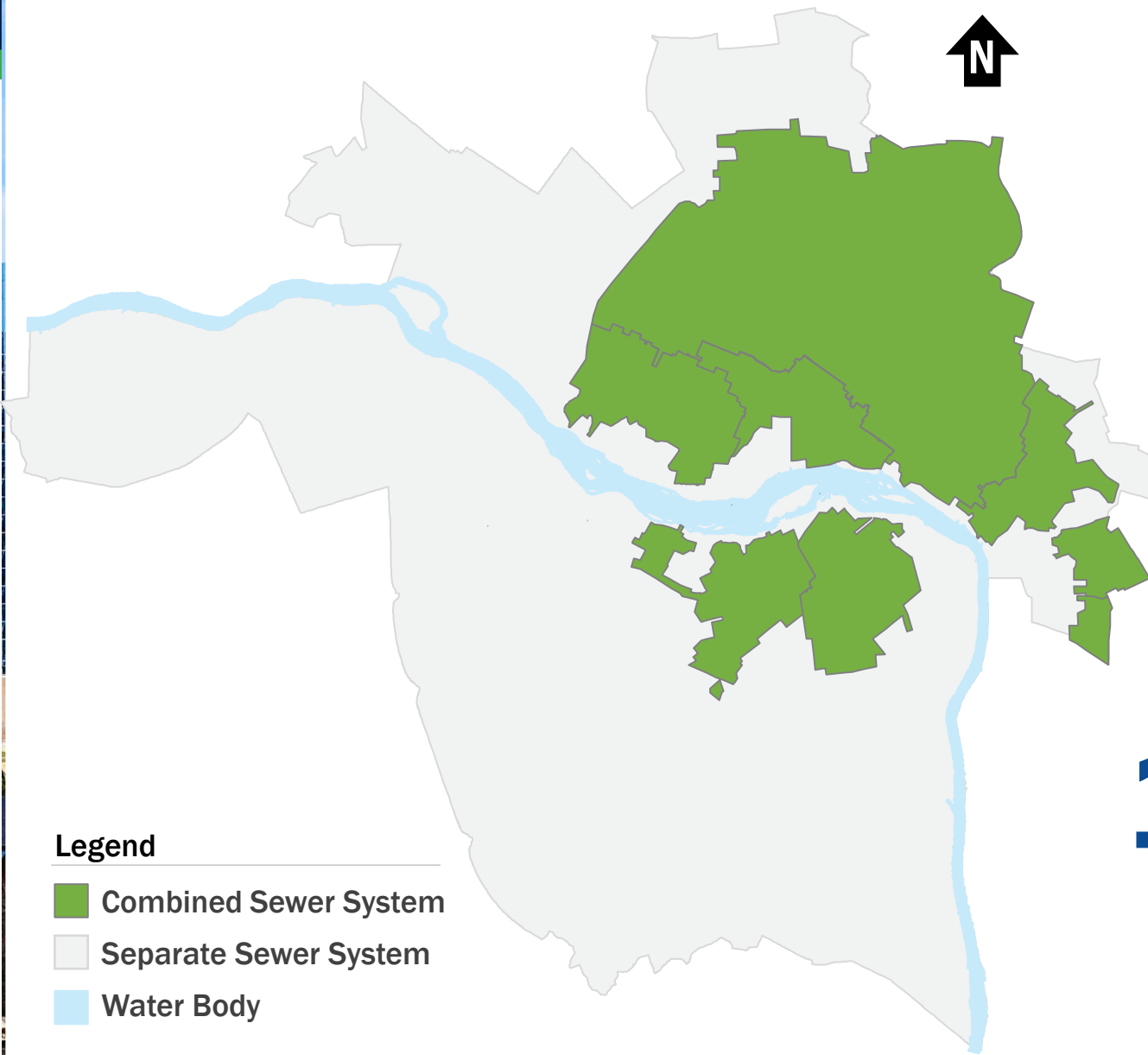


Combined Sewer System Program Update

Government Operations Committee
March 26, 2025



Richmond DPU Wastewater Systems at-a-Glance



8 wastewater
pumping stations

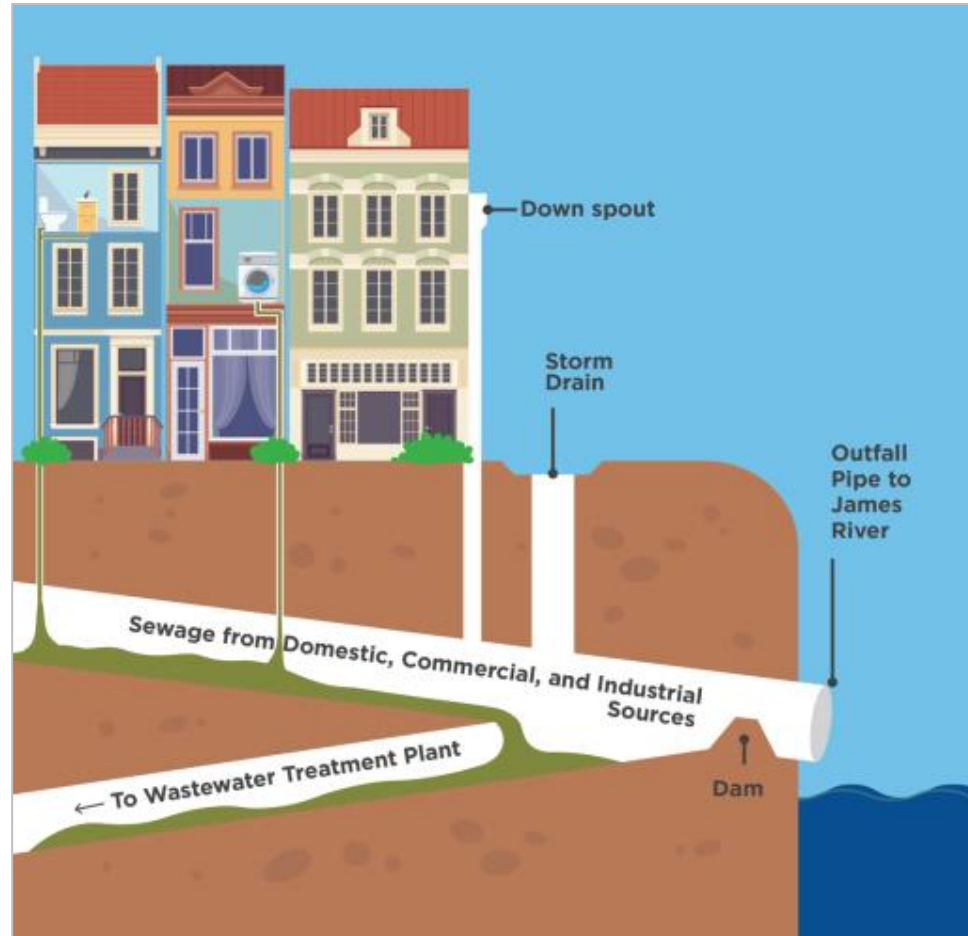
25 combined sewer outfalls

140 million gallons per day of
wastewater treatment
capacity

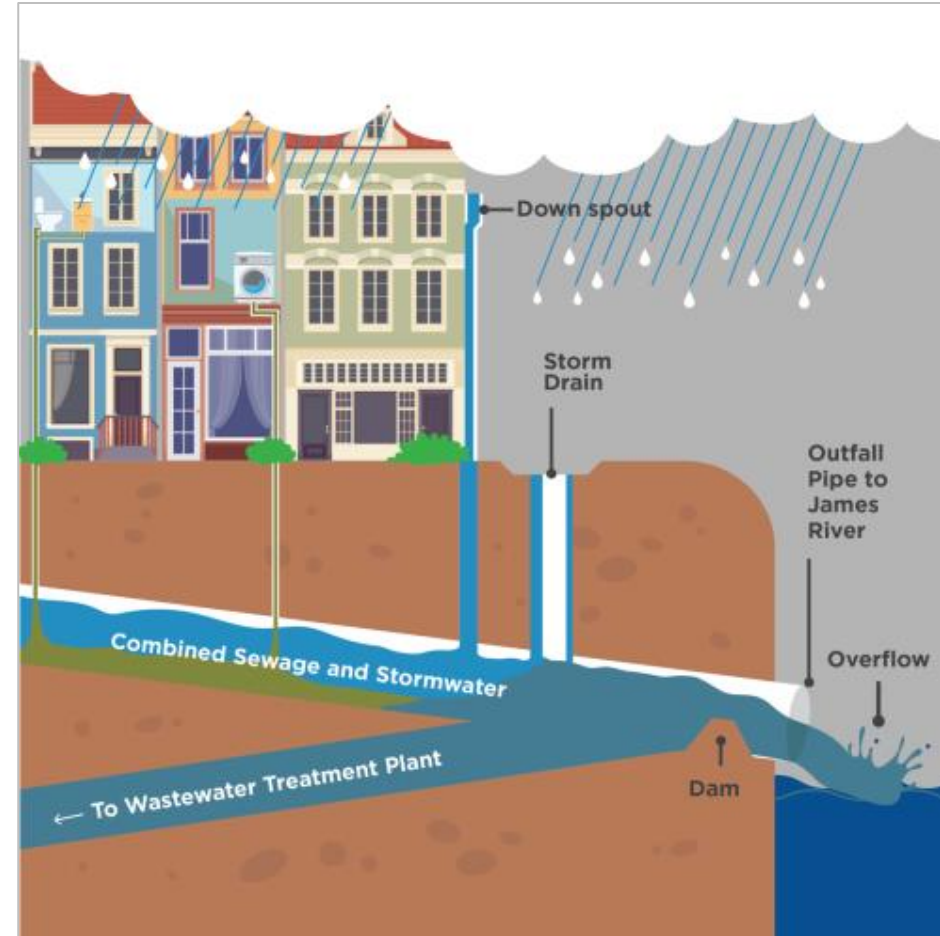
1,000 miles of sewer
interceptors and mains

How Richmond's legacy combined sewer system works

Dry Weather Conditions



Wet Weather Conditions



Combined Sewer System Regulatory Framework

2005 CSO
Special
Order by
Consent



2020 CSO
Law
(SB 1064)






Amended
Existing Special
Order by
Consent



Interim Plan
Final Plan



Richmond's DPU has been working for decades to improve water quality in the James River

Phase	Phase 1 (1970 – 1988)	Phase 2 (1988 – 2002)	Phase 3 (2002 – 2020)
Project Details	2 Projects <ul style="list-style-type: none"> • 50 MG Shockoe Retention Basin • WWTP Improvements 	6 Projects <ul style="list-style-type: none"> • 7 MG Hampton-McCloy Storage Tunnel • New conveyance sewers • Improvements focused on Fall of the James and Haxall Canal 	16 Projects <ul style="list-style-type: none"> • WWTP Capacity Expansion from 75 to 140 MGD • Gillies Creek outfall improvements along • Various sewer separation projects
Cost	\$420M ¹	\$226M ¹	\$110M ¹
Project Photos	 <p>Shockoe Retention Basin</p>	 <p>Hampton-McCloy Storage Tunnel</p>	 <p>WWTP Capacity Expansion to 140 MGD</p>

Notes:

