 MGD at peak by 2050." Upstream, annual average consumptive use is forecast to move from about 100 to 117 million gallons per day, of which 4.7 would be data centers, about four percent.[272]

A divergence to flag rather than reconcile. Section 8a.2 records DEQ's benchmark for a typical hyperscale facility at approximately 300,000 gallons per day for 100 megawatts, which is 3,000 gallons per day per megawatt. ICPRB uses 800. The two differ by roughly a factor of four on the central physical quantity in this subject, and this volume has not established why. DEQ's figure describes a facility as sited and permitted; ICPRB's is a basin-scale planning factor applied to installed capacity. That may account for the gap. It may not, and neither organization addresses the other.

And ICPRB rebuts the reclaimed-water defence directly:

> "The use of reclaimed water can be an effective way to reduce demand for potable supply. However, it does not eliminate consumptive loss. For evaporative cooling, reclaimed water is largely lost rather than returned to the river system, reducing return flows."[273]

It also names the regulatory gap in terms that match Sections 3 through 5 exactly:

> "Data centers in the Potomac Basin are typically supplied by public water utilities rather than self-supplied and therefore do not fall under existing consumptive use regulations and mitigation requirements."
>
> "These facilities are served by public water suppliers and, to date, hold no direct withdrawal permits."[274]

A dependency worth stating. ICPRB's current demand figures were "established using utility-reported average and peak water use in the Loudoun Water and Prince William Water service areas." Fairfax Water is not named as a data contributor.[275] The regional model rests on the two utilities that volunteered numbers, which is the same asymmetry Section 8.2 documents.

9.3 The argument being rebutted, in a utility's own words

Prince William Water states the return-flow case plainly:

> "Western Prince William County drinking water is supplied by Fairfax Water's Corbalis Water Treatment Plant, which draws from the Potomac River. Once used by data centers in western Prince William County, the wastewater is treated at the Upper Occoquan Service Authority Water Reclamation Plant and released as reclaimed water to the Occoquan Reservoir. In this water cycle, water used from the Potomac is reclaimed and released into the Occoquan Reservoir, adding volume."[276]

The inter-basin transfer described there is real, and it is the historical foundation of the Occoquan Policy. What the passage omits is that the fraction lost to evaporation never reaches the reclamation plant at all, and Section 9.1 establishes that the published Virginia record does not resolve that fraction to a single value. At the low end of the range it derives, the return-flow account still omits a substantial share of cooling water. At the high end, it omits most of it. The utility's statement is accurate about the water that completes the cycle and silent about the water that does not.

9.4 JLARC's statewide figures, and four cautions

The Joint Legislative Audit and Review Commission reported in December 2024 that "In 2023, the data center industry used an estimated 2.1 billion gallons of water, with just over a third coming from reclaimed water instead of new withdrawals," and that data center water use "accounted for less than 0.5 percent of total state withdrawals." It also found that "In 2023, 11 data center buildings each used over 50 million gallons, including one building that used 243 million gallons (10 percent of the industry's total use)," and that industry use ranged "from 0.2 to 21 percent" of water use at the six utilities its staff reviewed.[277]

First caution: the units are not consistent. The 2.1 billion gallon figure is metered utility deliveries and includes reclaimed water. The denominator, total state withdrawals, is DEQ withdrawal data. The 0.2 to 21 percent range excludes reclaimed water. These quantities should not be presented as a single clean ratio, and the phrase "consumptive use" does not appear in Report 598, its summary, its recommendations document or its briefing deck, as searched on August 23, 2026.

Second caution, and it is a correction to a figure in wide circulation. A percentage increase in data center water use over a baseline year is not present in JLARC Report 598 as of August 23, 2026. The "86 percent increase since 2019, from approximately 1.13 billion gallons" that appears in secondary work is not in the report PDF, the summary, the recommendations document, or the briefing deck. It should not be cited to JLARC. The misattribution has reached academic writing and not only press: the Center for Secure Water at the University of Illinois Urbana-Champaign states that "JLARC estimated that Virginia data centers consumed approximately 2.1 billion gallons of water in 2023, an 86% increase since 2019 (~1.13 billion gallons)," with the sentence linked to Report 598.[278] The 2.1 billion gallon figure for 2023 is JLARC's. The baseline and the percentage are not.

Third caution: the parenthetical does not follow from the two figures it sits between. JLARC reports one building at 243 million gallons and describes it in the same sentence as "10 percent of the industry's total use," against the industry total of 2.1 billion gallons it states two sentences earlier. 243 divided by 2,100 is **11.6 percent**, and 10 percent of 2.1 billion is 210 million. The parenthetical sits inside a verbatim quotation, so the arithmetic is JLARC's and the citation above is adequate; this is an editorial note rather than a citation defect, and the quotation is reproduced unaltered. Two denominators may be in play. The 2.1 billion gallon total includes reclaimed water, as the first caution records, and Report 598 does not state whether the 243 million gallon building figure does. A building total that excludes reclaimed water cannot be cleanly divided into an industry total that includes it, and on that reading neither 10 nor 11.6 percent is a ratio the report supports. This volume reproduces JLARC's parenthetical as written and does not substitute a recomputed figure for it.

Fourth caution, which is really the finding. JLARC obtained its water data from utilities rather than from the Commonwealth. Its own methodology appendix records that staff "received 2023 data center water usage information from water utilities," with usage "typically reported for anonymous, individual data center buildings," while its air analysis used DEQ's registry of sites holding active air emissions permits.[279] The legislature's auditors could use the state as a facility registry for air and could not for water. Section 5.3 states why.

The report's single water recommendation is to authorize localities to require water use estimates and to consider water use in rezoning and special use decisions. **No recommendation or policy option in Report 598 directs DEQ to collect, report, or disaggregate data center water use.**

9.5 What changes in 2027

Chapters 623 and 896 of the 2026 Acts of Assembly, effective January 1, 2027, require water suppliers already registering withdrawal data to disaggregate their reports by customer category,

itemizing potable and reclaimed volumes supplied to data centers holding a DEQ air permit.[280] Section 10 takes up the details and the limits.

Until that duty attaches, every Virginia figure for data center water use located in the course of this research originates in a voluntary disclosure by a utility. Loudoun Water and Prince William Water volunteered. No comparable disclosure by Fairfax Water is present in its published board materials, annual reports or rate filings as of August 25, 2026.

10. The 2026 Session

10.0 The General Assembly wrote this budget without the report

Senate Joint Resolution 25 directed DEQ to complete its meetings by November 30, 2025 and to submit its report "no later than the first day of the 2026 Regular Session of the General Assembly."[281]

The report is dated July 2026. Legislators received it in the third week of July. The appropriation act described in this section was approved on June 29, 2026.

Every provision below was drafted, negotiated and enacted before the legislature had the study. The two senators who requested a special session in response put it in writing to the Governor on July 30:

> "Legislators did not receive it until the third week of July, months after the legislative session adjourned and the new biennial budget took effect. Had the General Assembly reviewed these findings when the law required, it is safe to say the outcome of several legislative and budget decisions would have been different."[282]

The signatories are worth naming. **Senator Richard Stuart of King George**, who introduced Senate Joint Resolution 25 in the 2024 session and is therefore the author of the study that arrived late, and **Senator Russet Perry of Loudoun**, who is one of the two patrons of the western groundwater study at Item 366 paragraph N. The request was bipartisan and, as of August 21, 2026, the Governor had not publicly responded.[283]

This bears on how Section 7.5 should be read. The pattern described there, of money following the regime rather than the load, was set by a legislature working without the document that would have told it where the constraint actually binds.

10.1 A threshold matter of citation

The 2026 to 2028 biennial appropriation act was not enacted in the 2026 Regular Session. House Bill 30 was introduced on December 17, 2025, carried over, and enrolled, reenrolled and chaptered on June 25 and June 29, 2026 under Special Session I. It is one bill with two session designations, which is why a citation to a 2026 Regular Session chapter for any provision below is wrong. The Regular Session produced only the caboose bill, Chapter 7 of the 2026 Acts of Assembly, approved February 20, 2026, which contains no cooling, closed-loop, or water scarcity language.

The operative document is **Chapter 1 of the 2026 Acts of Assembly, Special Session I, approved June 29, 2026.**[284] A citation to a 2026 Regular Session chapter for any of the provisions below is wrong.

10.2 Item 366, paragraph M: one paragraph, two mandates, two geographies

The paragraph has two operative subparagraphs. Subparagraph M.1 directs a rulemaking:

> "The Department of Environmental Quality (Department) shall amend 9VAC25-780, Local and Regional Water Supply Planning, no later than July 1, 2027, to establish criteria for the Department to determine 'Cooling Water Scarcity Areas' where the evaporation of water for cooling purposes could have detrimental reductions in the quality or quantity of water available for other beneficial uses, with a particular focus on the Eastern Virginia Groundwater Management Area, as that term is defined in 9VAC25-600-20(A). The initial promulgation of such regulations is hereby exempted from the Administrative Process Act (§ 2.2-4000 et seq. of the Code of Virginia) and the Department shall complete such regulatory action without further action by the State Water Control Board."[285]

Subparagraph M.2 imposes the substantive duty, and it does so twice, on two different triggers:

> "In a Cooling Water Scarcity Area, prior to July 1, 2032, a data center, as that term is defined in subdivision A 43 of § 58.1-3506, Code of Virginia, shall demonstrate to the satisfaction of the department that it has minimized the use of any type of water for cooling purposes and demonstrated the use of best available water-efficient technologies, including air cooling, closed-loop systems, recycled water, stormwater reuse, non-potable reclaimed water, or other technologies approved by the department. A data center shall only use direct evaporative cooling in conjunction with one of the department's approved primary technologies. **In the Eastern Virginia Groundwater Management Area, a new data center that submits a complete application for a Department of Environmental Quality air permit after January 1, 2027,** shall demonstrate to the satisfaction of the department that it has minimized the use of any type of water for cooling purposes and demonstrate the use of best available water-efficient technologies ... The department, by October 15, 2026, shall conduct a study and provide a plan on the retrofitting of existing data centers in the Eastern Virginia Groundwater Management Area to use air cooling systems, 100 percent recycled water and/or stormwater for cooling, or use a closed loop system."[286]

The obligation that binds automatically is bounded. The duty in M.2 that binds, on a fixed date, without any further agency action, is scoped by the words "In the Eastern Virginia Groundwater Management Area." The October 15, 2026 retrofit study is scoped the same way. Section 2 established what that boundary contains and, more to the point, what it does not: Loudoun does not appear in the defining regulation, and Fairfax and Prince William appear only east of Interstate 95.

The consequence is worth stating without decoration. **The cooling requirement that operates by its own terms binds where the fewest data centers are.**

The criteria directive is not bounded. The rulemaking directive in M.1, quoted first above, contains no jurisdictional limitation. Its only geographic language is "with a particular focus on the Eastern Virginia Groundwater Management Area." Focus directs attention; it does not confine authority. The drafters had limiting language available and used it three sentences later in the same paragraph. On the enacted text, the Department may designate a Cooling Water Scarcity Area anywhere in the Commonwealth, Loudoun included.

This is a construction, and it is this author's. The argument for it is the one just given: the drafters had limiting language available, used it three sentences later in the same paragraph, and

did not use it here. Under the ordinary canon that differing language in adjacent provisions of a single enactment is presumed deliberate, "with a particular focus on" directs attention without confining authority.

The counterargument deserves to be stated rather than left for a reader to find. Three points run against the reading.

First, the provision is a paragraph of the Appropriation Act, not a Code amendment, and it confers no standing authority of its own. Virginia's substantive groundwater authority runs through Chapter 25 of Title 62.1, which conditions the declaration of a management area on findings the Board must make on a record. An agency asserting a power to designate scarcity areas statewide, on the strength of a budget paragraph that exempts its own rulemaking from the Administrative Process Act and directs it to proceed "without further action by the State Water Control Board," would be asserting a delegation with no Code footing and no procedural check. A reviewing court could read the focus language as the enactment's only expression of intended scope precisely because nothing else in it supplies one.

Second, budget language is customarily read against the appropriation it accompanies, and the appropriation here funds work in and adjacent to the Eastern Virginia Groundwater Management Area. Paragraphs N, O and Q of the same item are each geographically scoped, two of them expressly to that area or its upper portions. A reader who takes the item as a whole may reasonably conclude the drafters were legislating about the east.

Third, the practical consequence cuts both ways. If the reading is right, the Department already holds a power it has not exercised and Section 12 documents that it has not started. If the reading is wrong, the mandate that binds automatically is the whole of the program and the corridor is outside it. **The volume's central asymmetry survives on either construction**, because on the narrow reading the gap is permanent and on the broad reading it is contingent on an agency choosing to close it. What the construction determines is not whether the gap exists but whether it can be closed without further legislation.

Both statements are true simultaneously, and the volume's argument requires holding them apart. The mandate that operates now cannot reach the data center corridor. The mechanism that could reach it does not yet exist, has no Code authority behind it, and Section 12 establishes its current status.

A drafting defect worth flagging. The Cooling Water Scarcity Area duty in M.2 reads "prior to July 1, 2032," which is an end date rather than a start date. Read literally, that duty lapses in 2032 while the Eastern Virginia obligation, which carries no sunset, continues. Nothing in Item 366 resolves the tension, and this volume has not read Chapter 1 in full for a provision that might.

10.3 What else passed

Statewide water disclosure, effective January 1, 2027. House Bill 496 and Senate Bill 553, enacted as Chapters 623 and 896 and approved April 13, 2026, amend § 62.1-44.38 to require suppliers already registering withdrawal data to disaggregate their reports:

> "Any water user required to register water withdrawal and use data pursuant to this subsection that provides water to another person offsite shall include in its report ... the total volume of potable water and, reported separately, the total volume of reclaimed water provided during each month for each of the following categories: (i) a data center, as that term is defined in subdivision A 43 of § 58.1-3506, with an air permit issued by the Department ..."[287]

No geographic limitation. This is the provision that reaches Loudoun and Prince William. Two limits the caption obscures: the duty falls on the water supplier rather than the data center, and it captures only data centers holding a DEQ air permit. The amendment also provides that "Reclaimed water volumes shall not be aggregated with potable water volumes in any public reporting, summary, or planning document produced by the Board **pursuant to this section**." The limiter matters: the non-aggregation rule reaches documents produced under § 62.1-44.38, not everything the Board publishes. Within that scope it is a direct legislative answer to the accounting problem Section 9 describes.

A second statewide channel, with a nearer deadline. Item 477, paragraph D directs the State Corporation Commission, assisted by DEQ, to collect and report in aggregate form "by October 1, 2026, and each year thereafter" a set of data including "all data center water usage information from municipal or private water providers."[288] No geographic limitation, and the first deliverable falls before this volume is a year old. The word carrying the limit is "aggregated." A statewide total reported to two money committees answers a budget question rather than the visibility question Sections 4 and 5 describe.

Siting assessments, where water is optional. House Bill 153 and Senate Bill 94, enacted as Chapters 567 and 568, add § 15.2-2209.4 on siting assessments for high energy use facilities of 100 megawatts or more. The provision is statewide. Water is permissive: a locality "may also require that a site assessment examine ... (i) ground and surface water resources." Only the sound profile is mandatory.[289]

And a waste heat study, House Bill 323, enacted as Chapter 591, with a Department of Energy report due September 1, 2026.[290]

10.4 What did not pass

Five bills bearing on data center water died in the 2026 Regular Session.[291]

House Bill 589 would have imposed water reporting on data centers directly rather than on their suppliers. A subcommittee recommended laying it on the table by seven to three on February 11, and it was left in committee on February 18.

Senate Bill 552 would have directed DEQ to set standards including water usage and source impacts. It failed to report from Local Government on February 2 on a tied vote, seven to seven with one abstention.

House Bill 387 would have barred consumptive-use withdrawals from the Occoquan Reservoir. It was tabled in committee twenty-two to nothing on February 11.

House Bill 945, on geothermal for high energy users, was left in Rules on February 18.

And House Bill 501 would have directed the western groundwater study by statute. It was left in the Committee on Rules on February 18, 2026. Its substance was enacted anyway six weeks later as Item 366, paragraph N. Section 7.5 sets out what that study is and the condition it was in on August 20. The point for this section is narrower: the only instrument in Item 366 that looks at groundwater in the data center corridor exists at the pleasure of an appropriation act rather than in the Code, because the bill that would have codified it died in Rules. Section 7.8 sets out the assessments that do exist in the corridor, and they are county cooperatives rather than Commonwealth instruments.

Five more were continued to 2027 and remain live. Senate Bill 417 would require recipients of the Cloud Computing Cluster Infrastructure Grant Fund to use reclaimed water for water-dependent cooling, ramping from 60 percent on July 1, 2027 to 100 percent by July 1, 2031; it was continued in Finance and Appropriations fifteen to nothing. Senate Bill 521, on rainwater harvesting for the dissipation of heat, was continued twelve to two. House Bills 591 and 1515 and Senate Bill 473 were also continued.[292]

Senate Bill 417 is the one to watch, and Section 8 explains why: the June 18, 2026 minutes of the Fairfax Water board record the utility coordinating "strategies to communicate Fairfax Water's opposition to its inclusion in the budget," noting that the budget version "removes the negotiated Occoquan carve-out."[201]

10.5 A phrase that exists in only one place

The phrase "cooling water scarcity" is not present in the bill text of either 2026 session in the Legislative Information System as of August 23, 2026. It exists in the appropriation act. It is not present in the Code of Virginia or in Title 9 of the Administrative Code as searched on August 23, 2026.

That is not a technicality. An appropriation act is enacted for a biennium. A regulatory program whose sole authority is budget language carries only as long as that language is carried forward, and it can be dropped in a future budget without a repeal vote on any bill.

10.6 The structural twin

Item 367, paragraph E of the same act directs DEQ to adopt data center noise regulations effective no later than December 31, 2029, with civil penalties up to $32,500 per day beginning January 1, 2030. That action is also exempted from the Administrative Process Act, and it is statewide.[293]

Two data center regulatory programs were created in the 2026 budget. Both bypass notice-and-comment rulemaking. One is statewide on its face. The other is the subject of Section 12.

11. What the Governor Changed

The General Assembly passed a technology mandate. What was signed is a demonstration standard. The difference is four days and one round of gubernatorial recommendations, and it is invisible to anyone reading the conference report.

Enrolled, June 25, 2026:

> "In the Eastern Virginia Groundwater Management Area, all new data centers who submit a complete application for a Department of Environmental Quality air permit after January 1, 2027, **shall either use air cooling systems, 100 percent recycled water and/or stormwater for cooling, or use a closed loop system.**"[294]

Enacted, June 29, 2026:

> "In the Eastern Virginia Groundwater Management Area, a new data center that submits a complete application for a Department of Environmental Quality air permit after January 1, 2027, **shall demonstrate to the satisfaction of the department that it has minimized the use of any type of water for cooling purposes and demonstrate the use of best available water-efficient technologies, including** air cooling, closed-loop systems, recycled water, stormwater reuse, non-potable reclaimed water, **or other technologies approved by the department.**"[295]

Paragraph M.1 was not touched. The Governor's amendment struck M.2 entire and replaced it.[296] The two prongs of M.2 did not start from the same place. The Eastern Virginia prong was a closed list of three technologies. The Cooling Water Scarcity Area prong was already a standard administered by the agency, requiring a data center to "certify to the Department" that it would minimize water use "to the maximum extent practicable, as determined by the Department." The three changes below do not land on the two prongs alike. The third reaches both. The first is a closed list becoming an open one in the Eastern Virginia prong, while in the scarcity-area prong, which carried no enumerated list at all, the same amendment created one. The second is the one that divides them. The Eastern Virginia prong went from a self-executing rule to an agency judgment. The scarcity-area prong was already administered by the agency, so the amendment altered its wording from "certify to the Department" to "demonstrate to the satisfaction of the department" without altering its character.

Three changes matter.

A closed list became an open one. The enrolled text named three permitted technologies and stopped. The enacted text names five as examples and adds "or other technologies approved by the department."

A rule became a judgment. "Shall either use" is self-executing and testable by inspection. "Shall demonstrate to the satisfaction of the department that it has minimized" is a standard administered case by case, and "best available" imports a body of doctrine that requires the agency to weigh feasibility and cost.

