

VIRGINIA • WATER UTILITIES • CAPITAL BRIEFING

From the sinking coast to a failed plant in the capital, Virginia's water plans are under pressure.

Hampton Roads is fighting sea-level rise and land subsidence with a billion-dollar aquifer-recharge program. Richmond lost its water for the better part of a week in January 2025. Data-center growth, PFAS, and a \$23 billion drinking-water bill are all landing on the same capital plan. Invizion helps Virginia utilities re-sequence a capital portfolio in a click — and defend every decision.

\$23.4B¹ Virginia's estimated 20-year drinking-water infrastructure needs — a C+ grade, with a further \$50B on the wastewater side.	2.2M² People served by Fairfax Water, Virginia's largest water utility and one of the 25 largest in the country.	~\$970M³ In federal WIFIA loans HRSD has closed for the SWIFT aquifer-recharge program in Hampton Roads.	58⁴ Virginia waterworks that detected PFAS above the EPA's new federal limits during 2021–2025 monitoring.
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THE VIRGINIA LANDSCAPE

Four forces are moving your project list at once

None of these is theoretical, and none of them waits for your next budget cycle. Coastal, capital, demand, and quality pressures are all reshuffling the projects on Virginia utilities' lists at the same time.

COASTAL — HAMPTON ROADS

A sinking coast, answered with an aquifer

Hampton Roads faces some of the fastest relative sea-level rise on the U.S. East Coast, and part of that is the land itself sinking: scientists attribute about 25% of the subsidence in parts of eastern Virginia to over-pumping of the Potomac Aquifer⁵

HRSD — the regional wastewater authority for 18 cities and counties, running nine major treatment plants at 225 MGD of capacity⁶ — is answering with SWIFT, injecting highly treated water back into the aquifer to slow subsidence, buffer sea-level rise, and cut James River nutrient loads by roughly 45% once full-scale plants come online starting in spring 2029⁵ It is a billion-dollar bet — nearly \$970M in WIFIA loans alone³

RELIABILITY — AGING PLANTS

Richmond showed how fast a plant can fail

On January 6, 2025, a winter-storm power outage flooded critical electrical and pumping systems at the City of Richmond's water treatment plant on the James River. A boil-water advisory ran January 6–11 across the capital city plus Henrico, Goochland, and parts of Hanover County. A state investigation later called the crisis “completely avoidable.”⁷

Richmond is not an outlier in age — only in visibility. Virginia carries roughly \$23.4B in 20-year drinking-water needs and \$50B in wastewater needs, and the report card warns that average customer rates sit “well below the level typically needed to support long-term capital investment.”¹

DEMAND — DATA CENTERS

The world's largest data-center market is here

Northern Virginia is the largest data-center market on earth — about 150 sites and 5,050 MW of power, roughly 13% of global operational capacity.⁸ The state's legislative watchdog found data-center water use “currently sustainable, but... growing,” and unconstrained power demand could double within a decade⁸

Loudoun Water built a reclaimed-water system in 2010 specifically to cool that industry; in 2025 it delivered more than 750 million gallons of reclaimed water, sparing an equal volume of drinking water.⁹ Every new campus is a capacity commitment that competes with renewal for the same capital.

QUALITY — PFAS & LEAD

New mandates, stacked on the old backlog

EPA's April 2024 rule sets enforceable limits for six PFAS compounds — 4 parts per trillion for PFOA and PFOS — with monitoring due by April 2027 and treatment in place by 2029. Across 2021–2025, 58 Virginia waterworks detected PFAS above those limits.⁴

Lead service line replacement is a parallel funded mandate: Virginia's first year of Bipartisan Infrastructure Law money alone included \$46.3M dedicated to lead lines and \$12.3M for emerging contaminants.¹¹ New obligations do not replace the renewal backlog — they stack on top of it, and something on the list has to move.

WHO RUNS VIRGINIA'S WATER

Mostly public and regional — with two regulated private providers

Virginia's water is dominated by large municipal and regional systems, backed by thousands of small waterworks. Two investor-owned providers, Virginia American Water and Aqua Virginia, are rate-regulated by the State Corporation Commission. The pressures are shared; the accountability path differs.

Public & regional utilities

Rates set by boards and city councils · capital approved in public

Fairfax Water ~2.2M people served · 345 MGD max capacity²

HRSD (Hampton Roads Sanitation District) Regional wastewater for 18 localities · SWIFT⁶

City of Richmond DPU Capital-region water · Jan 2025 plant failure⁷

Loudoun Water 80,000+ households · reclaimed water for data centers¹⁰

Norfolk & Virginia Beach Large coastal municipal systems

Thousands of the state's 2,800+ waterworks are small systems where the funding and workforce gaps hit hardest.¹

Investor-owned utilities

Rates & capital recovery regulated by the SCC

Virginia American Water ~350,000 people · Alexandria, Hopewell, Prince William¹⁴

Aqua Virginia (Essential Utilities) ~105,000 residents across 30+ counties¹⁵

Numerous small & rural systems Where affordability and compliance gaps concentrate

Both private providers answer to the Virginia State Corporation Commission for rates and capital recovery.¹⁶

Every capital dollar has to be defensible

Whether you answer to the SCC, a board, or a city council, the question is the same: why this project, why now, why at this cost? After the Richmond failure, Virginia's oversight bodies are asking it harder than ever.