1. Cost of projects adjusted to 2024 dollars

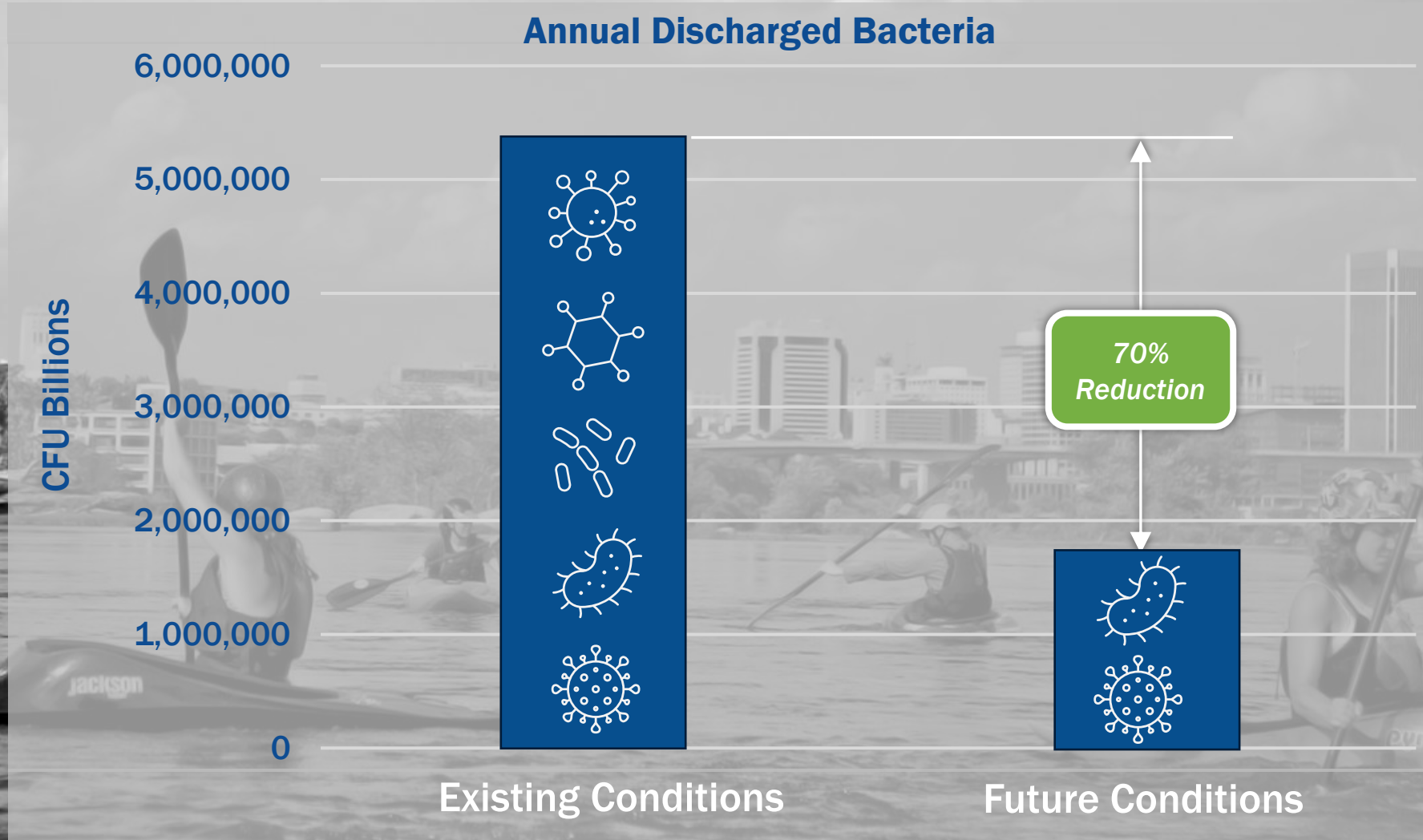
Regulatory Framework

The 2020 CSO Law (SB1064) amended the 2005 Special Order by Consent by accelerating project implementation

	Plan Due Date	Initiate Construction and related activities	Complete Construction
Interim Plan	✓ July 1, 2021	✓ July 1, 2022	July 1, 2027
Final Plan	✓ July 1, 2024	July 1, 2025	July 1, 2035

Interim & Final Plan Purpose

Reduce bacteria load to the James River from Richmond's combined sewer system by 70%



Note: A colony-forming unit (CFU) is a unit of measure for bacteria in water

Interim and Final Plan Project Selection

Identify the most efficient, cost-effective, quick
turnaround projects to reduce CSO volume

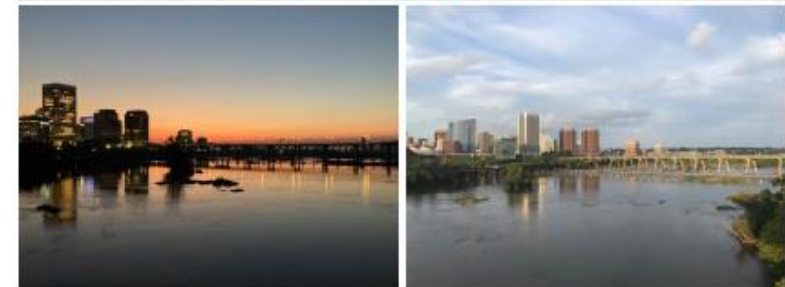
	Identification and Screening	Evaluation	Selection	Cost	Performance
Interim Plan	20	18	10	\$51M	182 MG CSO Reduction
Final Plan	34	20	4	\$575M	774 MG CSO Reduction
Total	54	38	14	\$626M	956 MG CSO Reduction