And evaporative cooling was let back in. The sentence "A data center shall only use direct evaporative cooling in conjunction with one of the department's approved primary technologies" appears nowhere in the enrolled paragraph and twice in the enacted one, once in each prong.[296] **What follows from that is a construction, and it is this author's.** The enrolled text named three technologies and stopped, and evaporative cooling was not among them. The enacted text names evaporative cooling expressly and permits it in conjunction with an approved primary technology. Read that way, a mechanism absent from a closed list is now present in an open one.

The counterargument deserves to be stated. The enrolled list included "100 percent recycled water and/or stormwater for cooling," which constrains the source of the water rather than the mechanism that evaporates it, so an evaporative system running on recycled water arguably satisfied the enrolled text already. On that reading nothing was let back in, and what the enacted sentence adds is a restriction, since it permits direct evaporative cooling only in conjunction with an approved primary technology. The volume does not adjudicate between the two readings. What is not in dispute is that the sentence is new: it appears twice in the enacted paragraph and not at all in the enrolled one.

Why this section exists. Any account of the 2026 cooling mandate written from the conference report, from the enrolled bill, or from contemporaneous press coverage describes a mandate that was not enacted. This volume's method requires enacted text for load-bearing claims, and this provision is the clearest demonstration in the corpus of why. The difference between the two versions is the difference between a rule and a conversation with an agency.

12. The Scarcity Area That Has Not Been Started

Section 10 established that the Cooling Water Scarcity Area criteria are not geographically bounded, which makes this the one mechanism in Virginia law capable of reaching data center cooling in Loudoun. This section establishes what has been done with it.

12.1 What the directive requires and how it will be made

DEQ must amend 9VAC25-780 no later than July 1, 2027 to establish designation criteria. The initial promulgation is "hereby exempted from the Administrative Process Act," and the Department is directed to "complete such regulatory action without further action by the State Water Control Board."[297]

Read those two clauses together. There will be no notice of intended regulatory action, no proposed stage, no public comment period, and no board vote. The geographic scope of the only program that can reach Northern Virginia, the largest data center market in the world at approximately 13 percent of reported global operational capacity,[298] will be settled by agency staff drafting, on a record the public will not see until the regulation is final.

There is also no Code of Virginia section behind it. The authority is budget language, subject to the limitation in Section 10.5.

12.2 Nothing has been filed

No regulatory action implementing the Cooling Water Scarcity Areas directive is present on the Virginia Regulatory Town Hall as of August 23, 2026.

Corpus searched, all retrieved that date: the Town Hall chapter page for **9VAC25-780**, which reads "Current Actions: None," with its newest action effective October 9, 2024 and a periodic review of July 31, 2023 resolved "Retain As Is"; the chapter page for **9VAC25-600**, which also reads "Current Actions: None," newest action effective June 4, 2014; DEQ's list of 33 current in-progress regulatory actions, which includes neither chapter; and Town Hall title and full-text searches for "Cooling Water Scarcity," "Water Scarcity," "scarcity," and "Item 366," which return no relevant results.[299]

12.3 Why the absence is meaningful rather than an artifact

The obvious objection is that an action exempt from the Administrative Process Act would not appear on Town Hall in the first place. That objection does not hold, and the reason is in DEQ's own filings.

Town Hall does publish APA-exempt DEQ actions, and DEQ has filed at least five exempt implementation actions arising from the 2026 session through August 2026. One of them is **Action 7042, Stage 11221**, amending 9VAC25-200 to implement Chapters 623 and 896, the statewide data center water disclosure statute discussed in Section 10.3.[300]

DEQ is demonstrably posting its 2026 budget-driven and bill-driven exempt actions. It has posted the one that requires suppliers to itemize data center water. It has not posted the one that would

let the agency regulate data center cooling outside the Eastern Virginia Groundwater Management Area.

The October 15, 2026 retrofit study has no Town Hall footprint either, but that is expected: it is a report rather than a rulemaking, and would surface in the General Assembly's reports series after filing.

12.4 What this means for the volume's thesis

The Commonwealth's answer to data center water in the west, as of August 2026, consists of one disclosure duty that begins on January 1, 2027 and falls on utilities, and one unstarted rulemaking due July 1, 2027 that will be written without public process. Neither limits a withdrawal. Neither existed a year ago. Both are real, and the volume should not describe the field as empty.

What the volume can say is narrower and harder to answer. The instrument that binds today stops at a highway. The instrument that could cross it has not been begun, with ten months to run.

13. The Dormant Authority, and the 1993 Proceedings

Virginia has a statute for allocating surface water under stress. No Surface Water Management Area has ever been declared under it, on the corpus and date set out at Section 13.6. In 1993 it opened three proceedings under that statute and finished none of them, and the record of how they ended is thinner than the record of how they began. Appendix C sets out the docket record; this section takes what bears on the argument.

The James River proceeding ran longest and came closest. The Shenandoah docket goes silent after September 6, 1993. The North River advisory group was still convening in Bridgewater in October 1995, and the James River advisory group in Richmond in December 1995 and January 1996. In 2000, seven years after opening, DEQ was still describing the James River docket to the State Water Commission as one that "is in the process of being designated a surface water management area."[301] The Shenandoah proceeding, for all its local petitioners and its Berryville advisory group, is the one that failed soonest. The eastern volume records the same three proceedings (*Two Systems, One Drought*, version 1.4, Section 2 and note 52).

13.1 The machinery

Chapter 24 of Title 62.1, enacted in 1989, establishes Surface Water Management Areas.[302] The trigger has three conjunctive prongs:

> "The Board upon its own motion or, in its discretion, upon receipt of a petition therefor by any county, city or town within the surface water management area in question, or any state agency, may initiate a surface water management area proceeding whenever in its judgment there is evidence to indicate that: 1. A stream has substantial instream values as indicated by evidence of fishery, recreation, habitat, cultural or aesthetic properties; and 2. Historical records or current conditions indicate that a low flow condition could occur which would threaten important instream uses; and 3. Current or potential offstream uses contribute to or are likely to exacerbate natural low flow conditions to the detriment of instream values."[303]

Note the discretionary "may." A qualifying petition creates no duty to act.

Declaration is by the State Water Control Board after a public hearing, on a further finding that "the public welfare, health and safety require that regulatory efforts be initiated." The implementing regulation makes the instrument explicit: the board "shall, **by regulation**, declare the area in question to be a surface water management area."[304] A declaration is therefore a full rulemaking, not an order.

And the entire permit program is inoperative until one issues. Section 62.1-243(A) exempts from the surface water withdrawal permit requirement, among other things, "(ii) any water withdrawal of less than 300,000 gallons in any single month" and "**(iv) any withdrawal in any area which has not been declared a surface water management area**."[305]

That is the same structure Section 3 describes on the groundwater side, and the same drafting device: the program is territorial, and outside a declared territory there is nothing to be excused from.

Grandfathering is generous and permanent. Withdrawals in existence on July 1, 1989 are exempt, whether held by political subdivisions, by Health Department permitted water companies, or by existing beneficial consumptive users. The exemption lapses only prospectively, when "the daily rate of any such existing withdrawal is increased beyond the maximum daily withdrawal made before July 1, 1989." Exempt users receive certificates rather than permits and must adopt a Board-approved conservation program.[306]

And the permits only bite in drought. Section 62.1-253 provides that permit conditions "shall be in force only in those times when low stream flows, or the potential therefor, result in a declaration." Section 62.1-245 allows a Board-approved voluntary agreement to displace the permit scheme entirely, controlling "in lieu of a formal order, rule, regulation or permit."[307]

13.2 The asymmetry, shown in the Administrative Code itself

	Surface water, Chapter 24	Ground water, Chapter 25
Procedural regulation	9VAC25-220	9VAC25-610
Declaration regulation	none exists	9VAC25-600-20
Areas declared	none	two

The groundwater side produced operative language the surface side never has: "The board hereby orders the declaration of the eastern part of Virginia as a groundwater management area."[308]

No declared Surface Water Management Area is present in the Virginia Administrative Code as of August 24, 2026. Corpus searched: the full chapter listing for Title 9, Agency 25, comprising roughly one hundred chapters, which contains a Chapter 600 designating groundwater management areas and no counterpart designating any surface water area; all seven Parts and all 37 sections of 9VAC25-220, one of which (§ 320) is repealed, which is wholly procedural and names no river; and DEQ's periodic review of that chapter on Form TH-05, dated August 8, 2001, which describes designation entirely in the conditional and recommends that the regulation "stay in effect without change."[309]

Because 9VAC25-220-40(B) requires that declaration proceed by regulation, the absence of a regulation is dispositive rather than merely suggestive.

13.3 Senate Document 56, and a correction to how it is usually described

Senate Document 56 of 2000 is frequently cited in this field as a study of a James River surface water management area. It is not. It is the annual Report of the State Water Commission to the Governor and the General Assembly, twenty pages, and its subject is water supply planning policy.[301] Its surface water management area content is one sentence, in DEQ's briefing at page 2, reporting that "One area, the James River in Richmond, is in the process of being designated a surface water management area." That is a status report rather than a recommendation, and its value is chronological: as of 2000 the 1993 James docket was still described by the agency as live. The same page records that two groundwater management areas had been designated, which is

the asymmetry of Section 13.2 stated by DEQ itself. The document's actual recommendations are two budget amendments, neither concerning surface water management areas.

13.4 The groundwater test is easier, and has been met twice

The comparison that matters is not between the two statutes in the abstract but between what each requires a petitioner to show.

Surface water, § 62.1-246(A): three conditions, joined by "and." Substantial instream values, *and* historical records or current conditions indicating a threatening low flow, *and* offstream uses contributing to or exacerbating it. All three must be present.

Groundwater, § 62.1-257(A): four conditions, joined by "or."

> "1. Ground water levels in the area are declining or are expected to decline excessively; 2. The wells of two or more ground water users within the area are interfering or may reasonably be expected to interfere substantially with one another; 3. The available ground water supply has been or may be overdrawn; or 4. The ground water in the area has been or may become polluted."[310]

And subsection B removes any doubt about how many are needed: "**If the Board finds that any one of the conditions required above exists**, and further finds that the public welfare, safety and health require that regulatory efforts be initiated, the Board **shall** by regulation declare the area in question to be a ground water management area."

The Commonwealth has declared two groundwater management areas, the Eastern Shore area and the Eastern Virginia area, both by regulation and both codified at 9VAC25-600-20. It has declared no surface water management area: none is present in the Virginia Administrative Code as of August 24, 2026, on the corpus set out at Section 13.2. **The groundwater threshold is materially lower than the surface water threshold**, and the Commonwealth has crossed the lower one twice and the higher one never. That ordering is what one would expect. It is worth stating because the two regimes are often described as parallel, and on their face they are not.

Condition 1 is the one in play. "Ground water levels in the area are declining or are expected to decline excessively" is the finding the Loudoun assessment in Section 7.8 asserts, and the word doing the work is "excessively," which the chapter does not define.

13.5 Who may ask

Neither statute gives a citizen a petition right. Section 62.1-257(A) permits the Board to act "upon its own motion or, in its discretion, upon receipt of a petition **by any county, city or town within the area in question**." The surface water provision is drafted the same way, adding state agencies.

That routing explains the shape of the western campaign. When the Loudoun County Preservation and Conservation Coalition, Loudoun Watershed Watch, Loudoun's Future, Loudoun Wildlife Conservancy, the Piedmont Environmental Council and Save Rural Loudoun wrote in April and May of 2026 asking for a groundwater management area covering the county, they could not

petition. It asked the Board of Supervisors to do so, "encourag[ing] the County government to advocate with DEQ to establish this protection."[311] The letter describes the request as carried by more than fifty Loudoun organizations and reports that three community meetings that April drew more than three hundred residents. Both figures are the coalition's own, stated in its own letter, and no independent record of either was located.

The mechanism is available, its threshold is the lower of the two, one of its four conditions is squarely asserted by a hydrogeologist's assessment, and the only parties who may invoke it are local governments and the Board itself.

Whether any locality west of Interstate 95 has ever filed such a petition is not established by this volume. The Virginia Register was searched for surface water management area proceedings and found three, all in 1993. No equivalent search of Board minutes for groundwater petitions was run, and the *Virginia Register* would record a petition only if it produced a notice of intended regulatory action. Section 17.3 keeps this open.

13.6 What the record supports

No declared Surface Water Management Area is present in the Virginia Administrative Code as of August 24, 2026, on the corpus set out at Section 13.2. It has also never been true that Virginia never tried. In 1993 the Commonwealth opened three proceedings at once, staffed advisory groups on all three, advertised meetings, priced the permits, counted the affected withdrawers, restarted the process to comply with a new statute, and then let all three lapse without explanation. The Shenandoah docket went quiet first, within five months. The James docket outlived it by at least seven years and was still being described by the agency as in progress in 2000. It produced nothing either.

The instrument is not unopened. It has been opened three times and abandoned three times, which is a harder fact about the Commonwealth than never having reached for it at all.

14. Water Year 2026

Section 8.7 set out the instruments that govern the Potomac and the thresholds at which they engage. This section sets out what the river actually did.

14.1 The year begins with Virginia out of drought

On June 16, 2025 DEQ lifted every remaining drought advisory in the Commonwealth. Its own newsletter: "For the first time in a year, Virginia is drought-free! ... DEQ, in coordination with the Virginia Drought Monitoring Task Force, has lifted drought advisories for 12 counties ... no counties remain under a drought watch or warning advisory." The regions cleared included Northern Virginia, comprising Arlington, Fairfax, Fauquier, Loudoun and Prince William, and the Shenandoah, comprising Augusta, Clarke, Frederick, Page, Rockingham, Shenandoah and Warren.[312]

This matters for the chronology, and it corrects a common compression. Water year 2025 was not the drought. In the middle of calendar 2025 Virginia was formally drought-free.

14.2 The declarations, and where they stopped

April 17, 2026. DEQ expanded warning advisories to 83 counties and 31 cities and established new watch advisories in 12 counties and 7 cities, stating that "all localities within the Commonwealth are under drought watch or warning advisories." Ten regions stood at warning, including New River, Northern Piedmont, Northern Virginia, Roanoke River, Shenandoah and Upper James. Three stood at watch, including Big Sandy.[313]

Every region west and north of the fall line was covered, five of them at warning.

July 7, 2026. The Drought Monitoring Task Force recommended a drought emergency for the Roanoke Drought Evaluation Region, covering ten counties and four cities.[314] **That was a recommendation.** A gubernatorial drought emergency declaration is not present in the Governor's executive actions corpus, comprising Executive Orders 1 through 19 issued between January 17 and August 18, 2026, as of August 24, 2026. The only emergency order in that period concerns winter weather. DEQ's own page remains conditional: "Should the situation continue, the Governor **may** issue a drought emergency declaration to activate mandatory water use restrictions."[315]

No emergency has been declared, and this volume does not say one has.

August 18, 2026. The Task Force met, and DEQ records that it is "meeting weekly."[316]

14.3 The gage record

All figures below are computed from United States Geological Survey daily values retrieved August 24, 2026, in cubic feet per second, on a water year running October 1 to September 30.

	Potomac at Point of Rocks	Potomac at Little Falls	Rappahannock near Fredericksburg	Rappahannock at Remington
Daily record begins	February 1895	March 1930	September 1907	October 1942
Complete water years	130	95	118	83
WY2025 annual mean	8,608	9,225	1,422	616
WY2025 rank, 1 = lowest	55 of 130	30 of 95	42 of 118	37 of 83
Lowest water year on record	4,015 (2002)	4,017 (2002)	439 (1931)	195 (2002)
WY2026, October 1 to August 23	4,363	4,858	521	270
Rank, same window, all years	**2nd of 131**	**2nd of 96**	**3rd of 119**	**4th of 84**
Only drier in that window	2002	2002	1931, 2002	2002, 1999, 1981

Water year 2025 was near median at all four gages. The entire historic-low signal is in water year 2026.

Record daily lows. Measured against the full period of record for each calendar date: nine new daily record lows at Point of Rocks, all in January and February 2026, with a period minimum of 1,120 cubic feet per second on December 17, 2025. Eight at Little Falls, with a period minimum of 832 on January 27, 2026. **Twenty-five on the Rappahannock near Fredericksburg**, including a continuous run from April 13 to April 30, 2026. **Thirty at Remington**, including runs from April 13 to 29 and May 3 to 20.[317]

Two monthly records on the Rappahannock. January 2026 at Fredericksburg, at a monthly mean of 262 cubic feet per second, and April 2026, at 468, are each the lowest such month in 119 years of record. April 2026 at Remington, at 244, is the lowest April in 84 years. The lowest single daily value of the period at Remington was **39.7 cubic feet per second on July 27, 2026**.

Days at or below the fifth percentile of record since October 1, 2024: 63 at Point of Rocks, 43 at Little Falls, **126 near Fredericksburg**, 61 at Remington.

Three caveats, stated rather than buried. All 2026 values carry the USGS provisional qualifier and may be revised. USGS annual statistics for water year 2026 are not present in its statistics service as of August 24, 2026, because the water year is incomplete; the water year 2026 ranks above are a like-for-like October 1 to August 23 comparison computed by the author from the full daily record, not a USGS-published ranking. And Little Falls sits downstream of the

Washington metropolitan water supply intakes, so low flows there reflect withdrawal as well as hydrology and should not be read as a pure climate signal.

14.4 The Roanoke basin and the New River

The four gages above are Potomac and Rappahannock. The western half of the Commonwealth drains south and west as well, and the record there is the same shape.

	Roanoke River at Roanoke	**Roanoke River at Niagara**	**New River at Radford**
Drainage area, square miles	384	509	2,767
Daily record begins	February 1899	October 1926	October 1907
Complete water years	125	99	94
WY2025 annual mean, cfs	321	514	3,624
WY2025 rank, 1 = lowest	49 of 125	47 of 99	39 of 94
WY2026, October 1 to August 23	136	239	2,168
Rank, same window	**4th of 126**	**4th of 100**	3rd of 95
April 2026 rank	**3rd of 128**	**4th of 100**	1st of 95, with the caveat below

The pattern holds across the state. Water year 2025 was near median on every gage examined, east and west. Water year 2026 ranks among the four driest on all of them.

A disclosure that governs the New River column. The Radford gage has a continuous gap in its record from **water year 1916 through 1939**, twenty-four years, computed from the daily values. That window contains the 1930s drought, and 1930 is the driest calendar year in Virginia's statewide precipitation record. The five lowest Aprils at Radford are 2026, then 1942, 1986, 1989 and 1995: every competitor is post-1940 because there are no pre-1940 competitors in the file. **"Lowest April on record" at Radford is therefore measured against a record that excludes the decade most likely to beat it, and this volume does not assert it.** The Roanoke gages carry no comparable gap, and the Rappahannock at Fredericksburg proves it captured the period, because its own lowest water year on record is 1931.

14.5 The reservoirs

The eastern volume recorded the reservoir position as of the Governor's July 16 news conference, held at Smith Mountain Lake: Smith Mountain 5.5 feet below normal, John H. Kerr 4.45 feet.[318] Both figures have moved, and the western reservoirs are where the Commonwealth's remaining drought is concentrated.

Reservoir	Full pond or guide curve	August 24, 2026	Below	Rank
Smith Mountain Lake	795.0 ft, operating band 793–795	790.21 ft forebay, 790.3 adjusted	4.8 ft	not a record
John H. Kerr	guide curve 299.50 ft	291.99 ft	7.5 ft	**2nd lowest August 24 in 70 years**
Philpott Lake	guide curve 972.72 ft	970.51 ft	2.2 ft	30th of 71, normal status
Carvins Cove	6.42 billion gallons full pond	58.9 percent remaining	18.1 ft	see below
Spring Hollow	3.2 billion gallons full pond	77.5 percent remaining	18.2 ft	see below

Smith Mountain is not at a record low, and the figure in circulation is wrong. Appalachian Power publishes annual extremes back to 1966. The record minimum is 787.6 feet, set January 23, 1970, and sixteen of fifty-nine years carry annual minima below the present level.[319] Regional press reporting of a "lowest since 2007" figure is **not present in any AEP, APCo or DEQ document located as of August 24, 2026**, and the company's own table contradicts it: 2012 at 789.03 feet and 2018 at 790.19 were at or below where the lake stands now.