Virginia State Corporation Commission (SCC) regulates rates and capital recovery for investor-owned water and wastewater utilities such as Virginia American Water and Aqua Virginia¹⁶

VDH Office of Drinking Water holds Safe Drinking Water Act primacy — PFAS monitoring, lead service line inventories, and, after Richmond, notices of alleged violation and consent orders⁷

Virginia DEQ permits wastewater discharges and enforces Chesapeake Bay nutrient limits — the WIP3 targets that drive projects like HRSD's SWIFT.⁵

EPA's 2024 PFAS rule sets 4 ppt limits for PFOA and PFOS, with monitoring by 2027 and treatment by 2029 — a compliance-capital clock for dozens of Virginia systems.⁴

Boards & city councils approve municipal capital plans in public — Fairfax Water's board, Richmond's and Norfolk's councils — in front of ratepayers.

The money is moving — can your plan absorb it?

Virginia utilities have more capital funding available than they have had in a generation. The constraint is no longer only dollars — it is readiness: which projects are shovel-ready, which qualify, and how the timing lines up with everything else on the list.

Clean Water Revolving Loan Fund — more than \$4 billion invested in Virginia wastewater and water-quality projects since 1987, administered with the Virginia Resources Authority¹²

Drinking Water Revolving Loan Fund — over \$700 million invested since 1998, with recent 20-year loan rates around 3%.¹³

Bipartisan Infrastructure Law — in FY2022 alone Virginia drew about \$126M in SRF supplements, including \$46.3M for lead service lines, \$29.4M for drinking water, and \$36.4M for clean water.¹¹

WIFIA loans — HRSD has closed roughly \$970M for SWIFT (\$225M in 2020, \$477M in 2021, \$268M in 2024), and Alexandria closed \$321M for its RiverRenew tunnel.³

VIRGINIA WATER, IN BRIEF

Questions Virginia utility leaders are asking

Short, sourced answers — the same facts we will dig into on a call, in the context of your system.

What caused the January 2025 Richmond water crisis?

A winter-storm power outage on January 6, 2025 flooded critical electrical and pumping systems at Richmond's water treatment plant, collapsing production and pressure. A boil-water advisory ran January 6–11 across the city plus Henrico, Goochland, and parts of Hanover County. A state root-cause review released that April found the failure “completely avoidable” and traced it to operating choices and deferred maintenance; VDH issued notices of violation and consent orders⁷

What is HRSD's SWIFT project and why does it matter?

SWIFT — the Sustainable Water Initiative for Tomorrow — treats wastewater to drinking-water quality and injects it into the Potomac Aquifer to slow land subsidence (about 25% of eastern Virginia's sinking is tied to aquifer over-pumping), buffer sea-level rise, and cut James River nutrient loads by roughly 45% once full-scale plants start coming online in spring 2029. HRSD has closed nearly \$970M in WIFIA loans for the program⁵³

How are data centers affecting Virginia's water?

Northern Virginia is the world's largest data-center market — roughly 150 sites and 5,050 MW of power. The state's legislative watchdog judged data-center water use “currently sustainable, but... growing.” Loudoun Water built a reclaimed-water network in 2010 to cool the industry and delivered more than 750 million gallons of reclaimed water in 2025, protecting drinking-water supply⁸⁹

Who sets water rates in Virginia?

Investor-owned utilities — Virginia American Water and Aqua Virginia — have rates and capital recovery regulated by the State Corporation Commission. Municipal and regional systems such as Fairfax Water, Richmond, and Norfolk set rates through their own boards and city councils. Either way, capital spending has to be justified to a governing body and, increasingly, to ratepayers⁵⁶

What funding is available for Virginia water infrastructure?

The Clean Water Revolving Loan Fund has invested more than \$4 billion since 1987 and the Drinking Water Revolving Loan Fund over \$700 million since 1998. Bipartisan Infrastructure Law supplements added about \$126 million in FY2022 alone — including \$46.3M for lead lines — and EPA's WIFIA program has lent roughly \$970M to HRSD for SWIFT plus \$321M to Alexandria¹²¹³¹¹³

How does Invizion help Virginia water utilities plan capital?

Invizion is scenario-based capital portfolio optimization for water utilities. It lets you model how a coastal-resilience mandate, a PFAS deadline, a WIFIA award, or a plant failure like Richmond's reshuffles your whole project list, re-sequence the portfolio automatically against your constraints, and keep a defensible record of every trade-off for the SCC, your board, or ratepayers. The best next step is a short first meeting to look at it against your own program.

REFERENCES

Sources

Every figure in this briefing is tied to a primary or authoritative source.

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ABOUT INVIZION

Capital program optimization for utilities

Invizion is a purpose-built capital lifecycle management platform for water and wastewater utilities. It integrates budgeting, CIP, scenario analysis, and funding-source tracking in one system — so utilities can re-sequence a capital portfolio in a click and demonstrate audit-ready, defensible decisions to regulators, boards, and rating agencies.

See what a defensible Virginia capital plan looks like — book a 20-minute first meeting.

Book your first meeting →