But the drawdown is drought-driven rather than scheduled, and that is documented. Smith Mountain has no seasonal rule curve, only a flat operating band, and Appalachian Power's hydro manager stated in May that "our operations are not guided by a target lake elevation but by hydrologic conditions."[320] The company invoked Water Management Plan Trigger 1 on April 27, 2026 and Trigger 2 on May 11, and implemented **Trigger 3 early on July 22 under a variance from DEQ**, ahead of the September 30 date the plan specifies. Those measures, the company states, "helped conserve approximately two feet of water elevation within the project."[321]

Kerr is the near-record. At 291.99 feet it is second lowest for August 24 across seventy years of Corps of Engineers daily records, behind only 1968, and it was still falling through the third week of August.[322]

And the state's own count is the cleanest statement of where the drought sits. The Drought Monitoring Task Force report of August 18, 2026 lists Smith Mountain and Kerr as **the only two of twenty-nine drought-indicator reservoirs not in Normal status**, both at Warning. The Roanoke Drought Evaluation Region carries the Commonwealth's only drought emergency advisory, at 66.38 percent of normal precipitation since October 1, and its indicator gage at Goose Creek near Huddleston sits at the fourth percentile. The same report carries a USGS slide recording a **Bedford County well at the lowest level in its period of record**, and roughly four Roanoke basin gages setting provisional day-of-year records.[323]

Two cautions. Leesville Lake, at 600.68 feet against a 613-foot top of range, is not evidence of drought: it is the lower reservoir of a pumped-storage pair and sits at the bottom of its designed

daily cycling band, and reading it as a twelve-foot drawdown is a category error.[324] And the Western Virginia Water Authority publishes Carvins Cove and Spring Hollow only as feet below full pond and percent remaining, with no elevation series, so **whether either is at a record low for the date cannot be established from the Authority's published numerics.** The Authority placed all customers under Stage 1 voluntary conservation as of August 24, 2026.[325]

14.6 The monitoring threshold, crossed for a month

Daily drought monitoring of the Potomac begins when flow at the Point of Rocks gage falls below 2,000 cubic feet per second. The Interstate Commission on the Potomac River Basin conducts that monitoring on behalf of Fairfax Water, the Washington Aqueduct and WSSC Water under the 1982 Water Supply Coordination Agreement.[326]

The monthly mean at Point of Rocks in January 2026 was 1,946 cubic feet per second, the fourth lowest January in 131 years of record. The threshold that triggers daily monitoring was not crossed for a day. It was crossed on average, for a month.

14.7 The phrase "second driest," and who said it

The phrase belongs to the Governor's office, in a statement of July 16, 2026, and *Two Systems, One Drought* cites it correctly: "Rain is approximately 7.8 inches below normal on average throughout the Commonwealth. This represents the second driest **water year** on record."[327] DEQ's drought page carries the same language.

An independent check does not reproduce the ranking at second. NOAA National Centers for Environmental Information statewide precipitation for Virginia, 1895 to 2026, gives calendar year 2025 at 43.38 inches, which is 66th driest of 131 and within a tenth of an inch of the 131-year mean. The October 2025 through July 2026 window totals 26.96 inches, which is **fourth driest of 131**, behind 2002, 1966 and 1925. The departure of 8.49 inches below the full-record mean, and 10.31 inches below the 1991 to 2020 normal, is consistent in magnitude with the Governor's 7.8 inch figure.[328]

The two are not necessarily in conflict. DEQ maintains its own precipitation network and its own drought assessment methodology, and the ranking depends on which network and which window. **This volume reports the phrase as the Governor's characterization and gives the NOAA figures alongside it.** DEQ's 2026 drought assessment methodology document, which would reconcile them, has not been read and is listed in Section 17.

What should not be repeated is the phrase attached to calendar year 2025. On every measure examined, statewide precipitation and all four gages, 2025 was unremarkable.

14.8 What the record supports at the hearing

At the August 20, 2026 State Water Commission meeting, the Chesapeake Bay Foundation's Jay Ford put the surface water record to the Commission in support of an argument about sequencing:

> "And I pointed out to them that we have the Rappahannock and the Potomac at historic low levels, that we have just gone through a historic drought here in Virginia, that many people

> are still feeling the impact of our immediate response in water resources management should not be to go create a stressed water issue in another spot."[329]

He said "historic low levels" and "historic drought." He did not say "second driest year on record," and the two statements should not be merged.

His characterization is supported by the gage record set out in Section 14.3, for water year 2026.

Ford also supplied the mechanism this volume is about, and it is his argument rather than the agency's:

> "there are also clear signs that we're going to see surface water stress, which is going to make more people want to go to groundwater, it's a good time for us to take a beat and say, could we be a little more protective."[330]

That is the migration in the opposite direction from the one the eastern volume traces. East of Interstate 95 a tightening groundwater ceiling pushes users onto rivers. West of it, rivers at record lows push users toward an aquifer nobody permits and few people measure.

And Ford named the frame himself, introducing an example: "We've been picking on East of 95, so I'll use the Eastern Shore as an example."[331]

15. Planning Without Data

Virginia is in the middle of a statewide water supply planning cycle that will not produce a document until October 2029. The regulation governing it contains a clause that determines how much the western regions will be able to say.

15.1 The regulation, and a correction to its date

Every operative regionalization provision in 9VAC25-780 derives from an amendment **effective October 9, 2024**, not from any earlier action. Sections 45, 55 and 125 are entirely new as of that date; sections 40 and 130 were repealed the same day; and sections 50, 60, 70, 80, 90, 100, 110, 120 and 140 were all amended then. **No 2020 or 2021 amendment is present in the chapter's historical notes as of August 24, 2026.** That negative is true and does less work than it appears to: 9VAC25-780-70, the existing-water-sources section Section 15.4 relies on, carries an amendment effective **November 23, 2022**, and section 30 carries the 2006 and 2015 amendments.[332]

The distinction is between the statute and the regulation, and it governs how the date should be cited. The 2020 session did pass the enabling legislation, § 62.1-44.38:1, directing the State Water Control Board to adopt regional planning regulations. In DEQ's own account, that legislation "created 26 regional planning areas, subsequently reduced to 25 due to reassignments," and "the amendments to the Water Supply Planning Regulation became effective in October 2024."[333] A citation to 2020 for the statutory duty is correct. A citation to 2020 for the operative regulation is wrong by four years.

15.2 The deadline

9VAC25-780-50(A): "Each locality in a regional planning area shall assist its regional planning unit in developing and submitting a single jointly produced regional water supply plan to the department **within five years from October 9, 2024**."[334]

DEQ states the resulting date: "Oct. 9, 2029 - Plan Submission Deadline."[335] Two subsidiary deadlines have already passed: designated representatives were due December 8, 2024, and DEQ kickoff meetings were to be convened by April 7, 2025.

Thereafter, a five-year review and a full revision every ten years.

15.3 The twenty-six regions

Section 45(B) designates 26 regional planning areas. The four relevant here:

Northern Virginia is a single area comprising Fairfax, Loudoun and Prince William counties and the cities of Alexandria, Arlington, Fairfax, Falls Church, Manassas and Manassas Park.

The Piedmont is two: Northern Piedmont 1, comprising Culpeper, Fauquier, Madison, Orange and Rappahannock, and Northern Piedmont 2, comprising Spotsylvania and Stafford with the City of Fredericksburg.

The Shenandoah is two: Shenandoah River 1, comprising Augusta and Rockingham with Harrisonburg, Staunton and Waynesboro, and Shenandoah River 2, comprising Clarke, Frederick, Page, Shenandoah and Warren with Winchester.

Southwest Virginia is two, with several adjacent western areas.[336]

A caveat for anyone citing the roster. Section 45(C) permits a locality to petition to move to an adjoining area, and DEQ approved ten reassignments between February and June 2025, including Rockbridge and its cities moving between the two Upper James areas, Alleghany and Covington moving the other way, and Floyd and Bland trading New River areas. One area, York and James River 1, was dissolved. **DEQ's own current count is 25 rather than 26**, and its report refers throughout to "the 25 newly established regional planning areas."[337] The codified roster and the operative roster differ, and both should be cited.[338]

15.4 What a plan must contain

Nine elements, of which four bear on this volume.[339]

Source of supply is granular and mandatory. For stream intakes, a plan must state among ten items "the lowest daily flow of record" and "the safe yield." For reservoirs, drainage area, storage available for supply, safe yield, and any withdrawal limitations established by departmental permits. Section 8.2 established that no such permit limitations are present for Fairfax Water's two intakes, in the corpora searched there as of August 24, 2026.

Demand must be projected thirty years out, reported at the beginning of each decade.

A statement of need is required, and its terms are worth quoting:

> "The statement of need shall contain, at a minimum, a determination of whether the existing sources are adequate to meet current and projected demands. If the determination is that existing sources are inadequate to meet current or projected demands during the planning period, each local government shall identify a reasonable range of potential alternative sources of supply to address the shortfall in demand."[340]

And an alternatives analysis is triggered whenever a locality finds a source inadequate. It must include "nontraditional means of increasing supplies, such as interconnection, desalination, recycling, and reuse" and "cross-jurisdictional regional approaches," and must assess whether alternatives are available and practicable in cost, logistics and existing technology.

15.5 The clause that decides how good the western plans can be

9VAC25-780-50(C) applies to "[a]ny information required to be collected, compiled, or provided **by a local government**," and provides that it "shall be derived from **existing, readily available information. Additional studies shall not be required.**" Plans "shall document any known information gaps."

The same subsection defines what counts as readily available, and one clause cuts against the reading that follows: information is readily available if it is in the locality's possession, provided by the department, available from a website or electronic database, or "**provided by a third**

party in response to a written request from the local government." A planning unit can therefore compel a third party to hand over what it already holds. What it cannot do is require that the missing work be done.[341]

Set that against Sections 5 and 7. In the Northern Virginia planning area, existing readily available information about groundwater consists of annual reports filed by users above ten thousand gallons per day, no withdrawal permits of any kind, at least fifty-five monitoring wells, a minimum rather than a count for the reason given at Section 7.6, spread across four physiographic provinces, and no calibrated predictive model. In Northern Piedmont 1, which contains Fauquier, the position is the same.

A regional planning unit in Loudoun cannot state a groundwater safe yield because none has been computed. It cannot state what large users withdraw because the data are aggregated at the utility intake. It can document the gap, which the regulation requires, and it is expressly relieved of doing the work that would close it.

The regime designed to make the Commonwealth's water legible declines, in terms, to fund the studies that would make the western half legible. The plans will be accurate and they will be thin, and the thinness is a regulatory choice rather than an oversight.

15.6 Where the western regions stand

No regional water supply plan submission and no State Water Control Board compliance determination is present in the corpus below as of August 24, 2026. This is expected rather than a failure: nothing is due until October 9, 2029.

Corpus searched, all retrieved August 24, 2026: DEQ's water supply planning hub and its resources, meetings and regional planning frequently-asked-questions pages; the Virginia Water Resources Plan page; DEQ's State Water Control Board page; and Virginia Regulatory Town Hall meeting searches filtered by the State Water Control Board across all past and future meetings, and separately by titles containing "water supply" across all agencies.[342]

What has happened is kickoff meetings. Every western and northern region held one between February and April 2025, ending with Northern Virginia on April 16, 2025. **Shenandoah River 2 has no public DEQ kickoff record**, which DEQ attributes to the provision under which a planning district commission may notify the department that it will coordinate the process itself. Regions led by planning district commissions sit outside DEQ's meeting paper trail, which is worth knowing before anyone reads their absence as inactivity.[343]

Guidance issued November 8, 2025. A fiscal 2027 grant round closed August 14, 2026, against $1,962,000 appropriated in the 2026 session.[344]

A note on citations. DEQ paths under `/water/water-supply-planning/` return a not-found error. The live paths run under `/water/water-quantity/water-supply-planning/`. Inherited citations to the former should be corrected.

16. A Note on Negative Findings

This volume states negative findings by naming the body of material searched and the date searched, rather than asserting that a record does not exist. The discipline has a failure mode worth recording: a negative is only as good as the boundary of the thing searched, and the person who drew that boundary is the least likely to notice when it is drawn in the wrong place. Where this volume names a corpus, it names what was actually reached rather than what was intended.

17. What This Volume Cannot Establish

17.1 What it does not establish

It does not establish that any western locality is running short of groundwater. Sections 6 and 7 establish that the Commonwealth lacks the instruments to know. That is a claim about measurement rather than about scarcity, and the two should not be run together.

That said, Section 7.8 records an assessment that does make the scarcity claim for Loudoun County, and this volume neither adopts nor dismisses it. Its authors are qualified, its data are the county's and the federal government's, and its conclusion is unambiguous. It is also a coalition product, unreviewed, resting a countywide trend on a thin observational base. **The honest position is that the strongest available statement about western groundwater decline was made by residents rather than by the Commonwealth, and that the Commonwealth has not produced the instrument that would confirm or refute it.** The paragraph N study, due December 31, 2026, is the first time it will try.

It does not establish that Northern Virginia data centers use groundwater. Section 8 establishes that they are utility customers on surface water. Section 5 establishes that the absence of groundwater permits in Loudoun is a boundary artifact carrying no information either way. Both are true, and neither licenses a claim about unobserved withdrawal.

It does not establish the magnitude of western groundwater withdrawal. Users above ten thousand gallons per day file annual reports, and this volume did not obtain and analyse that dataset.

It does not establish that DEQ has acted improperly. The agency commissioned the study, published a blunt finding, told the legislature in public that its model does not cover the whole management area, and asked for authority it does not have. The gap this volume describes is largely statutory.

And it does not establish that the 2026 session did nothing. Section 10 sets out a statewide disclosure duty, a second statewide reporting channel with an October 2026 deadline, and an unbounded scarcity-area authority. The volume's claim is that the instrument which binds today stops at a highway, not that the field is empty.

The thesis-level concession. Sections 2 through 7 describe the territorial regime in detail, and the load is not on groundwater. It is Potomac and Occoquan surface water bought retail. Those sections describe a contingent regime rather than the operative one, and a reader who takes them as an account of what governs Northern Virginia's data center water will be misled. §8, §8a and §5 carry the operative account. **The boundary computation rests on a road centerline and a single inventory.** The centerline is OpenStreetMap data, reduced to one profile by averaging both carriageways within latitude bins; divergence between carriageways runs to 750 meters at the extreme. The inventory holds 286 named facilities against a summary count of 450 or more in Loudoun alone, so the outside share is a floor rather than an estimate. Twenty-one facilities sit within three kilometers of the line and their classification is not robust.

The Fall Line in this volume is derived, not published. No Virginia agency publishes the contact as a line feature. It is extracted here from the state geologic map at 1:500,000, whose positional precision is on the order of 250 meters, and four of the computed crossings bound excursions too short to separate from map error, and two further pairs are close enough to merge under a small shift in the traced contact. The volume reports at least six crossings and does not publish a precise count.

The Rappahannock cooling permit at King George has no published numbers. DEQ's own documents describe VWP 17-0702 qualitatively and supply no issuance date, expiration date, permittee of record or volume limit. A figure of 6.6 million gallons per day through 2034 circulates in press coverage attributed to DEQ and is not traceable to any DEQ document in the corpus searched. Closing this requires a records request.

Transcript provenance. Every quotation from the August 20, 2026 hearing comes from a corrected caption track. The volume does not establish who corrected it or against what.

Figures read from images. Loudoun Water's data center numbers were read from published infographics rather than from tabular data, and they produce the peaking ratio that §9.1's sensitivity table uses.

The Kerr splice. The seventy-year ranking joins Corps of Engineers elevations from 1953 to 2022 to USGS gage data from 2023 to 2026 without establishing datum comparability.

The Fauquier monitoring anomaly is unexplained. Well 48U 26 shows a step change beginning September 2025 and a decline through July 2026 exceeding three times its historical seasonal range, with provisional readings after July 21, 2026 holding at a constant value. Drought and nearby withdrawal both fit the signature, and so does a transducer at a range limit. The volume describes the record and asserts no cause.

The Fauquier and Prince William interconnection has no located agreement. No executed water purchase, capacity or wholesale service agreement is present in either party's published corpus. The project is funded, designed and procured on one side of the transaction and appears once, as a progress note, on the other.

Two datasets were never obtained. The annual withdrawal report dataset is the one that could quantify western groundwater withdrawal. The state dashboard's row-level facility table is the one that could show a facility reporting withdrawals without holding a permit; it sits behind a terms-of-use agreement containing an indemnification clause that was not accepted. No claim of presence or absence is made about either.

DEQ's edge returned errors throughout. Several findings rest on mirrors and republication rather than on DEQ directly, and DEQ unpublishes draft permit packages after comment periods close. Documents cited here may not be retrievable at the URLs given.

17.2 What would have to be true for the central argument to be wrong

If the paragraph N study finds no threat. DEQ's report is due December 31, 2026 and must evaluate whether a groundwater management area should be established for western Loudoun

and Fauquier. A finding of adequate supply, or a recommendation against designation, would not falsify the regulatory account in Sections 3 through 5, but it would substantially weaken the argument that the gap matters.

If DEQ designates a Cooling Water Scarcity Area reaching Loudoun before July 1, 2027. The authority is unbounded on its face. Section 12 establishes that nothing has been filed. If the criteria as promulgated reach the data center corridor, the central asymmetry closes without legislation.

If the reclaimed share rises faster than the load. Loudoun Water served 40 of 206 data centers with reclaimed water in 2025. If that fraction grows quickly, consumptive use could fall against a rising building count. Section 9 gives the reason for caution: across the whole range it derives, reclaimed water reduces potable demand without reducing evaporative loss, because the loss occurs downstream of the substitution.

If the western aquifers hold more than the published values suggest. Section 6 rests on a specific yield of approximately 0.01 in Clarke County karst and on the absence of any published crystalline-rock storage parameter for Virginia. A competent transient study of the Piedmont could return values that make the seasonal-failure account too pessimistic.

Three of those four will be substantially resolved within eighteen months.

The §10.2 construction is the author's, and the argument survives either reading. Section 10.2 sets out the counterargument at length. On the narrow construction the Department cannot designate a Cooling Water Scarcity Area outside the Eastern Virginia Groundwater Management Area and the gap is permanent. On the broad one it can, and the gap is contingent on the Department choosing to close it. The construction determines whether the gap can be closed without further legislation. It does not determine whether the gap exists.

17.3 Open data gaps

A named list of Loudoun Water reclaimed water customers. Not present in the published corpus. Would require a records request.

Fairfax Water's data center figure. Board minutes establish that the utility tracks it. The number has not entered the public record.

Whether any groundwater management area petition has ever been filed for a locality west of Interstate 95. Still not established. Section 13.5 sets out who may file and why the 2026 Loudoun campaign had to route its request through the Board of Supervisors. What has not been searched is State Water Control Board minutes, which is where a petition that produced no regulatory action would appear. The *Virginia Register* would record such a petition only if it generated a notice of intended regulatory action, and none was found.

Piedmont and Blue Ridge terrane yield statistics. The Valley and Ridge compilation is in hand. The Piedmont and Blue Ridge equivalent, USGS Hydrologic Atlas 730-L, is published as running text as well as plates, and Section 6.2 quotes it directly.[109] What has not been assembled is a terrane-by-terrane yield table for Virginia of the kind the Valley and Ridge compilation

provides. The atlas reports its well-yield statistics by aquifer type across a seven-state segment rather than by Virginia terrane, so the two are not interchangeable.

A Virginia crystalline-rock storage parameter. Section 7.7 treats the absence as a scoped negative, and the scope has now been tested in three directions rather than asserted.

Water Supply Paper 2457, the most directly relevant Virginia publication, was located. Its abstract and citation establish that it treats base-flow characteristics as an indicator of potential yield where specific-capacity data are lacking, not aquifer storage. **No accessible full text is present at pubs.usgs.gov as of August 24, 2026**; four candidate paths returned either a redirect to the landing page or a not-found response. The scope determination therefore rests on the abstract rather than the report.

The Virginia Energy geology publications page **was not reachable** on August 24, 2026, returning an empty response. That catalogue remains unsearched, and this volume does not treat a failed fetch as an absence.

The reference lists of the Loudoun and Fauquier assessments were not mined. The Loudoun assessment cites work on fractured metamorphic rock in the Blue Ridge province of northern Virginia that this volume has not read.

The negative as now stated is narrower and survives: no published Virginia crystalline-rock storage or specific-yield value was located in the corpora searched. It should not be broadened without checking the Virginia Energy catalogue and the two assessments' reference lists.

DEQ's 2026 drought assessment methodology document. Not read. It is the only path to reconciling the Commonwealth's "second driest water year" with the fourth-driest national ranking.

The row-level facility table on DEQ's withdrawal dashboard. Behind a terms-of-use agreement containing an indemnification clause, which was not accepted. It is the one public dataset that would show a facility reporting withdrawals without holding a permit, and **no claim of presence or absence is made about it**.

The Manassas grandfathered rights review. Press only. No agency or city primary document was retrievable, and Prince William Water's five million gallon per day contract depends on the outcome.

Whether the SJ 25 predictive simulation carries SWIFT recharge. Not established. The maximum-passing withdrawals this volume relies on, including the 60,000 gallons per day at the Northwest Coastal Plain centroid in Caroline County, come from a fifty-year projection. Across that same horizon the Hampton Roads Sanitation District's Sustainable Water Initiative for Tomorrow is scheduled to bring 50 million gallons per day of recharge capacity into the Potomac aquifer, which its presentation puts at 32 on the 65 percent basis its contracts use. How much of that recharge reaches the northwestern margin, roughly a hundred miles up-dip of the injection fields, is a second unquantified quantity and it is not the full fifty. The SJ 25 report as read for this volume does not state whether its predictive run includes that recharge, and the question was not

put to DEQ. **If the run excludes it, the centroid figures are conservative by an amount not quantified here, and Section 7.3a records that Mission H2O's presentation is entitled to say so.** If the run includes it, the figures already account for the program and the point falls away. Closing this requires either the model documentation or a question to the Office of Water Supply.

One item pending at the time of printing. Whether the paragraph N contract has been signed, and by whom.

18. What to Watch

In the order they fall due.

October 1, 2026. The State Corporation Commission's first annual report under Item 477, paragraph D, including data center water usage information from municipal and private water providers, statewide.

October 15, 2026. DEQ's study and plan on retrofitting existing Eastern Virginia Groundwater Management Area data centers. The first document located in this research in which the agency must take a position on what "closed loop" means, against DEQ permits, guidance and regulations as searched on August 25, 2026, and Section 11 explains why that definition now matters more than it would have under the enrolled text.

October 2026. The State Water Commission reconvenes. The chair asked DEQ to return with one to three prioritized bills, and a member asked that the Commission vet legislative and budget language before session. Legislation is coming in 2027.

November 30, 2026. DEQ's meetings on western Loudoun and Fauquier groundwater are to be complete.

December 31, 2026. The paragraph N report is due to the chairs of the House Committee on Agriculture, Chesapeake and Natural Resources and the Senate Committee on Agriculture, Conservation and Natural Resources. Clause (iv) requires it to evaluate whether a groundwater management area should be established for the region. **Within Item 366 this is the only paragraph that contemplates extending management area status to the data center corridor.**

January 1, 2027. Two things at once. Chapters 623 and 896 take effect and suppliers begin itemizing data center water. And the Eastern Virginia air-permit cooling trigger begins, in the form the Governor's amendment left it.

The 2027 session. Senate Bill 417 on reclaimed water for grant recipients, Senate Bill 521 on rainwater harvesting, and three further bills carried over. Section 8.2 records a utility already organizing against one of them.

July 1, 2027. The Cooling Water Scarcity Area criteria are due, by amendment to 9VAC25-780, exempt from the Administrative Process Act and without State Water Control Board action. Whether the criteria are drawn to reach west of Interstate 95 is the single most consequential open question in this volume.

July 1, 2032. On a literal reading, the Cooling Water Scarcity Area obligation lapses.

October 9, 2029. Regional water supply plans are due from all 25 planning areas, subject to the clause in Section 15.5.

Unscheduled, and the largest of them. Whether the Governor calls a special session. Senators Stuart and Perry requested one on July 30, 2026, on the ground that the General Assembly enacted the biennial budget without having seen the report. As of August 21 there had

been no public response. A special session would put every provision in Section 10 back on the table, and it would do so with the study in hand.

And continuously. Whether the paragraph N contract is signed, and how much of a four-month study survives a procurement that had not closed four months before the report was due.

Appendix C. The 1993 surface water management area proceedings

Headnote. This appendix is the evidentiary basis for §13.1 and §13.6. It is preserved in full because the claim that the Chapter 24 authority is dormant rather than repealed rests on it, and because no other account of these proceedings assembled from the primary record was located in preparing this volume.

C.1 April 1993: three proceedings at once

On April 19, 1993 the State Water Control Board published notices of intended regulatory action opening **three** Surface Water Management Area proceedings simultaneously.[345]

Docket	Area	Petitioner	Public meeting
VR 680-15-04	The Shenandoah River, including the portions of the North Fork and South Fork within Warren County	Boards of Supervisors of **Clarke and Warren Counties**	May 26, 1993, Berryville
VR 680-15-05	The North River and tributaries above the confluence with the Middle River	The Town of Bridgewater, through counsel	May 20, 1993, Harrisonburg
VR 680-15-06	The James River, Richmond metropolitan area	**Henrico County** Board of Supervisors	May 24, 1993, Glen Allen

Each notice recited the same rationale: "Surface water management areas are needed where low flow conditions threaten, or could threaten, beneficial stream uses. The Code of Virginia, § 62.1-246, provides local governments the right to petition the board for consideration of surface water management areas."

A textual note for anyone working from the original. The estimated impact paragraph of the Shenandoah notice as printed erroneously reads "from the James River in the Richmond metropolitan area," evident contamination from the parallel James River notice on the facing pages. The corrected reissue reads "from the area."

C.2 How far the Shenandoah proceeding got

An advisory group was convened. The *Virginia Register* calendar announces "a series of meetings of the Shenandoah River Surface Water Management Area Advisory Group," beginning July 27, 1993 at the Clarke County Administration Office in Berryville, with further meetings tentatively set for August 31 and September 28. Its charge was "to assist in determining the appropriateness of a designation, the boundaries of the proposed area, and the adequacy of data," and to "evaluate the data to determine the minimum instream flow level that will activate the surface water withdrawal permits."[346]

The notice was then reissued in full on September 6, 1993, because "changes in the Administrative Process Act which were enacted during the 1993 General Assembly" required restarting the adoption process. The reissue estimated **15 affected withdrawers**, permit fees up to $3,000 and certificate fees of $2,000, and stated that the Board intended an informational proceeding and "does not intend to hold a hearing (evidential)."[347]

And then it stops. A systematic full-text sweep of the *Virginia Register of Regulations*, Volume 9 issues 16 through 26 and Volumes 10 through 14 in their entirety, comprising 115 issues, searching for the three docket numbers and for the area names, returns **no further Shenandoah entry after Volume 9, Issue 25 of September 6, 1993**. No proposed regulation, no final regulation, and no published withdrawal notice.[348]

The asymmetry within the trio is the part worth noticing. The other two dockets kept moving. DEQ was still convening the North River advisory group in Bridgewater on October 26, 1995, and the James River advisory group in Richmond on December 6, 1995 and January 24, 1996. The Shenandoah group has no counterpart notice in that window.[349]

C.3 Why it lapsed

Not established. No withdrawal notice, no board minutes, and no explanatory document stating a reason is present in the *Virginia Register* Volumes 9 through 14, in 9VAC25-220, or in DEQ's August 8, 2001 periodic review, as of August 24, 2026. The only procedural disruption on the record is the 1993 Administrative Process Act amendment that forced the restart, and a restart is not an explanation for a three-year silence when two parallel dockets survived the same amendment.

Tracing further would require State Water Control Board minutes and DEQ Valley Regional Office files, neither of which is online. **This volume does not supply a reason, and readers should be suspicious of any account that does.**

The 2001 periodic review offers the only official gloss on the program's general inertia, and it is about the legislature rather than the agency: "Efforts to develop a comprehensive water policy have been largely unsuccessful due to the reluctance of the General Assembly to assert state control over the allocation of Virginia's water resources."[350]

Endnotes

[1] Va. Code § 62.1-44.15:22(B); 9VAC25-210-310(A)(1)(b). A withdrawal in existence on July 1, 1989 requires no Virginia Water Protection permit, and capacity information supplied to the Department "shall not constitute a limit on the exempted withdrawal."

[2] 9VAC25-200-10, definition of "user": "The purchase of water from a waterworks by a customer of it does not constitute a withdrawal."

[3] See the note to Section 1 setting out the computation, its corpus and its precision tiers.[11]

[4] "Power and water key issues with King George data center plan," *The Free Lance-Star*, 2023, reporting that DEQ directed King George County to reduce its reliance on the Potomac aquifer and move its drinking water supply to the Rappahannock River, a transition the county put at $100 million. **Press, and the weakest citation in this volume.** The body could not be opened from this research environment because fredericksburg.com blocks automated retrieval; the sentence was recovered by search-engine extraction and the publication date was not resolved. It is treated here on the same footing as notes [243] and [247] and must be confirmed against the printed article, or replaced with a King George County water supply planning document, before deposit.

[5] Fauquier County, drought information page, updated August 6, 2026: the county "remains in an overall Drought Warning despite improvements in some areas. Groundwater (well water) levels remain in the Emergency status." Compare Virginia Drought Monitoring Task Force, *Drought Status Report*, August 18, 2026, page 1, listing four groundwater indicator wells for the Northern Virginia evaluation region, none of which is in Fauquier County, and reporting 11 of 24 statewide indicator wells below the fifth percentile and 39 systems statewide under mandatory measures.

[6] Turner, T.N., *Two Systems, One Drought: Virginia's Groundwater Ceiling, Its Rivers, and the Water the Energy Buildout Actually Uses*, version 1.4. Cite all versions: 10.5281/zenodo.21816008.

[7] 9VAC25-200-30(A)(1); Va. Code § 62.1-44.38(C). The registration and annual reporting duty attaches to any user withdrawing more than ten thousand gallons a day in any single month, statewide, with no geographic qualifier.

[8] DEQ, *Annual Water Resources Report*, December 2025, reporting year 2024. Unpermitted withdrawals were approximately 78 percent of total reported withdrawals excluding power generation, and 81 percent of reported surface water withdrawals.

[9] Va. Code §§ 62.1-259(ix), 62.1-262, 62.1-266(C) and (G); 9VAC25-610-50(9), -102 and -108. Section 62.1-259(ix) excludes from the permit requirement "the withdrawal of ground water in any area not declared a ground water management area," with no volume, use or aquifer qualifier.

[10] Va. Code § 62.1-44.15:22(B) proviso; 9VAC25-210-310(B). A permit is required where a new federal certification is needed to increase a withdrawal, and the Department retains a residual authority to require a grandfathered user to cease and apply where impairment occurs. **Scoped negative finding:** no instance of the Department invoking that residual authority against a public water supply was located in the course of this research; no comprehensive corpus of Department enforcement actions was searched, and the finding is stated as a limit on this research rather than as a fact about the Department's practice.

[11] Author's computation from the project Master Inventory (March 2026), 286 geolocated rows, tested against the locality roster of 9VAC25-600-20(A) and, for the eight split counties, against an Interstate 95 centerline covering the highway's full Virginia extent from latitude 36.5452 to 38.7936. Precision tiers are 158 exact, 98 approximate and 30 county-level. The county-by-county distances to Interstate 95 and the marginal-case sensitivity are held with the author's research file. The inventory carries 286 named facilities against a summary count exceeding 450 in Loudoun alone; because that undercount falls in a county entirely outside every declared area, the reported outside share is a floor. **The computation is a facility count and not a measure of capacity; this volume holds no megawatt data and makes no capacity claim.**

[12] Author's computation, same source and same centerline. Per-county minimum distances to Interstate 95: Fairfax 12.65 km, Prince William 20.69, Fauquier 24.82, Loudoun 30.81, Culpeper 45.44. Every Loudoun facility lies north of latitude 38.7936, where Interstate 95 leaves Virginia.

[13] See the note to Section 2.2 and the note to Section 8a.1 for the derivation of the contact and the crossing computation.

[14] DEQ, *Draft Permit Issuance Fact Sheet, Groundwater Withdrawal Permit GWI000502*, and DEQ public notice, comment period August 12 to September 11, 2026; predecessor permit GW00187EU. **Author's calculation:** 6,400,000 divided by 365 is 17,534 gallons per day. DEQ attributes an estimated ninety percent to human consumptive use, derived as 35 gallons per employee per day across 450 employees. The permittee of record for VWP 17-0702 is not published; Birchwood Power Partners, L.P. is treated as permittee of record throughout this volume as a working convention, and Section 8a.5 states the basis and the limit of that treatment.

[15] DEQ groundwater withdrawal permits GWI000471, GWI000607, GWI000495 and GWI000470. These four permits establish the source aquifer for the systems they cover, being Bowling Green, Hopyard Farm, Presidential Lakes, and Elsinore and Ruther Glen. They are not a complete inventory of every public supply well in the two counties, and no claim is made here about systems outside them.

[16] DEQ, *Senate Joint Resolution No. 25: Groundwater Supply East of Interstate 95*, July 2026. Nine sites tested at three million gallons per day; none passed. The Caroline County centroid returned 60,000 gallons per day. Thirty thousand gallons per day was the lower limit of the simulation rather than a floor on the aquifer, and Section 7.3 states that qualifier.

[17] *VWP Individual Permit No. 20-0514*, Caroline County Department of Public Utilities, signed November 26, 2025, expiring November 25, 2040. Cover page and Part I.D.2: maximum 9.0 Mgal/d and 237 Mgal per month. The annual figure is internally inconsistent in DEQ's own instrument, 1,832 Mgal on the cover page against 1,862 Mgal at Special Condition I.D.2.e and at page 19 of the Permit Decision Rationale; both are reported and neither is adopted. Part II.B.1 sets a fifteen-year term and Part II.D bars modification to extend beyond it. Part I.D.2.b and c curtail to 7.0 and then 6.0 Mgal/d on declared drought. Retrieved in full, 1,077 pages, from DEQ published document 32549 on August 25, 2026.

[18] Project Master Inventory summary sheet, March 2026. Summary counts for the northern crescent against the named-facility inventory used for the computation at note [11].

[19] Project Master Inventory, March 2026, named-facility rows west of the Blue Ridge front: one operating facility in Wise County, one in Scott County, and one proposed in Botetourt County. The summary counts for the northern crescent are a separate sheet and a separate geography; see note [18].

[20] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 366, paragraphs N and O. Paragraph N funds the study of western Loudoun and Fauquier due December 31, 2026; paragraph O confines its recharge study to "wastewater treatment facilities in the Eastern Virginia Groundwater Management Area."

[21] 9VAC25-600-20. Statutory Authority: § 62.1-256 of the Code of Virginia. Retrieved August 23, 2026.

[22] Virginia Department of Environmental Quality, "Ground Water" withdrawal program page: "There are two designated Groundwater Management Areas known as the Eastern Virginia Groundwater Management Area and the Eastern Shore Groundwater Management Area." Retrieved August 23, 2026.

[23] 9VAC25-620-10, captioned as repealed. Full chapter list for Title 9, Agency 25 retrieved and reviewed August 23, 2026.

[24] VR680-13-05, later codified at 9VAC25-620-10, "Order Declaring the Eastern Shore of Virginia — Accomack and Northampton Counties — As a Critical Ground Water Area," effective November 1, 1976 under the Ground Water Act of 1973. Historical note: "Derived from VR680-13-05, eff. November 1, 1976; repealed, Virginia Register Volume 29, Issue 26, eff. October 10, 2013."

[25] 9VAC25-600-20, historical note: "Derived from VR680-13-04 § 2, eff. December 6, 1989."

[26] Strike-through text, *Virginia Register of Regulations*, Volume 29, Issue 26 (August 26, 2013), VA.R. Doc. No. R13-3601.

[27] *Virginia Register of Regulations*, Volume 29, Issue 26 (August 26, 2013), VA.R. Doc. No. R13-3601, filed August 7, 2013, fast-track, effective October 10, 2013.

[28] *Virginia Register of Regulations*, Volume 30, Issue 5 (November 4, 2013), VA.R. Doc. No. R09-1782, filed October 11, 2013, final, effective January 1, 2014.

[29] *Virginia Register of Regulations*, Volume 30, Issue 18 (May 5, 2014), VA.R. Doc. No. R14-3964, filed April 15, 2014, exempt under § 2.2-4006 A 3, effective June 4, 2014.

[30] 9VAC25-600-20(C).

[31] Virginia Department of Environmental Quality, *Senate Joint Resolution No. 25: Groundwater Supply East of Interstate 95*, July 2026, page 3. The full passage: "The I-95 corridor runs along the east side of the Fall Zone, so that a strip of VCP sediments lies between [the Fall Zone and the highway] ... For the purposes of the SJ 25 groundwater study and report, this strip is disregarded, and I-95 is treated as the approximate western edge of the VCP aquifer system." **Primary.** Retrieved from the report held in the project corpus, 144 pages, August 25, 2026.

[32] Virginia Department of Environmental Quality, *Senate Joint Resolution No. 25*, page 4 and Figure 2 at page 3. "Similarly, I-95 generally defines the western edge of the Eastern Virginia GWMA. The Virginia Administrative Code specifies the localities that make up the Eastern Virginia GWMA and the Eastern Shore GWMA. These geographic areas are subject to Virginia's Groundwater Withdrawal Regulations. Both GWMAs are illustrated on Figure 2. The Eastern Virginia GWMA includes a few small areas west of I-95 and excludes a few small areas east of I-95. The portions of the VCP that are located outside the GWMA are indicated by diagonal stripes on Figure 2. These minor divergences between physiographic, administrative, and regulatory boundaries are noted for clarity but do not appreciably affect the results of the analyses." Figure 2 is captioned "Map of the Virginia Coastal Plain study area east of I-95, including geological features, physiographic boundaries, administrative boundaries, regulatory groundwater management areas (GWMAs), and groundwater flow model domains." **Primary, and the passage most adverse to a careless reading of this volume's boundary finding.** Section 2.2 sets out why the sentence is correct as to DEQ's analyses and does not reach the permitting question.

[33] Virginia Department of Environmental Quality, *Eastern Virginia Groundwater Management Advisory Committee 2025 Annual Report*, December 2025, meeting of June 26, 2025, summarizing the presentation of Brian Campbell, P.G., DEQ Groundwater Monitoring and Characterization Program Manager, "Coastal Plain Groundwater Monitoring Network Assessment": "Mr. Campbell shared a graph plotting time (days) when the levels began to rise in wells resulting from the shutdown versus the wells' distance (miles) from the mill. This relationship, coupled with groundwater level contour mapping demonstrated a response rate of approximately 70 miles per year. He followed this discussion with corroborating evidence from groundwater flow modeling." **Primary.** The figure describes the Potomac aquifer in the Coastal Plain and is not offered as evidence about the crystalline rock west of the Fall Line. Retrieved from deq.virginia.gov August 25, 2026. The underlying presentation was not obtained; this note cites the committee's own summary of it.

[34] Virginia Department of Environmental Quality, *Eastern Virginia Groundwater Management Advisory*, Introduction: "The Eastern Virginia Groundwater Management Area includes all of the Commonwealth east of Interstate 95, except for the Eastern Shore, which is a separate groundwater management area." The report footnotes that sentence to 9VAC25-600-20(A), which is the locality list quoted at the head of Section 2. The report is submitted to the Governor, the General Assembly and the State Water Commission under Va. Code § 62.1-256.2(C), and forms part of DEQ's Consolidated Report under § 10.1-1183.1. **Primary.**.

[35] Virginia State Water Commission, meeting of August 20, 2026, video time 2:29:44–2:30:07. **Recording.** Senate of Virginia broadcast archive, youtube.com/watch?v=WTkFJio-foo, total running time 3:42:25, the meeting itself beginning at video time 1:04:10. All video times cited in this volume are measured from the start of that recording rather than from the start of the meeting. **Caption provenance.** Quotations are taken from the corrected caption track carried with that posting, retained in the working corpus for this

series as "Senate of Virginia State Water Commission on 20260820 transcript.txt." No retrieval date was recorded for the recording. Who corrected that track, and against what audio, is not established; Section 17.1 states the limitation and it applies to every quotation from this hearing. **Official record.** The meeting is listed on the General Assembly's interim studies site as State Water Commission, August 20, 2026, 10:00 a.m., Senate Room 305/A, General Assembly Building, Richmond, with six documents attached: the electronic meeting policy, the updated agenda, DEQ's "SJR 25 Summary of Recommendations" presentation, DEQ presentations on sewer overflows and on PFAS, an "Assessment of SJ25 Ground Water Report" by Troutman Pepper Locke, and comments of the Chickahominy Tribe. That page corroborates the date, time and place independently of the recording. **No minutes and no official transcript are posted**, which is why the caption track is the only source for verbatim quotation. Speaker names in these notes are corrected against the Commission's own membership roster rather than taken from the caption track. Michael Rolband, Director, Department of Environmental Quality, in colloquy with Delegate Keith Hodges. Corrected caption track. The exchange is a four-turn colloquy and both speakers are on the record; the substance is confirmed by Hodges restating it as "rocks" against "sediment."

[36] Virginia State Water Commission, August 20, 2026, video time 2:28:06–2:28:22. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation. The speaker is Senator Bill DeSteph. The chair recognizes him at 2:26:21 ("Yeah. Senator. DeSteph."); he begins at 2:26:29 ("Thank you, Mr. Chair"); no intervening speaker is recognized through 2:28:22. His own framing corroborates the identification: he describes SWIFT appearing on Hampton Roads water bills and cites a service population of 1.6 to 1.8 million. Rolband's assent is a single word.

[37] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 366, paragraph Q.

[38] Va. Code § 62.1-259.

[39] 9VAC25-610-50, items 1 and 9. Historical notes: derived from VR680-13-07 § 1.5, eff. September 22, 1993; amended eff. January 1, 2014; Volume 38, Issue 3, eff. October 27, 2021; Volume 39, Issue 5, eff. November 23, 2022.

[40] 9VAC25-610-40(A).

[41] Va. Code § 62.1-258.

[42] Virginia Department of Environmental Quality, "Ground Water" withdrawal program page, retrieved August 23, 2026.

[43] Virginia Department of Environmental Quality, *Eastern Virginia Groundwater Management Advisory*, meeting of March 27, 2025, summarizing the presentation of Matt Kearns, United States Geological Survey, on the then-pending publication *Estimated Hydrogeologic, Spatial, and Temporal Distribution of Self-Supplied Domestic Groundwater Withdrawals for Aquifers of the Virginia Coastal Plain*, with Jason Pope of USGS as co-author. "Domestic groundwater withdrawals account for around 1/3 of the water demand across the Coastal Plain and are estimated to include 200,000 wells. Since the withdrawals are individually small, they do not require a permit, however collectively they add up to quite a large cumulative draw." The 80 gallons per capita and 38 million gallons per day figures are from the same summary. **Primary** as to the committee record; the USGS publication itself was not obtained.

[44] 9VAC25-600-20, retrieved and reviewed in full August 23, 2026.

[45] Va. Code § 62.1-266(G).

[46] Va. Code § 62.1-262.

[47] 9VAC25-610-102 (need and alternatives), -108 (area of impact), -110 (evaluation criteria), Part V (public notice and comment).

[48] Va. Code § 62.1-266(C), (D).

[49] 9VAC25-610, Part VI; Va. Code § 62.1-266(E).

[50] Va. Code § 62.1-266(F).

[51] Va. Code § 62.1-258.

[52] 9VAC25-610-42(A): "Each certified water well systems provider shall register with the department each private well … that is constructed in a groundwater management area after September 22, 2016."

[53] 9VAC25-610-42(D).

[54] Va. Code § 62.1-259.1; 9VAC25-610-44(A).

[55] Va. Code § 62.1-258.1 (2020, c. 670).

[56] 12VAC5-630-30(B): "This chapter applies to owners of a private well." Statutory authority §§ 32.1-12 and 32.1-176.4.

[57] 12VAC5-630-220(B), (D).

[58] 12VAC5-630-310.

[59] Va. Code § 32.1-176.3.

[60] 12VAC5-630-60.

[61] Va. Code § 62.1-258.

[62] Va. Code § 54.1-1129.1.

[63] 9VAC25-610-10, definition of "agricultural use."

[64] Virginia Department of Environmental Quality, Agricultural Water Use Resource Center, retrieved August 23, 2026.

[65] 9VAC25-200-30(A)(2); Va. Code § 62.1-44.38(C).

[66] 9VAC25-200-40(A).

[67] Va. Code § 62.1-258.1.

[68] Va. Code § 62.1-266(H); 9VAC25-920. See also 9VAC25-910 (Eastern Shore surficial aquifer general permit).

[69] 9VAC25-200-20. Statutory Authority: §§ 62.1-44.15(10) and 62.1-44.38.

[70] 9VAC25-200-30(A)(1), (2).

[71] 9VAC25-200-30(B)(1)(a).

[72] 9VAC25-200-40(A), (B).

[73] Va. Code § 62.1-256(4).

[74] Virginia Department of Environmental Quality, Water Withdrawal Reporting page, retrieved August 23, 2026.

[75] Virginia Department of Environmental Quality, Water Withdrawal Reporting page.

[76] Virginia Department of Environmental Quality, Water Withdrawals dashboard, updated February 2026. Coordinate withholding pursuant to Va. Code § 2.2-3705.2.

[77] 9VAC25-200-10, definition of "user."

[78] Virginia Department of Environmental Quality, *Annual Water Resources Report*, December 2025 (reporting year 2024), § 4.3 "Data Centers," pp. 47–48.

[79] Virginia Department of Environmental Quality, *Annual Water Resources Report*, Table 21 (2024, million gallons per day, excluding power generation): Loudoun 17.19; Fairfax 70.47; Prince William 2.59; Fauquier 3.54; Culpeper 3.08.

[80] Virginia Department of Environmental Quality, *Annual Water Resources Report*, Appendix 4.

[81] DEQ groundwater withdrawal permits GWI000471 (Bowling Green, screen at 214 feet), GWI000607 (Hopyard Farm, screens at 170, 185 and 240 feet), GWI000495 (Presidential Lakes, 300 feet) and GWI000470 (Elsinore and Ruther Glen, 235 feet). Screen depths verified permit by permit.

[82] Joint Legislative Audit and Review Commission, *Data Centers in Virginia*, Report 598, December 9, 2024, Appendix B, pp. 101–102.

[83] Joint Legislative Audit and Review Commission, *Data Centers in Virginia*.

[84] DEQ, *Draft Permit Issuance Fact Sheet, Groundwater Withdrawal Permit GWI000502*, pages 3 through 5. The Birchwood Power Facility closed March 1, 2021; decommissioning and demolition were completed in May 2022.

[85] DEQ, *Draft Permit Issuance Fact Sheet, Groundwater Withdrawal Permit GWI000502*, pages 3 through 5, and DEQ public notice, Birchwood Tech Campus, comment period August 12 to September 11, 2026. Proposed limits 6,400,000 gallons per year and 640,000 gallons per month for potable, irrigation and washdown use. **Author's calculation:** 6,400,000 divided by 365 is 17,534 gallons per day. DEQ attributes an estimated ninety percent to human consumptive use, derived as 35 gallons per employee per day across 450 employees. Predecessor permit GW00187EU authorized 7,000,000 gallons per year and 2,000,000 gallons per month. Reported withdrawals across the 2016 to 2025 term peaked at 4,989,076 gallons in 2018 and at 1,188,411 gallons in July 2019, all under the coal plant; post-closure annual figures run between 26,831 and 37,958 gallons and monthly figures have been under 10,000 gallons since December 2022. That permit was transferred from Birchwood Power Partners, L.P. to Amazon Data Services, Inc. by minor modification completed January 24, 2024, at page 3. **Scoped negative finding:** no corresponding transfer instrument for VWP 17-0702 is present in the corpus described at note [88] as of August 25, 2026, so Birchwood Power Partners is treated as permittee of record for that permit throughout.

[86] DEQ, *Draft Permit Issuance Fact Sheet, Groundwater Withdrawal Permit GWI000502*, 44 pages, read in full, pages 4 and 5: "Surface water withdrawals from the Rappahannock River are permitted by VWP Permit No. 17-0702 for industrial use at the facility," and "The facility has a surface water withdrawal permit, VWP Permit No. 17-0702, which allows surface water withdrawal from the Rappahannock River for industrial cooling water. The permit would require a major modification to include potable water as part of the beneficial use." Permit status confirmed active in DEQ's CEDS-derived Virginia Water Protection Individual Permits GIS layer, queried August 25, 2026, project point 38.24279 N, 77.29355 W.

[87] King George County, *Zoning Narrative*, applicant Birchwood Power Partners, L.P., filed August 23, 2023, section IX: "All cooling water necessary for rendering service to the data center and all other accessory or authorized uses on the Project Parcels will be provided via the surface water intake (the 'Intake') permit and related facilities approved by DEQ pursuant to VWP 17-0702 ... The Intake was originally permitted to provide water to the Power Facility. Although the Power Facility has been decommissioned, as a state regulated pumping facility, the Intake constitutes a public water system/source under the Code." The narrative gives no volume figure for the intake.

[88] Scoped negative finding. No issuance date, expiration date, permittee of record or volume limit for VWP 17-0702 is present in the DEQ published-document library (identifiers swept 29,500 through 33,600 by filename, plus targeted probes), the DEQ site search index, the GWI000502 draft permit package read in full at 44 pages, DEQ's *Annual Water Resources Report* for 2020, the King George County rezoning, proffer and special exception filings, or the Internet Archive record of deq.virginia.gov, as of August 25, 2026. A figure of 6.6 million gallons per day through 2034 circulates via the *Free Lance-Star* of August 8, 2023, attributed to DEQ. *Press.* It is not cited as a DEQ figure in this volume. DEQ does not post issued VWP permits except during an active comment period, so closing this requires a records request to the Office of Water Withdrawal Permitting.

[89] Letter of Senator Richard Stuart to Director Michael Rolband, August 20, 2026, as quoted in Shannon Heckt, "After eastern groundwater report detailed aquifer concerns, Va. lawmakers consider policy shifts," *Virginia Mercury*, August 21, 2026. **Press**, cited for the quotation; the letter itself was not obtained.

[90] The press characterization of the Birchwood withdrawal as cooling water could not be re-identified. No account carrying that characterization is present in the media record maintained for this series through

August 20, 2026, and fredericksburg.com, the likely origin, blocks automated retrieval. The characterization is therefore described rather than quoted. **The underlying resolution does not depend on it:** DEQ's own draft fact sheet for GWI000502 attributes the withdrawal to potable and related non-cooling use, and the cooling water is drawn under the separate surface water permit VWP 17-0702. See notes [84] and [86].

[91] Fauquier County Water and Sanitation Authority, *Comprehensive Drought Management and Emergency Preparedness Plan*, adopted August 11, 2016, amended December 13, 2018, section 8.5.1, pages 33 to 35. Stage triggers as a percentage of permitted capacity: Normal below 75 percent, Watch 75 to 85, Warning 85 to 95, Emergency above 95. **Scoped negative finding:** no system-wide permitted or rated capacity figure is present in the Authority's fiscal 2025 annual comprehensive financial report, its fiscal 2026 or fiscal 2027 adopted budgets, its drought page, or the consumer confidence reports retrieved, as of August 25, 2026.

[92] *Gendreau v. McEvoy*, Roanoke Circuit Court. Petition filed October 9, 2025; ruling of Judge Leisa Ciaffone, November 5, 2025, holding that a data center's water usage is not a trade secret under the proprietary information exclusion of the Virginia Freedom of Information Act. First Virginia ruling to so hold.

[93] Court of Appeals of Virginia declined to stay the order January 28, 2026 and declined a renewed request. Unredacted records released February 23, 2026 in advance of a civil contempt hearing set for March 3, 2026; figures public by February 25, 2026.

[94] Heywood, C.E., and Pope, J.P., 2009, *Simulation of Groundwater Flow in the Coastal Plain Aquifer System of Virginia*, U.S. Geological Survey Scientific Investigations Report 2009-5039, prepared in cooperation with the Hampton Roads Planning District Commission, Table 1, "Summary of Potomac aquifer-performance test results."

[95] Heywood and Pope, 2009, SIR 2009-5039.

[96] Eggleston, Jack, and Pope, Jason, 2013, *Land subsidence and relative sea-level rise in the southern Chesapeake Bay region*, U.S. Geological Survey Circular 1392, doi:10.3133/cir1392, citing Konikow and Neuzil, 2007.

[97] Eggleston and Pope, 2013, Circular 1392, citing Pope, 2002.

[98] Trapp, Henry, Jr., and Horn, M.A., 1997, *Ground Water Atlas of the United States: Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virginia*, U.S. Geological Survey Hydrologic Atlas 730-L, Piedmont and Blue Ridge section.

[99] Trapp and Horn, 1997, *Ground Water Atlas of the United States*.

[100] Trapp and Horn, 1997, *Ground Water Atlas of the United States*.

[101] Trapp and Horn, 1997, *Ground Water Atlas of the United States*.

[102] McCoy and Harlow, 2015, SIR 2015-5113.

[103] McCoy and Harlow, 2015, SIR 2015-5113.

[104] SIR 2015-5113. Model recharge and base-flow separation on Goose Creek (1931–2012) and the Big Otter River (1938–2012).

[105] Nelms, D.L., Harlow, G., and Hayes, D., 1997, *Base-flow characteristics of streams in the Valley and Ridge, the Blue Ridge, and the Piedmont physiographic provinces of Virginia*, U.S. Geological Survey Water Supply Paper 2457, 48 p. plus plate, doi:10.3133/wsp2457. Recharge range and median as reported in the publication abstract and summary; the full report was not retrieved. See Section 17.3.

[106] 9VAC25-610-110(D)(3)(h) and (D)(3)(c), Evaluation criteria for permit applications, Groundwater Withdrawal Regulations, as in effect August 25, 2026, derived from VR680-13-07 § 3.3 effective September 22, 1993 and last amended effective September 25, 2024. Subdivision (h) confines the 80 percent test to "any confined aquifer that the withdrawal impacts." Subdivision (c) addresses unconfined aquifers

expressly, requiring that no pump be set "lower than the top of the uppermost confined aquifer that a well utilizes as a groundwater source or lower than the bottom of an unconfined aquifer that a well utilizes as a groundwater source." The whole of subsection D applies only within a declared groundwater management area, which Section 3 establishes. **Primary.**

[107] Michael S. Rolband, Director, Virginia Department of Environmental Quality, "Details of Recommendation #1," slide 17. The General Assembly should amend the Ground Water Management Act to codify existing regulatory language providing that DEQ may deny an application for a new, expanded or renewed withdrawal in a groundwater management area if "[t]he cumulative stabilized impact of the proposed withdrawal in combination with all existing lawful withdrawals will lower water levels in a confined aquifer below a point that represents 80% of the distance between the land surface and the top of the aquifer." Emphasis on "in a confined aquifer" added. Compare 9VAC25-610-110(D)(3)(h) at note [106], which carries the same limitation.

[108] Aquaveo, LLC, *2024-2025 Annual Simulation of Reported Use and Total Permitted Groundwater Levels: VAHydroGW-VCPM and VAHydroGW-ES*, presented to the Eastern Virginia Groundwater Management Advisory Committee, April 8, 2026. Posted with the committee's meeting materials on DEQ's Eastern Virginia Groundwater Management Advisory Committee page and retrieved August 25, 2026. **Primary, and the operative state of the model this volume's Section 7 describes.** Critical surface definition as quoted. Total permitted withdrawal allocated to the Coastal Plain model: 168.9 million gallons per day in 2015, 104.0 in 2024, 108.6 in 2025, of which the VACPGWI average withdrawal component rose from 61.8 to 67.6 between those last two years. Reported use by locality on a 2020 to 2024 average totals 64.36 million gallons per day, of which Isle of Wight is 16.22 at 25.21 percent and King William is 16.14 at 25.08 percent. Aggregate reported use against total permitted is 66.8 percent. The historic model runs from 1890 to January 2025 and the predictive model from January 2025 to December 2074; the Coastal Plain model carries 771,840 cells of one square mile each. The deck records a 2019 recalibration, which is the Aquaveo recalibration for DEQ described at note [131].

[109] Trapp, Henry, Jr., and Horn, Marilee A., 1997, *Ground Water Atlas of the United States: Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virginia*, HA 730-L, "Piedmont and Blue Ridge aquifers." Crystalline-rock and undifferentiated sedimentary-rock aquifers cover about 49,000 square miles, approximately 86 percent of the two provinces in the segment. On flow paths: "In crystalline-rock areas, the regolith and fractures in the bedrock serve as the principal places for the storage transmission of water, and ground-water movement is generally along short flow paths from interstream recharge areas to the nearest stream." Retrieved as running text August 25, 2026. **Primary.** The atlas is a seven-state segment report and its yield statistics are organized by aquifer type rather than by Virginia terrane; Section 17.3 states that limit.

[110] Trapp and Horn, 1997, HA 730-L, "Aquifers in Early Mesozoic Basins." The Culpeper Basin is the third largest of the early Mesozoic basins, "an elongate, fault-bounded trough that trends north-northeast from the southern border of Madison County, Va., about 90 miles to Frederick County, Md." On its structure: "the ground-water system in the early Mesozoic basins consists of a series of aquifers of tabular form that alternate with confining units that are several tens of feet thick," and "the hydraulic connection across the confining units between individual aquifers is poor." On sustained yield: many wells "yield large quantities of water during pumping tests that range from 24 to 48 hours but fail to maintain large yields over long periods of time," and "the yields of several wells that were tested at 75 gallons per minute soon after completion declined in a few years to about 15 gallons per minute." **Primary.** The atlas reports the yield-decline observation for the early Mesozoic basins as a class rather than for the Culpeper Basin specifically.

[111] HA 730-L, Valley and Ridge section.

[112] Hollyday, E.F., and Hileman, G.E., 1996, *Hydrogeologic terranes and potential yield of water to wells in the Valley and Ridge Physiographic Province in the eastern and southeastern United States*, U.S. Geological Survey Professional Paper 1422-C, doi:10.3133/pp1422C. Interquartile ranges for the 412 most productive wells.

[113] Nelms, D.L., and Moberg, R.M., 2010, *Hydrogeology and groundwater availability in Clarke County, Virginia*, U.S. Geological Survey Scientific Investigations Report 2010-5112, 71 p., doi:10.3133/sir20105112.

[114] Nelms and Moberg, 2010, SIR 2010-5112, Specific yield of 0.01 for the zone of water-level fluctuation, citing Harlow and others, 2005.

[115] Va. Code § 62.1-257(A)(2).

[116] HA 730-L, Valley and Ridge section.

[117] SIR 2009-5039.

[118] SIR 2009-5039.

[119] SIR 2009-5039.

[120] SIR 2009-5039, Model code, grid, discretization, calibration, and 2003 withdrawal totals.

[121] Pope, J.P., Gordon, A.D., and Frederiks, R.S., 2026, *Computation of Regional Groundwater Budgets for the Virginia Coastal Plain Aquifer System*: U.S. Geological Survey Open-File Report 2026-1002, 48 p., https://doi.org/10.3133/ofr20261002, published April 2026 by the USGS Virginia and West Virginia Water Science Center. The naming of the two operational models, the 2019 recalibration of VAHydroGW-VCP by Aquaveo for DEQ, and the fifty-year projection horizon are all stated in the report's discussion of the application of ZONEBUDGET software to those models. **Primary.** DEQ's own 2026 presentation materials render the models as VAHydroGW-VCPM and VAHydroGW-ES; the forms used in the text are the USGS report's.

[122] Virginia Department of Environmental Quality, *Senate Joint Resolution No. 25: Groundwater Supply East of Interstate 95, Report*, July 2026. Delivered to the Secretary of Natural and Historic Resources. Cover image: multi-well research station with real-time monitoring and telemetry, New Kent County, State Observation Wells 233A through 233F.

[123] Virginia Department of Environmental Quality, *Senate Joint Resolution No. 25*, Table 10, "Technical Evaluation Results for Hypothetical Withdrawals," and Figure 37. The hypothetical volume tested at each location was 3 million gallons per day. Two scenarios were run at Surprise Hill, one well and three wells at one-mile spacing, with the same result.

[124] Virginia Department of Environmental Quality, *Senate Joint Resolution No. 25*, § 2.5.3.

[125] Virginia Department of Environmental Quality, *Senate Joint Resolution No. 25*, The "AOI" is the area of impact. The 80 percent drawdown criterion is the technical permitting standard discussed in the eastern volume.

[126] Virginia Department of Environmental Quality, *Senate Joint Resolution No. 25*, referring to Figure 17.

[127] *Agenda, State Water Commission, August 20, 2026*, 10:00 a.m., Senate Room A, Room 305, General Assembly Building. Item 5, "Presentation on SJ 25 Groundwater Report," lists three presenters in order: Mike Rolband, Director, Department of Environmental Quality; Andrea Wortzel, Partner, Troutman Pepper Locke representing Mission H2O Virginia; and Jay Ford, Virginia Policy Manager, Chesapeake Bay Foundation. Senator Scott A. Surovell chaired; Delegate Paul E. Krizek is Vice-Chair. The membership list gives Delegate John C. McAuliff, which is the spelling adopted in this volume. Retrieved August 25, 2026. **Primary.**

[128] Andrea Wortzel, Partner, Troutman Pepper Locke, *Mission H2O: Assessment of SJ 25 Groundwater Report*, presented to the State Water Commission August 20, 2026, 29 slides. Posted with the meeting materials and retrieved August 25, 2026. **Primary, and adverse to this volume's reading.** Withdrawal reductions at slide 7 and slide 14, citing the SJ 25 Report at vii and at 52; saltwater intrusion at slide 12, citing the report at 9, 72, 75, 79 and 104; land subsidence at slide 13; the SWIFT timeline and capacity at slides 16 through 20; the projected water balance at slide 29. Recommendations on unpermitted withdrawals at slides 22 through 24, including "Reduce the exemption level (currently 300,000 gallons per month)."

[129] Virginia State Water Commission, August 20, 2026, video time 2:19:02–2:19:23. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation. Michael Rolband, Director, Department of Environmental Quality. Corrected caption track. Not confirmed by a second

speaker. The referent of "up there" is established from the SJ 25 report passage quoted at Section 7.4 rather than from the recording or the slide; see Section 7.4 and the slide cited there.

[130] Michael S. Rolband, Director, Virginia Department of Environmental Quality, "Details of Recommendation #2," slide 19: "The GA should amend Chapter 22 of Title 15.2 of the Code of Virginia to require local comprehensive plans in GWMAs to limit planned growth based on GW availability if no other water supply is feasible." Emphasis on "in GWMAs" added.

[131] Virginia State Water Commission, August 20, 2026, video time 2:19:23–2:19:41. Michael Rolband, Director, Department of Environmental Quality, continuing without interruption from the passage cited immediately above. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation.

[132] Michael S. Rolband, Director, Virginia Department of Environmental Quality, "Details of Recommendation #1 (continued)," slide 18, item d: "Prohibit DEQ from issuing permits for new significant withdrawals in portions of GWMAs located outside the extent of the applicable GW flow model.".

[133] Virginia Department of Environmental Quality, *Senate Joint Resolution No. 25: Groundwater Supply East of Interstate 95*, July 2026, § 1.4.4, "Groundwater Flow Models," at page 21, under the subheading "VCP Groundwater Flow Model." Emphasis added.

[134] Presentation slide 14, "Key Point #7," displayed during the Director's testimony to the Virginia State Water Commission, August 20, 2026, reproducing Figure 37 of the SJ 25 report with the caption "Maximum withdrawal (gallons per day) projected to meet criteria for a groundwater withdrawal permit. Groundwater budget regions for reference." The slide's two bullets read: "Maximum of 360,000 gallons per day in the eastern Northern Neck" and "30,000 gallons per day in some western regions near I-95."

[135] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 366, paragraph Q.

[136] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 366, paragraph Q, paragraph Q, second sentence.

[137] Virginia State Water Commission, August 20, 2026, video time 2:28:06–2:28:22. The same exchange cited in Section 2, where the speaker identification and the reasoning supporting it are set out. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation.

[138] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 366, paragraph O, quoted in full. Emphasis added.

[139] Virginia State Water Commission, August 20, 2026, video time 2:28:52–2:29:28. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation. Michael Rolband, Director, Department of Environmental Quality. Corrected caption track.

[140] Virginia State Water Commission, August 20, 2026, video time 2:33:24–2:33:39. Michael Rolband, Director, Department of Environmental Quality. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation.

[141] Fairfax County Department of Public Works and Environmental Services, Noman M. Cole, Jr. Water Recycling Facility, retrieved August 24, 2026.

[142] Virginia State Water Commission, August 20, 2026, video time 2:30:07–2:30:30. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation. Michael Rolband, Director, Department of Environmental Quality. Corrected caption track; Section 17.1 states the provenance limitation that applies to every quotation from this hearing.

[143] Virginia State Water Commission, August 20, 2026, video time 2:30:33–2:30:46. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation. Delegate John C. McAuliff, as the Commission's own membership roster gives the name. The caption track renders it "McAuliffe." The correct spelling appears in this volume's own note on House Bill 501, which he patroned. Corrected caption track.

[144] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 366, paragraph N.

[145] HB501 (McAuliff), 2026 Regular Session. "Left in Committee Rules," February 18, 2026. Legislative Information System.

[146] W. Weedon Cloe III, PWS, Manager, Office of Water Supply, Virginia Department of Environmental Quality, *DEQ Updates: Eastern Virginia Groundwater Management Advisory Committee Meeting*, June 17, 2026. Posted with the committee's meeting materials and retrieved August 25, 2026. **Primary.** Water supply planning: 9VAC25-780 amended, twenty-five regional planning areas, "FY26 Grant Cycle Completed (June), $233,720.36 distributed to 23 Regional Planning Areas that applied," regional plans due October 9, 2029. Water withdrawal reporting: HB496 and SB553 of the 2026 session require "[r]eporting of monthly volumes of potable/reclaimed water supplied to data centers and other categories of uses," effective January 1, 2027, which is the provision Section 10.3 sets out. Groundwater: the chloride-monitoring network expansion with DEQ-USGS drilling from June 24, the first two planned state observation wells bracketing the James River SWIFT site, five wells upgraded from periodic to real-time with three more planned, and the stated object of "a perimeter of nine real-time stations to monitor the Potomac Aquifer's response to SWIFT." The deck records the SJ 25 report as "Under Executive Review" as of June 17, 2026; it was published the following month. **The four presentations posted for this meeting are the DEQ updates cited here, a Managed Aquifer Recharge draft work plan, an HRSD SWIFT update, and "Why Now: SWIFT Water Allocation Planning." Only this one was read for this volume.**

[147] Virginia Department of Environmental Quality, *Eastern Virginia Groundwater Management Advisory*, meeting of December 16, 2024: "During the new business of the committee, a motion was made and supported by the members to extend the sunset date of the EVGMAC by five years … As a follow up to this motion, the committee members, by general consensus, supported the inclusion of specific topics for the group to consider, including the concept of groundwater trading, data center water use, and the consideration of agricultural concerns, during future meetings." The presentations recorded for the three subsequent meetings in that report are the HRSD SWIFT progress update, the USGS self-supplied domestic withdrawal study, and the Coastal Plain groundwater monitoring network assessment. **The absence is scoped to the presentations summarized in the 2025 annual report.** Meeting materials for fiscal 2026 are posted separately and were not read for this volume; the September 29, 2025, December 4, 2025, April 8, 2026 and June 17, 2026 meetings each have posted presentations.

[148] Virginia Department of Environmental Quality, *Eastern Virginia Groundwater Management Advisory*, Membership, listing the twenty-five members and their alternates for the fiscal year July 1, 2024 through June 30, 2025. Va. Code § 62.1-256.2(A) requires the committee to comprise "representatives of industrial and municipal water users; representatives of public and private water providers; developers and representatives from the economic development community; representatives of agricultural, conservation, and environmental organizations; state and federal agency officials; and university faculty and citizens with expertise in water resources-related issues," and defines its remit as groundwater "in the Eastern Virginia Groundwater Management Area." The observation that no locality west of Interstate 95 is represented is this volume's, on the membership list as published for that year.

[149] Virginia Department of Environmental Quality, Groundwater Characterization and Monitoring Program page, retrieved August 23, 2026.

[150] Virginia Department of Environmental Quality.

[151] SIR 2009-5039.

[152] Nelms, Harlow and Hayes, 1997, Water Supply Paper 2457, cited above. See Section 17.3 on the limits of what was retrieved.

[153] SIR 2015-5113.

[154] SIR 2015-5113.

[155] Circular 1392.

[156] SIR 2010-5112.

[157] SIR 2009-5039 (calibration statistics); SIR 2015-5113 (standard error and fracture heterogeneity limitation).

[158] U.S. Geological Survey Virginia and West Virginia Water Science Center, "Fauquier County Groundwater Resource Assessment and Monitoring Study," project page, retrieved August 24, 2026. Water use figure attributed there to Maupin and others, 2014.

[159] Agriculture Work Group, Loudoun County Preservation and Conservation Coalition, *Assessment of the Groundwater Supply in Loudoun County, Virginia*, Leesburg, Virginia, dated August 24, 2025, released September 2025, with a subsequent errata. Author identifications from the coalition's public correspondence, *Blue Ridge Leader*, May 14, 2026.

[160] Agriculture Work Group, Loudoun County Preservation and Conservation Coalition, Section 8, Summary and Conclusion.

[161] Agriculture Work Group, Loudoun County Preservation and Conservation Coalition, Section 4 and Section 10. The count of active wells excludes wells recorded as abandoned or destroyed.

[162] Agriculture Work Group, Loudoun County Preservation and Conservation Coalition, Sections 3.1 and 3.2. The three long-record wells are at Short Hill north of Hillsboro (1963 to present), east of Leesburg (1977 to present), and in the Bull Run watershed in Prince William County just south of the Loudoun line (1968 to present).

[163] Agriculture Work Group, Loudoun County Preservation and Conservation Coalition, Section 3.1.

[164] Agriculture Work Group, Loudoun County Preservation and Conservation Coalition, summary of state-level oversight.

[165] Loudoun County Preservation and Conservation Coalition, Loudoun County Groundwater Study project page, describing an action plan in process, retrieved August 24, 2026.

[166] Loudoun County Sanitation Authority (Loudoun Water), *Annual Comprehensive Financial Report*, fiscal year 2025, Table 17; Loudoun Water, Potomac Water Supply Program page, retrieved August 24, 2026.

[167] Northern Virginia Regional Commission, *Northern Virginia Water Supply Plan Interim Update 2018*.

[168] Interstate Commission on the Potomac River Basin, *2025 Washington Metropolitan Area Water Supply Study*, Publication ICP-596, December 2025.

[169] Loudoun Water, Potomac Water Supply Program page, retrieved August 24, 2026.

[170] Loudoun Water, Facilities page and *Annual Comprehensive Financial Report* fiscal year 2025 (Trap Rock in-service date); Loudoun Water, Potomac Water Supply Program page and Data Centers and Impacts of Water Supply page (the 90 million gallon per day figure). Both retrieved August 24, 2026.

[171] Loudoun Water, Reclaimed Water Program page, retrieved August 24, 2026. The 2024 figure of 736 million gallons is from Loudoun Water published figures.

[172] Loudoun Water, Facilities page, retrieved August 24, 2026.

[173] Loudoun Water, Facilities page, retrieved August 24, 2026.

[174] Loudoun Water, Rates, Fees, Charges and Penalties, effective January 1, 2026, retrieved August 23, 2026.

[175] Loudoun Water, Reclaimed Water Program page, retrieved August 24, 2026.

[176] Joint Legislative Audit and Review Commission, *Data Centers in Virginia*, Report 598, December 9, 2024, p. 65.

[177] Loudoun Water, Data Centers and Impacts of Water Supply page, calendar 2025 actuals for the Central Service Area, retrieved August 24, 2026. Figures are published only as infographic images and were read from the image files.

[178] Fairfax Water plant capacities from Fairfax Water published materials. Calendar 2024 withdrawals from Virginia Department of Environmental Quality, *Annual Water Resources Report*, December 2025: Table 5, p. 32; Appendix 1, Table 20, p. 52; Appendix 2, Table 21, p. 53. Calendar 2023 withdrawals from the same series, October 2024, RD512: Table 5, p. 32; Appendix 1, Table 20, p. 50; Appendix 2, Table 21, p. 51. Table 21 totals include groundwater; the surface water components quoted here are 86.86 and 70.08 for Fairfax and 69.74 and 2.15 for Prince William, against locality totals of 87.09 and 70.47, and 70.13 and 2.59. The combined 164.0 is the author's calculation from two separately reported plant entries and is not printed by DEQ. Both editions were read from the source PDFs on August 26, 2026.

[179] Fairfax Water, *2026 Annual Budget*, adopted December 11, 2025.

[180] Va. Code § 62.1-44.15:22(B).

[181] 9VAC25-210-310(A)(1)(b).

[182] 9VAC25-210-310(B).

[183] 9VAC25-210-310(B) provides the residual authority. On the litigation history and the decree, see the *Virginia v. Maryland* citations that follow; the opinion was retrieved and read in full at 540 U.S. 56 (2003).

[184] *Virginia v. Maryland*, 540 U.S. 56, 63–64 (2003). The 1933 Maryland permitting system, Fairfax County's 1956 application to withdraw up to 15 million gallons per day and its 1957 grant, the at least 29 permits issued to Virginia entities between 1957 and 1996, the 1996 intake application, the 1997 denial, and the flow-restrictor condition imposed by 2000 Md. Laws ch. 557, § 1(b)(2)(ii).

[185] *Virginia v. Maryland*, 540 U.S. 56, 79–80 (2003) (Decree, paragraphs 2 and 3). The decree contains five numbered paragraphs; paragraph 1 holds that Article Seventh of the Compact of 1785 applies to the entire length of the Potomac River including its nontidal reach.

[186] *Virginia v. Maryland*, 540 U.S. 56, 75 (2003).

[187] *Virginia v. Maryland*, 540 U.S. 56, 77 n.10 (2003) (opinion of the Court, Rehnquist, C.J.).

[188] A Fairfax County capital improvement program water chapter of approximately 2000, encountered in Maryland State Archives holdings searched for Fairfax Water's Potomac withdrawal permits. **The document could not be identified.** No program title, fiscal year, publication date, chapter designation or page number was recorded, and it was not relocated in the Maryland State Archives finding aids or in Fairfax County's published capital improvement program series in preparing this volume. It is cited as an unidentified document and carries no weight beyond the bare fact that a figure of that kind was once published. It is not the January 24, 2001 permit whose conditions the Court voided, and not the 15 million gallon per day permit of 1957. This document is not the January 24, 2001 permit whose conditions the Court voided, and is not the 15 million gallon per day permit of 1957.

[189] Virginia Department of Environmental Quality, *Annual Water Resources Report*, October 2024, RD512.

[190] Virginia Department of Environmental Quality, *Annual Water Resources Report*, December 2025, reporting calendar year 2024. The October 2024 edition, RD512, reports calendar year 2023 and is cited at the preceding note for the earlier figures; it does not contain the 2024-year figures and must not be cited for them.

[191] Fairfax Water, *2026 Annual Budget*, adopted December 11, 2025, p. 16, Sources of Supply.

[192] The "about 65 million gallons per day" figure comes from the unidentified Fairfax County capital improvement program water chapter described at the preceding note, whose title, fiscal year, publication date and page could not be established. **Because that figure cannot be pinned to a citable document, this volume does not assert that the Occoquan was drawn above its safe yield.** The finding supported here is the narrower one: no Occoquan safe yield published by Fairfax Water, the Occoquan Watershed Monitoring Laboratory or the Interstate Commission on the Potomac River Basin was located in the corpora searched for this volume.

[193] Fairfax Water capital improvement program, Project 2789, Griffith PFAS PAC System.

[194] Fairfax Water, *Annual Comprehensive Financial Report*; ICPRB Publication ICP-596, December 2025.

[195] Fairfax Water, *Schedule of Rates*, Schedule No. 5.

[196] Fairfax Water, *2026 Annual Budget*, adopted December 11, 2025.

[197] Fairfax Water, *2026 Annual Budget*, Exhibit 1, p. 25. Per-unit figures are the author's calculation from budgeted revenue divided by budgeted volume and are not quoted rates.

[198] Loudoun County Sanitation Authority, *Annual Comprehensive Financial Report*, fiscal year 2025.

[199] Fairfax Water, Minutes of the December 11, 2025 Board Meeting.

[200] Fairfax Water, Minutes of the March 5, 2026 Work Session.

[201] Fairfax Water, Minutes of the June 18, 2026 Board Meeting.

[202] Upper Occoquan Service Authority, uosa.org, retrieved August 24, 2026.

[203] Prince William Water, *Annual Comprehensive Financial Report*, fiscal year 2025, Note 12 and Table 14.

[204] Prince William Water, *Annual Comprehensive Financial Report*; Prince William Water, *Capital Improvement Program FY2027–2031*, approved May 14, 2026.

[205] Uriah Kiser, Potomac Local News, October 23, 2024. **Press.**

[206] Don Pannell, P.E., Deputy General Manager and Chief Operating Officer, *Water Supply Briefing: Prince William County Sustainability Commission*, December 16, 2024, slide "Key Takeaways – Digital Gateway Water Reuse." "BC" denotes Brown and Caldwell.

[207] Prince William Water, public frequently asked questions, retrieved August 23, 2026.

[208] Prince William Water, *Capital Improvement Program FY2027–2031*, approved May 14, 2026.

[209] Prince William Water, *Capital Improvement Program FY2027–2031*, Project WRF-138.

[210] Prince William County Data Center Opportunity Zone Overlay District frequently asked questions, November 2021; Prince William County Sustainability Commission briefing, 2023; Prince William Water frequently asked questions, calendar 2025.

[211] Prince William County Data Center Opportunity Zone Overlay District frequently asked questions, Question 26, updated April 19, 2022.

[212] Prince William Water, *Capital Improvement Program FY2027–2031*, Project REG-5.

[213] Prince William Water rate schedule and availability fee schedule, fiscal year 2025.

[214] Prince William Water, *Annual Comprehensive Financial Report*, fiscal year 2025, Table 5.

[215] Fauquier County Water and Sanitation Authority, drought page, frequently asked questions, retrieved August 25, 2026: the Authority operates "about fifty" wells. The same page states that a typical well "is permitted at a specific flow rate ... with an allowed maximum runtime of 10-14 hours per day," and that the Authority does not regulate private wells.

[216] Fauquier County Water and Sanitation Authority, *Annual Comprehensive Financial Report*, fiscal year 2025.

[217] Fauquier County Water and Sanitation Authority, *Annual Comprehensive Financial Report*, Table 12 against Table 6. The report carries the note that tables have "been restated in prior years per new information provided to management." Total water consumption for fiscal 2024 reads 444,834 thousand gallons in the fiscal 2024 report and 460,955 in the fiscal 2025 report.

[218] Laczniak, R.J., and Zenone, C., 1985, *Ground-water resources of the Culpeper basin, Virginia and Maryland*: U.S. Geological Survey Miscellaneous Investigations Series Map I-1313, Chapter F, Plate 1, https://doi.org/10.3133/i1313F. **Citation note:** the USGS Fauquier groundwater project page dates this publication to 1984 and the Publications Warehouse to 1985; cite 1985. The substance is carried entirely on

the plates; the report PDF at the Publications Warehouse is a cover sheet. The report uses lithologic codes rather than modern formation names, so any correlation to the Manassas Sandstone, Bull Run, Balls Bluff, Catharpin Creek or Waterfall formations is an interpretive step the source does not take, and no separate median yield for diabase appears in its Table 1.

[219] Author's computation from the USGS National Water Information System, site service, Fauquier County groundwater sites, queried August 24, 2026. 379 sites, 272 carrying a depth, median 262 feet, range 25 to 1,200. Aquifer coding: 43 Catoctin Formation at median 350 feet, 27 Marshall Formation at median 305; 70 of 145 coded depth-bearing sites are Blue Ridge crystalline against 16 for the Newark Group, Balls Bluff, Bull Run and diabase combined, with one site coded to diabase.

[220] Emery and Garrett Groundwater Investigations, *Final Hydrogeologic Report, Stafford Farm*, April 2016, Tables I and II and section VII-D. Specific capacities 0.07 to 0.12 gallons per minute per foot. Well STA-3: 62 gallons per minute on airlift, 43 sustained on a 74-hour constant-rate test, recommended not to exceed 43 gallons per minute at a twelve-hour daily duty cycle. **Author's calculation:** 43 gallons per minute for twelve hours is approximately 31,000 gallons per day, against approximately 61,900 for the same rate over twenty-four hours. Well STA-4: 20 gallons per minute on airlift, reduced to 15 within the first hour of the long test. The same report describes the Catoctin greenstone as "poorly fractured (has a massive appearance)" and offers a contaminated well as usable for "irrigation, fire flow, cooling towers, washing of trucks."

[221] McCoy, K.J., and Ladd, D.E., 2019, *Estimated groundwater recharge in the Blue Ridge, Piedmont and Mesozoic basin physiographic provinces*: U.S. Geological Survey Scientific Investigations Report 2019-5056, Table 5. Mean annual recharge 8.1 inches Blue Ridge, 8.0 western Piedmont, 5.3 Mesozoic basins; 2001 drought year 3.2, 3.1 and 2.2 respectively.

[222] Kearns, J.M., and McCoy, K.J., 2022, U.S. Geological Survey Scientific Investigations Report 2022-5014, page 5, page 7 and Table 1 at page 8. Fauquier County groundwater withdrawal 4.32 million gallons per day in 2015; public supply 1.76 serving 26,229; private domestic self-supply 2.51 serving 31,328, described as "the largest categorical use of groundwater in the county."

[223] *Fauquier County Regional Water Supply Plan*, September 29, 2011, Table 1.25, page 21. 14,425 address points outside the Service Districts, approximately 39,669 people at 2.75 persons per household, a multiplier taken from the 2000 Census. The county adopted the address-point method after cataloging 4,080 historical Virginia Department of Health well logs and finding them "incomplete in scope and reliability." The 2016 and 2018 drought plan restates the population as 39,670 and misattributes the source to a "2009 Water Supply Plan."

[224] Fauquier County Water and Sanitation Authority, *Comprehensive Drought Management and Emergency Preparedness Plan*, section 7.2.7.

[225] Fauquier County, drought information page, updated July 29, 2026. **Scoped negative finding:** no Virginia Department of Health or Rappahannock Rapidan Health District document announcing this waiver was located; the county page is its only publication found as of August 25, 2026.

[226] Author's computation from the USGS National Water Information System series catalog, queried August 24, 2026. Of 379 Fauquier groundwater sites, 203 carry a water level of any kind and five were ever continuous recorders. One, site 384957077481701, well 48U 26 or SOW 215, finished at 349.5 feet in the Catoctin Formation, has reported since October 1, 2006. Four went dark between December 2020 and October 2021, including both Jurassic-system recorders, 48S 38 and 49U 81. **Author's calculation:** ordinary least squares on annual medians of parameter 72019 across eighteen complete years returns a decline of 0.147 feet per year, approximately 2.6 feet in total. **Citation trap:** USGS Scientific Investigations Report 2022-5014, figure 4, compares wells 48U 26 and 49V 1; well 49V 1 is in Prince William County and the report describes the comparison as regional.

[227] Fauquier County Water and Sanitation Authority, *Mandatory Outdoor Water Usage Restrictions Issued for FCWSA Water Systems*, dateline Warrenton, June 5, 2026, two pages. **Scoped negative findings:** the instrument carries no resolution number, adopting body, vote, effective date, sunset, exemption clause or penalty; no drought, water-restriction or conservation item appears on any of the seven Authority board

agendas posted for calendar 2026, being January 27, February 24, March 31, April 28, May 26, June 30 and August 25; and the Authority publishes agendas only, with no minutes and no resolution texts. **The June 12, 2026 item was not captured by title, file name or URL, and no Authority document of that date is identified here.** The claim in the text is therefore a statement about what the search reached rather than about what the Authority has published, and closing it requires a capture of that item. For the contrast drawn in the text, Fauquier County, "Drought Conditions 2026," county administration page, "Drought Details (August 6, 2026 update)," retrieved August 25, 2026, which also carries the county's notice that "On June 6, 2026 Fauquier County Water and Sanitation Authority issued MANDITORY Water Restrictions for all FCWSA customers," spelling as in the original. **The county gives June 6 and the Authority instrument is datelined June 5.** Both are reported and neither is adopted. Cite the 2026 notice by full file name; a near-identically worded Authority notice exists from summer 2024.

[228] See note [91].

[229] Fauquier County Water and Sanitation Authority, PFAS page, last modified August 20, 2025. Six of sixteen systems exceed a federal maximum contaminant level: Marshall, Waterloo Estates, Botha, Bealeton, Bethel Academy and New Baltimore. **Caveat:** the page predates and does not address the Environmental Protection Agency's subsequently announced intent to extend the PFOA and PFOS compliance date and reconsider the other four maximum contaminant levels; the Authority's fiscal 2027 budget of May 2026 still assumes the five-year compliance frame running from the rule of April 10, 2024.

[230] Fauquier County Water and Sanitation Authority, *FY2027 Adopted Budget*, adopted May 26, 2026, pages 1, 3 and 16, and capital improvement program tables at pages 62 through 65 with narrative at page 67.

[231] Fauquier County Water and Sanitation Authority, *FY2027 Adopted Budget*, capital improvement program: "New Baltimore – Decommision Wells after Prince William Interconnection," $1,000,000 across fiscal 2031 and 2032 [spelling as in the original]. New Baltimore interconnection, "PFAS Compliance - New Baltimore (1.564 MGD Capacity)," $10,000,000 in fiscal 2027 and $20,000,000 in each of fiscal 2028 and 2029, $50,000,000 in all, against $18,240,000 over fiscal 2026 through 2030 in the *FY2026 Budget Book*; project summary, item 1: "Substantial infrastructure must be designed and constructed to connect the New Baltimore Water System to Prince William Water's system"; future 0.5 million gallon per day capacity purchase $6,750,000 in each of fiscal 2028 and 2035; New Baltimore to Vint Hill interconnection $250,000 in fiscal 2027.

[232] Prince William Water, Board Minutes, February 12, 2026, item 4(e), pages 3 to 4. **Scoped negative finding:** no executed water purchase, capacity or wholesale service agreement between the Authority and Prince William Water is present in Prince William Water's published agenda and minutes corpus, comprising 31 agendas from April 2024 to July 2026 and 27 sets of minutes from March 2024 to June 2026, nor in its adopted capital improvement programs for fiscal 2025-29, 2026-30 or 2027-31, nor do the phrases "Prince William Water," "water purchase agreement" or "interconnection agreement" appear in any Authority board agenda for 2024, 2025 or 2026, as of August 25, 2026.

[233] Prince William Water, *Annual Comprehensive Financial Report*, fiscal year 2025, Note 12, page 80: in December 2008 the Authority sold 1.4 million gallons per day of wholesale water capacity to the City of Manassas Park for $9,870,000, at a rate based on "the wholesale rate charged by Fairfax Water to the Authority, plus other charges and costs." Cited as the likely template rather than as the terms of any Fauquier agreement.

[234] State Corporation Commission, Case No. PUR-2025-00183, *Order Granting Approval*, March 19, 2026, page 3, and *Report of Action*, May 18, 2026. Purchase agreement dated June 26, 2025; consideration $1,500,000 cash; system serving 384 connections; ordering paragraph 2 cancels Buckland Water and Sanitation Assets Corporation's certificate of public convenience and necessity No. W-332. Agreements executed April 20, 2026 and recorded in Fauquier County Circuit Court April 29, 2026. The Authority's own statement before the transaction: "FCWSA has never actually owned the drinking water system."

[235] Fauquier County Water and Sanitation Authority, *Annual Comprehensive Financial Report*, fiscal year 2025, Table 13, page 97. **Author's calculation:** 1,978 thousand gallons over a year is approximately

5,420 gallons per day. **Data integrity flag:** the identical value of 1,978 appears in the water block at the same rank under the name "Peter Pan Llc," whose principal business the fiscal 2024 report gives as Buckland. Both percentages compute correctly against their respective totals, so this is what the document prints. The two rows are distinct accounts and are not merged here. The sewer attribution is what the record supports and no water consumption figure is asserted from that table.

[236] Fauquier County Zoning Ordinance, Article 4, Part 6, planned commercial and industrial development overlay, added by TEXT-24-021435 (2024), § 4-603 and § 4-605(c); Article 3, note 25. **Scoped negative finding:** "recycled water" is not defined in Article 15 (Definitions) and Article 9 (Performance Standards) contains no data center or cooling water standard, as of August 25, 2026. Fauquier County Board of Supervisors, *Data Center Policy*, December 14, 2023, section IV.B, which describes itself as "a guide." Fauquier County Planning Commission agenda, August 20, 2026, item 3.B, resolution to initiate a zoning ordinance text amendment to Articles 3, 4, 6 and 15 "Related to Data Centers and Other Relevant Definitions"; initiation only, no draft text published.

[237] Remington Digital Campus applications COMA-25-025997, REZN-25-025998, SPEX-25-025999 and WAIV-25-026023, applicant Lucky Hill LLC, approximately 200 acres, the special exception seeking "an Aboveground Water Storage Facility and Water Treatment System" and two substations. The applicant of record is Lucky Hill LLC; the developer trades as Gigaland, which is why the permit file and the press coverage carry different names. Planning Commission recommended denial four to one on July 16, 2026, reported in Piedmont Environmental Council, Evelyn Eichorn, "Gigaland: New Packaging, Same Harmful Impacts," posted July 10 and updated July 20, 2026. **The withdrawal is press, and it is now identified.** "Gigaland again withdraws application for Remington data center," *FauquierNow*, reporting that co-founder Art Lickunas wrote to Adam Shellenberger, the county's assistant director of community development, on August 17, 2026, asking that all four items be removed from the September 10, 2026 Board of Supervisors agenda. The first withdrawal was August 25, 2025, following a Planning Commission recommendation of denial, which is what makes this the second inside twelve months. The county's permitting portal is not machine-queryable and the withdrawal letter itself was not obtained.

[238] Emery and Garrett Groundwater Investigations and GZA, *Review of Groundwater Protection Initiatives*, presentation to the Fauquier County Board of Supervisors work session, November 14, 2024, 67 slides: the county and the Authority "have invested in excess of $100,000,000 ... in water supply infrastructure ... Yet there had been little to no money spent on protecting those water supply Production Wells." Bealeton wellhead protection area modeled at 2.2 square miles under 2022 to 2024 pumping and 3.3 square miles under simulated drought. Recommendations include developing a countywide drought water supply management plan on a well-by-well basis and generating water level trigger levels for each production well.

[239] Town of Warrenton staff analysis, SUP-22-3, quoting Zoning Ordinance Article 9-26.B as then in force: "The Town of Warrenton Zoning Ordinance Article 9-26.B states data centers shall utilize recycled water for air chillers, in conjunction with using recycled water, for cooling purposes. Potable water is not permitted to be used for cooling."

[240] Town of Warrenton Town Council, approval of SUP-22-3, January 10, 2023, four votes to three, following a Planning Commission public hearing of November 15, 2022. Facility 220,200 square feet on 41.79 acres.

[241] Town of Warrenton Town Council, approval of SUP-22-3, January 10, 2023, Condition 13.

[242] Town of Warrenton staff analysis, SUP-22-3: 190.5 gallons per day domestic and 190.1 gallons per day humidification, total 380.6; initial charging of the air-cooling system 19,000 gallons on a one-time basis, "since the system is a closed system."

[243] Press reporting, February 2023, recording the applicant's representative first stating that the facility "is air-chilled. It doesn't use water," then 1,500 gallons a day, then on September 9, 2022 revising to 138,912 gallons a year. *Press.* **Author's calculation:** 138,912 divided by 365 is 380.6, matching the staff analysis exactly. The staff analysis is the citation for the figure; the press is cited only for the sequence.

[244] Town of Warrenton, Ordinance ZOTA-25-1, *An Ordinance to Approve ZOTA-25-1, A Zoning Ordinance Text Amendment to Articles 3, 9 and 12 to Remove Data Centers as a Permissible Use Within the Industrial Zoning District*, adopted July 8, 2025 by a vote of six to nothing, one member absent. Strikes Data Center from § 3-4.12.3, strikes § 9-26 in its entirety including 9-26.1.B, and strikes the Article 12 definition. Recital: Council "now finds that a Data Center is a Use that does not further the health, safety and welfare of the public." Procedural chain: Council resolution of initiation March 22, 2025; Planning Commission work session April 22, 2025; Planning Commission public hearing and recommendation four to one, May 20, 2025; Council work session June 10, 2025; adoption July 8, 2025. Adoption and vote corroborated in *fauquiernow.com*, *rappnews.com* and *princewilliamtimes.com*. *Press, for the vote count only.*

[245] Town of Warrenton Zoning Ordinance, Articles 3 and 9 as currently posted, both files generated July 29, 2026: zero occurrences of "Data Center" in either, and § 9-26 reused as "Lodging Uses in the Central Business District." *Warrenton Zoning Ordinance Module 1 Public Draft*, May 2026, page 3-35, note 199: the draft "does not carry forward existing data center standards from Section 9-26 because data centers are no longer a permitted use in any district."

[246] Consent Order, *Cross v. Town of Warrenton*, CL23000128-00, Fauquier County Circuit Court, entered January 14, 2025, as quoted in the Town Attorney's letter to the Board of Zoning Appeals of December 15, 2025: "Amazon shall not seek, nor shall the Town approve, further permits or approvals related to the construction of a data center on the Property ... until a Final Order has been entered."

[247] The Town Attorney's position before the Fauquier County Circuit Court is on a court record and should be cited to that record. It is carried here on press reporting whose outlet, reporter and publication date were not recorded, and no transcript, order or filing was obtained. Press reporting of the position in *Cross v. Town of Warrenton*, that the challenge to the 2021 text amendment is legally cognizable and that the town no longer shares the applicant's alignment in the litigation. *Press.* Related procedural record: the Zoning Administrator denied Amazon's determination of vested rights under § 15.2-2307 on October 24, 2025; the appeal, BZA-25-3, was deferred three to nothing on February 3, 2026 pending the case; trial ran seven days from March 9, 2026 with final argument June 15, 2026. **Scoped negative finding:** no ruling is present in the press corpus searched as of August 25, 2026, and the Virginia circuit court civil docket search was not reachable.

[248] Town of Warrenton, public works and water supply pages, retrieved August 25, 2026: treatment plant rated 3.2 million gallons per day following the 2011 upgrade; "Further capacity increases are limited by the 2.3 MGD Safe Yield of the reservoirs"; Warrenton Reservoir approximately 124 million gallons of storage against a stated safe yield of 1.14 million gallons per day; Airlie Reservoir approximately 260 million gallons.

[249] Town of Warrenton, Water Conservation Ordinance No. 1999-08, reservoir-elevation based, Condition 1 at 150 days of storage through Condition 4. **Citation note:** the town's comprehensive plan gives two different adoption dates for this ordinance, August 10, 1999 at section 4 and January 20, 1999 at section 8.5.3, and the full text is not in the appendices of the retrieved drought plan although the plan states that it is appended. **Scoped negative findings:** no 2026 drought declaration or restriction by the Town of Warrenton is present in its alert center, news releases, public works pages, or the Council packets for May 12, June 9, July 14, July 16 or August 11, 2026, as of August 25, 2026; and current reservoir elevations are not published, so the town cannot be evaluated against its own conservation ladder from outside. **Citation trap:** a news account of voluntary conservation in Warrenton is dated July 11, 2024 and is surfaced by search engines as current.

[250] The governance, fiscal and land-use record for Stafford, Spotsylvania, Caroline, King George and the City of Fredericksburg is set out in the companion volume in this series covering the Fredericksburg Ring. Cross-reference only; no account is duplicated here.

[251] Author's computation, August 24 to 25, 2026. Coastal Plain contact traces extracted from the USGS State Geologic Map Compilation Virginia extract of Virginia Division of Mineral Resources (1993), *Geologic Map of Virginia*, 1:500,000, EPSG:4326, as the western updip boundary of the dissolved Coastal Plain map units. Interstate 95 centerline from OpenStreetMap via the Overpass API. Thirteen intersections are

computed between latitude 38.1055 and 38.5202, seventeen if Quaternary cover is excluded. Four of them bound excursions of only 314 to 539 meters, within about twice the roughly 250 meter positional precision of a 1:500,000 source and therefore not separable from map error; two further pairs sit close enough together that a small shift in the traced contact would merge them. Discarding those leaves six crossings that survive any reasonable allowance for source precision, which is why the volume reports at least six and does not publish thirteen as a count. Section 17 states the limitation.

[252] Author's computation from the same source. The Centreport Parkway industrial park polygon is 71 percent Potomac Formation (map unit Kp) and 29 percent quartz diorite gneiss (dgn); the interchange coordinate itself falls on gneiss, 219 meters from the mapped contact.

[253] Michael S. Rolband, Director, Virginia Department of Environmental Quality, "Key Point #7," slide 14, with the groundwater budget region map reproducing SJ 25 Report Figure 37. Regional maximum passing withdrawals as mapped: Northern Neck 180,000 and 360,000; Eastern Shore 180,000; Middle Peninsula 180,000; York-James 120,000; Southeast Virginia 120,000; Northwest Coastal Plain 60,000; Middle James and Chowan each less than 30,000. **The slide's own summary bullet gives 30,000 gallons per day for "some western regions near I-95," which is the Middle James rather than the Northwest Coastal Plain centroid this volume reports at 60,000.** Both figures are the agency's and both are reported here.

[254] Virginia Department of Environmental Quality, *Senate Joint Resolution No. 25: Groundwater Supply East of Interstate 95*, July 2026, maximum-passing withdrawal at the Northwest Coastal Plain centroid, Caroline County. Treated at length in the companion volume on SJ 25; the western gradient and the Caroline figure are what this volume takes.

[255] Virginia Department of Environmental Quality, *Senate Joint Resolution No. 25*, DEQ's stated benchmark for a typical hyperscale facility, approximately 300,000 gallons per day for 100 megawatts of information technology capacity across about 3.2 million square feet.

[256] Interstate Commission on the Potomac River Basin, *Data Centers and Water Use in the Potomac River Basin*, March 2026: the consumptive use factor "for data centers in the basin is 800 gallons/day/MW with an assumed consumptive-use factor of 75%." Section 9.2 sets DEQ's 3,000 gallons per day per megawatt against this figure and states that the divergence is unresolved. **The exceedance computed in this section is the author's, on the centroid figure at note [^254] and each of the two published benchmarks in turn.** Neither benchmark is adopted.

[257] "Virginia county looks to Rappahannock River as groundwater runs dry," *Bay Journal*, January 29, 2025. The article reports the thirty-five mile conveyance, the discharge to Polecat Creek and thence to the Mattaponi, and the origin of the industrial cooling allocation: "The allocation for data centers was originally for King George County when it agreed to be a water supply partner in 2021. But the counties decided to forgo the partnership when both parties learned about the lengthy studies required by DEQ for the water to be moved from Caroline to King George." **Press**, read in full. The basin crossing is independently evidenced by the 2025 Senate committee amendment to Senate Bill 923, which would have required DEQ to reject a surface water withdrawal permit "if more than six million gallons of water per day of the withdrawal will be returned to a different major river basin."

[258] *VWP Individual Permit No. 20-0514*, Caroline County Department of Public Utilities, facility "Caroline County Rappahannock River Water Supply," signed by the Director of the Water Resources Division on November 26, 2025, expiring November 25, 2040. Cover page. Retrieved in full, 1,077 pages, from DEQ published document 32549 on August 25, 2026. The document comprises the signed cover page, Part I Special Conditions, Part II General Conditions, the Permit Decision Rationale of November 26, 2025, and the supporting application record.

[259] *VWP Individual Permit No. 20-0514*, Cover page states 1,832 million gallons per year; Special Condition I.D.2.e and the Permit Decision Rationale at page 19 both state 1,862. Which controls is not established. Both figures are reported and neither is adopted.

[260] *VWP Individual Permit No. 20-0514*, Part I.A and the supporting record: three 42-inch wedge-wire t-screens on a 30-inch conveyance pipe; the Marine Resources Commission authorization request and the

Virginia Institute of Marine Science hydrodynamic modeling were both run at 13.9 million gallons per day. Part I.D.2.a caps withdrawal at 9.0. Actual withdrawal is zero; Part I.D.4 requires a Drought Management Plan within 180 days before commencement of withdrawal.

[261] *VWP Individual Permit No. 20-0514*, Cover page: "The permitted withdrawal will be used to provide a municipal public water supply. Other uses are not authorized by this permit." Permit Decision Rationale, page 9: "Subsequent to the first public hearing and comment period, the Applicant removed industrial cooling water demands from the requested withdrawal limits in additional information provided on December 20, 2024. Accordingly, industrial cooling uses are not authorized under this permit.".

[262] *VWP Individual Permit No. 20-0514*, Permit Decision Rationale, Table 5, "Applicant Requested Water Withdrawal Volumes," page 12. Reproduced identically at Attachment B, "Changes to the 1st Draft VWP Permit No. 20-0514," in DEQ, *Summary of Public Comments and DEQ Responses*, October 22, 2025, page 1. Maximum day 13.90 falling to 9.00 million gallons per day; maximum annual 2,884 falling to 1,862 million gallons.

[263] DEQ, *Summary of Public Comments and DEQ Responses*, October 22, 2025, page 13: "The combined residential demand for the proposed service area is estimated to be an average of 2.63 Mgal/d within the 15-year permit term." Revised in the final Permit Decision Rationale, page 11, to 2.47 million gallons per day residential plus 1.34 commercial. **This figure is residential demand and not cooling demand.**

[264] "Summary of Industrial Cooling Water Demands," a table located by its caption inside the applicant's additional-information response bound into the VWP 20-0514 permit package. Maximum day cooling demand rising from 0.4 million gallons per day in 2025 to 4.2 in 2038, allocated as Project Tract 0.2 to 0.6, Project Clean Arc 0.2 to 1.4, and Project Tricycle zero to 2.2.

[265] *VWP Individual Permit No. 20-0514*, Part I.D.2.b and c and Part I.D.5.a through d. Curtailment to 7.0 million gallons per day on a declared drought warning and 6.0 on a drought emergency, triggered by a declaration in the Northern Coastal Plain Drought Evaluation Region or by Caroline County under its own Drought Management Ordinance, whichever is more restrictive, with weekly reports to DEQ each Monday during any declared drought.

[266] *VWP Individual Permit No. 20-0514*, Part II.B.1: "This permit is valid for fifteen (15) years from the date of issuance." Part II.D bars modification to "extend the term of a VWP permit beyond 15 years from the date of original issuance." A new application is due not less than 270 days before expiry.

[267] Loudoun Water, Rates, Fees, Charges and Penalties, effective January 1, 2026, Table 3, retrieved August 23, 2026.

[268] Loudoun Water, Rates, Fees, Charges and Penalties, effective January 1, 2026, Table 3.

[269] Interstate Commission on the Potomac River Basin, *Data Centers and Water Use in the Potomac River Basin*, March 2026; and ICP-596, December 2025.

[270] Interstate Commission on the Potomac River Basin, *Data Centers and Water Use in the Potomac River Basin*.

[271] Interstate Commission on the Potomac River Basin, *Data Centers and Water Use in the Potomac River Basin*.

[272] Interstate Commission on the Potomac River Basin, *Data Centers and Water Use in the Potomac River Basin*.

[273] Interstate Commission on the Potomac River Basin, *Data Centers and Water Use in the Potomac River Basin*.

[274] Interstate Commission on the Potomac River Basin, *Data Centers and Water Use in the Potomac River Basin*.

[275] Interstate Commission on the Potomac River Basin, *Data Centers and Water Use in the Potomac River Basin*, methodology.

[276] Prince William Water, public frequently asked questions, retrieved August 23, 2026.

[277] JLARC Report 598, pp. 62–63. The six utilities served Fairfax, Henrico, Loudoun, Mecklenburg, and Prince William counties and the Town of Wise.

[278] Pinheiro Privette, Ana; Cai, Ximing; Dave, Hari; Sugg, Zach; and Colohan, Peter, "Data Center Expansion in Virginia: Closing Critical Gaps for Informed Water Planning and Permitting," Center for Secure Water, Department of Civil and Environmental Engineering, University of Illinois Urbana-Champaign, retrieved August 25, 2026: "JLARC estimated that Virginia data centers consumed approximately 2.1 billion gallons of water in 2023, an 86% increase since 2019 (~1.13 billion gallons), reflecting the sector's rapid growth," with the attribution hyperlinked to Report 598. The same document elsewhere attributes the 86 percent figure to a different source, stating that "Evidence from Northern Virginia utilities indicates that data center water use increased by approximately 86% between 2019 and 2023." **Cited as an instance of the misattribution, not for the figure.** The instance is offered because it is academic rather than journalistic; no criticism of the authors' wider analysis is intended or implied.

[279] JLARC Report 598, pp, Appendix B, pp. 101–102.

[280] Chapters 623 and 896, 2026 Acts of Assembly, amending Va. Code § 62.1-44.38, effective January 1, 2027.

[281] Senate Joint Resolution No. 25, 2024 Session, introduced by Senator Richard H. Stuart of Senate District 25, as reproduced in the SJ 25 report at pp. 1 and 2.

[282] Letter of Senators Russet Perry and Richard Stuart to Governor Abigail Spanberger, July 30, 2026, as quoted in Shannon Heckt, "Virginia senators request special session to act on 'deeply alarming' groundwater report," *Virginia Mercury*, July 31, 2026. **Press**, cited for the quotation; the letter itself was not obtained.

[283] Shannon Heckt, "After eastern groundwater report detailed aquifer concerns, Va. lawmakers consider policy shifts," *Virginia Mercury*, August 21, 2026. **Press.**

[284] Chapter 1, 2026 Acts of Assembly, Special Session I, approved June 29, 2026. Chapter 7, 2026 Acts of Assembly, approved February 20, 2026, was downloaded and searched; it contains no cooling, closed-loop, or water scarcity language.

[285] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 366, paragraph M.1.

[286] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 366, paragraph M.1, Item 366, paragraph M.2. Emphasis added.

[287] Chapters 623 and 896, 2026 Acts of Assembly, approved April 13, 2026, effective January 1, 2027, amending Va. Code § 62.1-44.38(C). House Bill 496 (Guzman) and Senate Bill 553 (Srinivasan), enacted in identical terms.

[288] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 477, paragraph D.

[289] Chapters 567 and 568, 2026 Acts of Assembly, adding Va. Code § 15.2-2209.4. House Bill 153 and Senate Bill 94.

[290] Chapter 591, 2026 Acts of Assembly. House Bill 323.

[291] Legislative Information System, 2026 Regular Session. HB589 (Simonds), subcommittee recommended laying on the table 7-Y 3-N, February 11, 2026; left in Committee on Agriculture, Chesapeake and Natural Resources, February 18, 2026. SB552 (Sturtevant), failed to report from Local Government with amendments 7-Y 7-N 1-A, February 2, 2026. HB387 (Krizek), tabled in Agriculture, Chesapeake and Natural Resources 22-Y 0-N, February 11, 2026. HB945 (Clark), left in Committee on Rules, February 18, 2026. HB501 (McAuliff), left in Committee on Rules, February 18, 2026.

[292] Legislative Information System, 2026 Regular Session. SB417 (Stuart), continued to the next session in Finance and Appropriations 15-Y 0-N, February 10, 2026. SB521 (Deeds), continued in Agriculture,

Conservation and Natural Resources 12-Y 2-N, February 3, 2026. HB591 (Simonds), HB1515 (Shin) and SB473 (Marsden) also continued.

[293] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 367, paragraph E.

[294] House Bill 30, Enrolled, June 25, 2026, Item 366, paragraph M.2. Emphasis added.

[295] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 366, paragraph M.2. Emphasis added. The comparison is a direct diff of the enrolled and chaptered documents as published at budget.lis.virginia.gov.

[296] House Bill 30, Enrolled, 2026 Special Session I, Item 366, paragraph M.2, as adopted from Conference Report amendment Item 366 #7c, compared against Governor's Recommendations to House Bill 30, June 26, 2026, Amendment 5, "Water supply planning," which strikes page 487, lines 32 through 44 of the enrolled bill and inserts the replacement paragraph. Both documents retrieved from budget.lis.virginia.gov on August 25, 2026. The enrolled paragraph contains no sentence restricting direct evaporative cooling. The inserted paragraph contains that sentence twice, once in the Cooling Water Scarcity Area prong and once in the Eastern Virginia Groundwater Management Area prong. The enrolled Cooling Water Scarcity Area prong required a data center to "certify to the Department" that it would use specified technologies "to the maximum extent practicable, as determined by the Department," which is why the rule-to-judgment change described in the text is scoped to the Eastern Virginia prong alone. **Primary.**

[297] Chapter 1, 2026 Acts of Assembly, Special Session I, Item 366, paragraph M.1.

[298] Joint Legislative Audit and Review Commission, *Data Centers in Virginia*, Report 598, December 2024. Northern Virginia is the largest data center market in the world, holding approximately 13 percent of reported global operational capacity and 25 percent of capacity in the Americas. Loudoun County's own published strategy document is titled *Data Center Capital of the World*; that is the county's characterization of itself rather than an independent finding.

[299] Virginia Regulatory Town Hall, retrieved August 23, 2026: chapter pages for 9VAC25-780 and 9VAC25-600; the Department of Environmental Quality's list of current in-progress regulatory actions; and title and full-text searches for the terms named.

[300] Virginia Regulatory Town Hall, Department of Environmental Quality Action 7042, Stage 11221, amending 9VAC25-200 to implement Chapters 623 and 896. Retrieved August 23, 2026.

[301] *Report of the State Water Commission to the Governor and the General Assembly*, Senate Document No. 56, Commonwealth of Virginia, Richmond, 2000. Enabling authority § 9-145.8; Chairman Senator Charles J. Colgan; Division of Legislative Services staff Martin G. Farber and Nicole M. Rovner. Twenty pages. Quoted passages at pp. 2 and 9.

[302] Va. Code Title 62.1, Chapter 24, §§ 62.1-242 through 62.1-253. Enacted 1989, c. 721.

[303] Va. Code § 62.1-246(A).

[304] Va. Code § 62.1-246(B); 9VAC25-220-40(B). Emphasis added.

[305] Va. Code § 62.1-243(A). Emphasis added.

[306] Va. Code § 62.1-243(B), (C), (D).

[307] Va. Code §§ 62.1-253, 62.1-245.

[308] 9VAC25-600-20(A). Derived from VR680-13-04 § 2, effective December 6, 1989.

[309] Virginia Administrative Code, Title 9, Agency 25, full chapter listing; 9VAC25-220 in its entirety; Virginia Regulatory Town Hall Form TH-05, periodic review of 9VAC25-220, dated August 8, 2001. All retrieved August 24, 2026.

[310] Va. Code § 62.1-257(A), (B). Emphasis added.

[311] Letter of the Loudoun County Preservation and Conservation Coalition Executive Committee, Loudoun Watershed Watch, Loudoun's Future, Loudoun Wildlife Conservancy, Piedmont Environmental Council and Save Rural Loudoun, *Blue Ridge Leader*, May 14, 2026. The three April 2026 community meetings and

the attendance figure are from the same letter. **The coalition's advocacy campaign and the county's response to it belong to the Loudoun case study; what this volume takes is the petition mechanism and the assessment.**

[312] Virginia Department of Environmental Quality, *DEQ News*, Volume 4, Number 6, June 24, 2025, reporting action of June 16, 2025.

[313] Virginia Department of Environmental Quality, "Drought Update" news release, distributed as a GovDelivery bulletin on April 17, 2026. **The bulletin number, URL and retrieval date were not recorded, and the release was not relocated in DEQ's GovDelivery archive in preparing this volume.** The four advisory counts and the ten named regions in the text come from that release and have not been checked against a second source. The Drought Monitoring Task Force status report for the corresponding April 2026 meeting carries the same advisory structure and is the document to cite once obtained.

[314] Office of the Governor, news release, July 15, 2026, reporting the Drought Monitoring Task Force recommendation of July 7, 2026. The Roanoke Drought Evaluation Region comprises Bedford, Campbell, Charlotte, Franklin, Halifax, Henry, Mecklenburg, Patrick, Pittsylvania and Roanoke counties and the cities of Danville, Martinsville, Roanoke and Salem.

[315] Office of the Governor, executive actions listing, Executive Orders 1 through 19, January 17 through August 18, 2026, retrieved August 24, 2026; Virginia Department of Environmental Quality drought page, retrieved August 24, 2026. Emphasis added.

[316] Virginia Department of Environmental Quality drought page, retrieved August 24, 2026. The post-August 18 status table is published only as a raster image and was not machine-readable.

[317] All streamflow figures in this section computed by the author from United States Geological Survey daily values for gages 01638500, 01646500, 01668000 and 01664000, retrieved August 24, 2026 through the USGS Water Services interface, and compared against full period-of-record daily statistics. Water year is October 1 through September 30. All water year 2026 values carry the USGS provisional qualifier.

[318] Tommy N. Turner, *Two Systems, One Drought*, Section 4, reporting DEQ's July 31, 2026 bulletin and the Governor's July 16 news conference. Cite all versions: 10.5281/zenodo.21816008. The figures in this section are later than that snapshot.

[319] Appalachian Power, historical lake levels table, annual minima and maxima 1966 to 2025, published at smithmtn.com. Record minimum 787.6 feet, January 23, 1970. Current reading from aep.com hydro recreation page, retrieved August 24, 2026, 10:29 a.m.

[320] Appalachian Power news release, May 15, 2026, "Appalachian Power Implements Drought Operations to Help Conserve Water at Smith Mountain Lake," quoting hydro manager Brannon Littleton.

[321] Appalachian Power news release, July 16, 2026, on the Department of Environmental Quality variance permitting early implementation of Water Management Plan Trigger 3.

[322] U.S. Army Corps of Engineers, Wilmington District, daily 0800 elevations for John H. Kerr Reservoir, 1953 through 2022, combined with USGS gage 02079490 for 2023 through 2026. Ranking computed by the author for the August 24 date across 70 years. All 2026 values provisional.

[323] Virginia Drought Monitoring Task Force, Drought Status Report, August 18, 2026.

[324] Appalachian Power hydro recreation page, retrieved August 24, 2026. One foot at Smith Mountain corresponds to approximately 6.5 feet at Leesville.

[325] Western Virginia Water Authority reservoir levels page and site notice, retrieved August 24, 2026.

[326] Interstate Commission on the Potomac River Basin, Cooperative Water Supply Operations on the Potomac, drought monitoring and operations. Daily drought monitoring begins when flow at the USGS gage at Point of Rocks, Maryland falls below 2,000 cubic feet per second; the Commission conducts it on behalf of Fairfax Water, the Washington Aqueduct and WSSC Water under the 1982 Water Supply Coordination Agreement. Retrieved August 25, 2026.

[327] Office of Governor Abigail Spanberger, news release, "Governor Spanberger, State Leaders Provide Update on Response to Drought in Roanoke Region," July 16, 2026, dateline Bedford, under the heading "CURRENT DROUGHT STATUS," Rain bullet: "Rain is approximately 7.8 inches below normal on average throughout the Commonwealth. This represents the second driest water year on record." Retrieved from governor.virginia.gov on August 25, 2026. **Emphasis on "water year" is added; the release does not emphasize the phrase.** *Two Systems, One Drought*, version 1.4, Section 4, endnote 75, quotes the same passage. **Primary.**

[328] NOAA National Centers for Environmental Information, Climate at a Glance, Virginia statewide precipitation, 1895 through 2026, retrieved August 24, 2026. Rankings computed by the author from the published series.

[329] Virginia State Water Commission, August 20, 2026, video time 3:24:54–3:25:16. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation. Jay Ford, Chesapeake Bay Foundation. Corrected caption track.

[330] Virginia State Water Commission, August 20, 2026, video time 3:23:40–3:23:57. Jay Ford, Chesapeake Bay Foundation. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation.

[331] Virginia State Water Commission, August 20, 2026, video time 3:25:46. Jay Ford, Chesapeake Bay Foundation. Recording and caption provenance as at the first note citing this hearing; Section 17.1 states the limitation.

[332] 9VAC25-780, historical notes, full chapter view retrieved August 24, 2026 with a currency stamp of that date. Amendments effective October 9, 2024 derive from *Virginia Register* Volume 41, Issue 2. The chapter originates in Volume 22, Issue 2, effective November 2, 2005, with intermediate amendments in 2006, 2015 and November 23, 2022.

[333] SJ 25 report, § 1.5, on state and regional water supply planning.

[334] 9VAC25-780-50(A). Emphasis added.

[335] Virginia Department of Environmental Quality, Water Supply Planning Resources page, "Important Dates," retrieved August 24, 2026.

[336] 9VAC25-780-45(B). Southwest Virginia comprises Big Sandy and Upper Tennessee Rivers 1 and 2; adjacent western areas include New River 1 and 2 and Upper James River 1 and 2.

[337] SJ 25 report, § 1.5, cited above.

[338] 9VAC25-780-45(C); Virginia Department of Environmental Quality reassignment approvals, February through June 2025, retrieved August 24, 2026.

[339] 9VAC25-780-50(D), and sections 70, 80, 90, 100, 110, 120 and 125 as referenced there.

[340] 9VAC25-780-100(H). The alternatives analysis requirement is at 9VAC25-780-100(I).

[341] 9VAC25-780-50(C). Emphasis added.

[342] Corpus as listed, all retrieved August 24, 2026. Individual State Water Control Board minutes files and individual kickoff meeting summaries were not opened one by one; the negative rests on the department's own published deadline statements and on the Town Hall meeting index.

[343] 9VAC25-780-50(B)(3); Virginia Department of Environmental Quality water supply planning meetings page, retrieved August 24, 2026.

[344] Virginia Department of Environmental Quality Guidance Memorandum GM 25-2002, effective November 8, 2025; fiscal 2027 grant round closing August 14, 2026; appropriation of $1,962,000 in the 2026 session.

[345] *Virginia Register of Regulations*, Volume 9, Issue 15, April 19, 1993, Notices of Intended Regulatory Action, pp. 2235–2237. Department of Environmental Quality contact of record: Thomas Felvey, Office of Water Resources Management. Written comments on the Shenandoah action due 4 p.m., June 1, 1993.

[346] *Virginia Register of Regulations*, Volume 9, Issues 21 and 22, Calendar of Events.

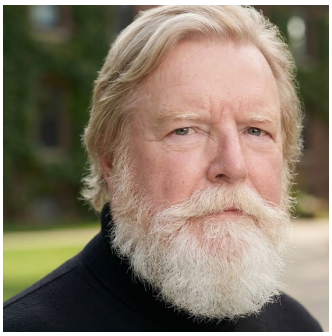
[347] *Virginia Register of Regulations*, Volume 9, Issue 25, September 6, 1993, pp. 4876–4877. VA.R. document filed July 21, 1993; comments due September 8, 1993.

[348] Systematic full-text search of the *Virginia Register of Regulations*, Volume 9 issues 16 through 26 and Volumes 10 through 14 complete, 115 issues, retrieved as documents from the Division of Legislative Services register archive and searched for "680-15-04," "680-15-05," "680-15-06," "Shenandoah River Surface Water," "James River Surface Water," and "North River Surface Water." Searched August 24, 2026.

[349] *Virginia Register of Regulations*, Volume 12, Issues 1, 5 and 9, Calendar of Events.

[350] Virginia Regulatory Town Hall Form TH-05, periodic review of 9VAC25-220, August 8, 2001.

About the Author



Tommy N. Turner is an independent researcher and writer who documents the local-government and energy dimensions of the data center build-out in Virginia. His series of jurisdiction-level case studies covers the counties and the fall-line corridor where Virginia's data center decisions have been made, refused, or contested, and the analytical volumes extend that work into the systems those decisions run on. Earlier volumes took the transmission network and the cost-allocation machinery, then generation. This one takes water. Like the rest of the series, this volume is assembled from primary records: Department of Environmental Quality groundwater and surface water withdrawal permits and the engineering reports filed with them, the agency's SJ 25 study to the General Assembly and the August 2026 State Water Commission record in which it was presented, including the posted slides and the meeting video, United States Geological Survey investigations and groundwater atlases for the Coastal Plain and for the western provinces, the 1993 Geologic Map of Virginia, the Virginia Administrative Code and the *Virginia Register*, and county drought plans, ordinances, and board and water authority records. His work spans data center fiscal and environmental policy, local public finance, and the governance questions the two raise, and he writes opinion and analysis on Virginia public affairs for outlets including the *Richmond Times-Dispatch*, the *Virginia Mercury*, the *Virginian-Pilot*, the *Roanoke Times*, *Cardinal News*, and *RTO Insider*. The case studies and analytical volumes are published as open, citable living editions, revised as the record moves. He works from Williamsburg and Christiansburg, Virginia.

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