The Final Plan was approved by DEQ on August 8, 2024

- Developed in close coordination with DEQ and our Public Stakeholder Group
- Project Selection Criteria
 - Performance
 - Cost
 - Schedule
 - Qualitative Factors

City of Richmond, Virginia
Department of Public Utilities
Final Plan Report

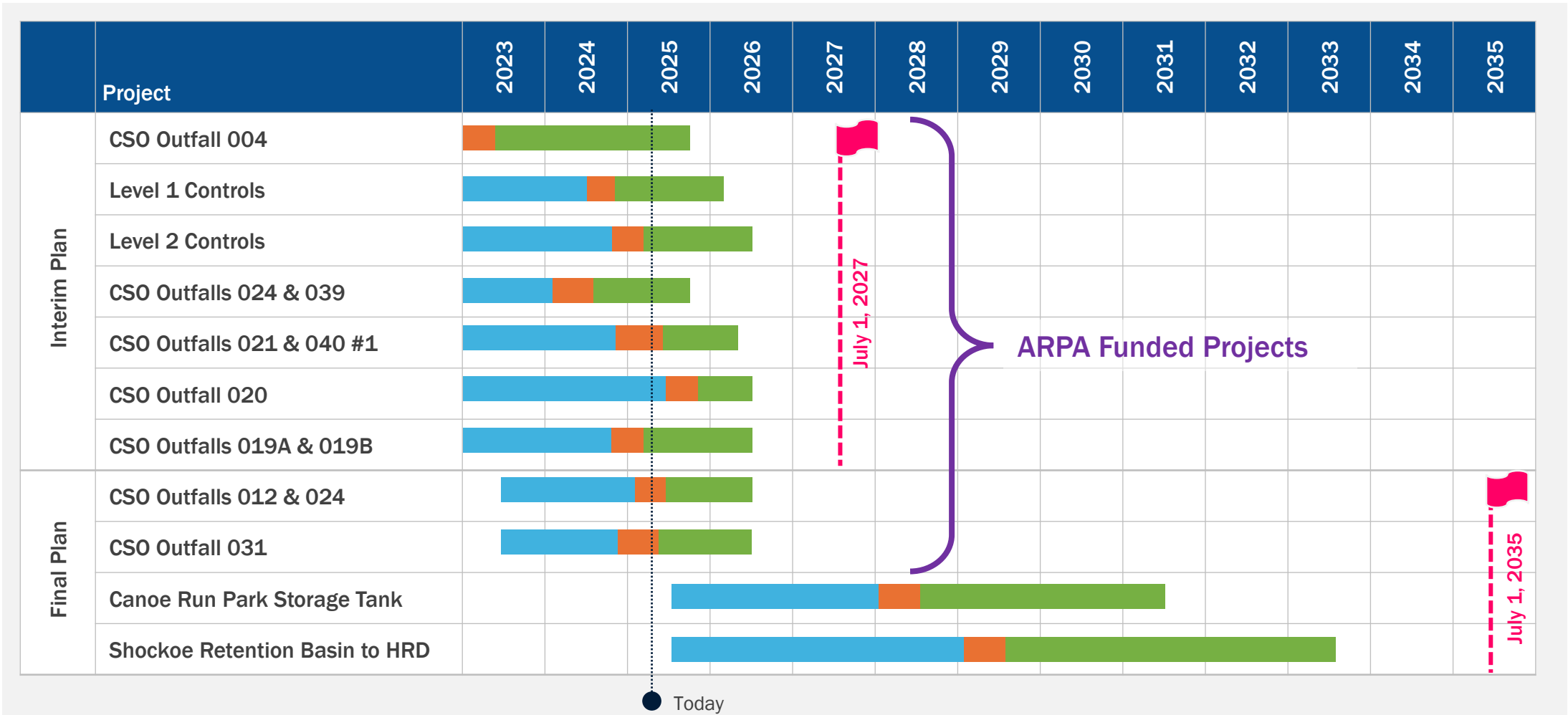
May 30, 2024



Prepared by Brown and Caldwell



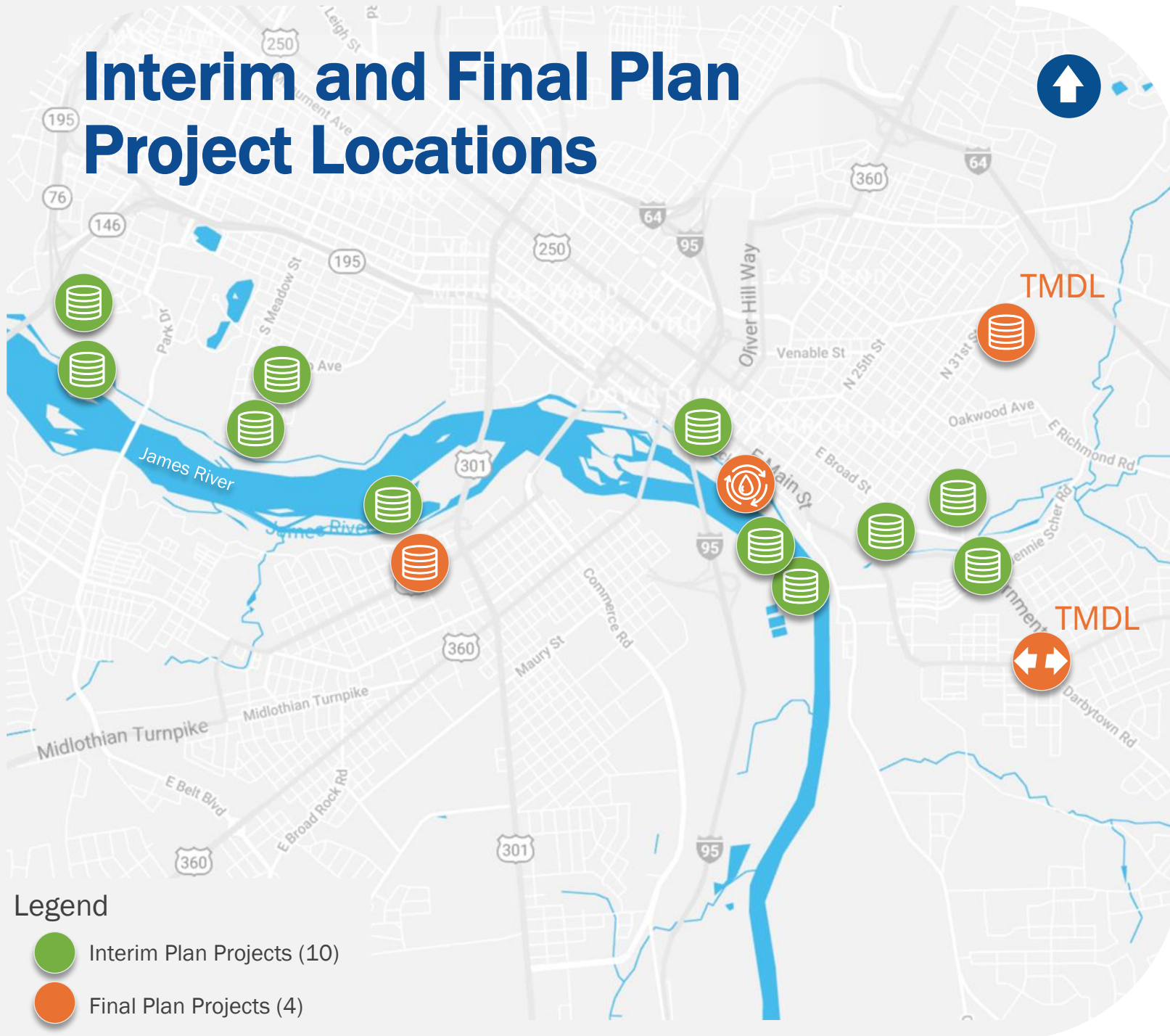
Interim and Final Plan Project Schedules



Legend



Interim and Final Plan Project Locations



CSO Control Methods



Storage

Optimization of existing facilities and new tanks that capture CSO volume



Treatment

Disinfect CSO before it is discharged to receiving water bodies



Separation

Replace the CSS with separate sanitary and stormwater sewer systems

Legend



Interim Plan Projects (10)

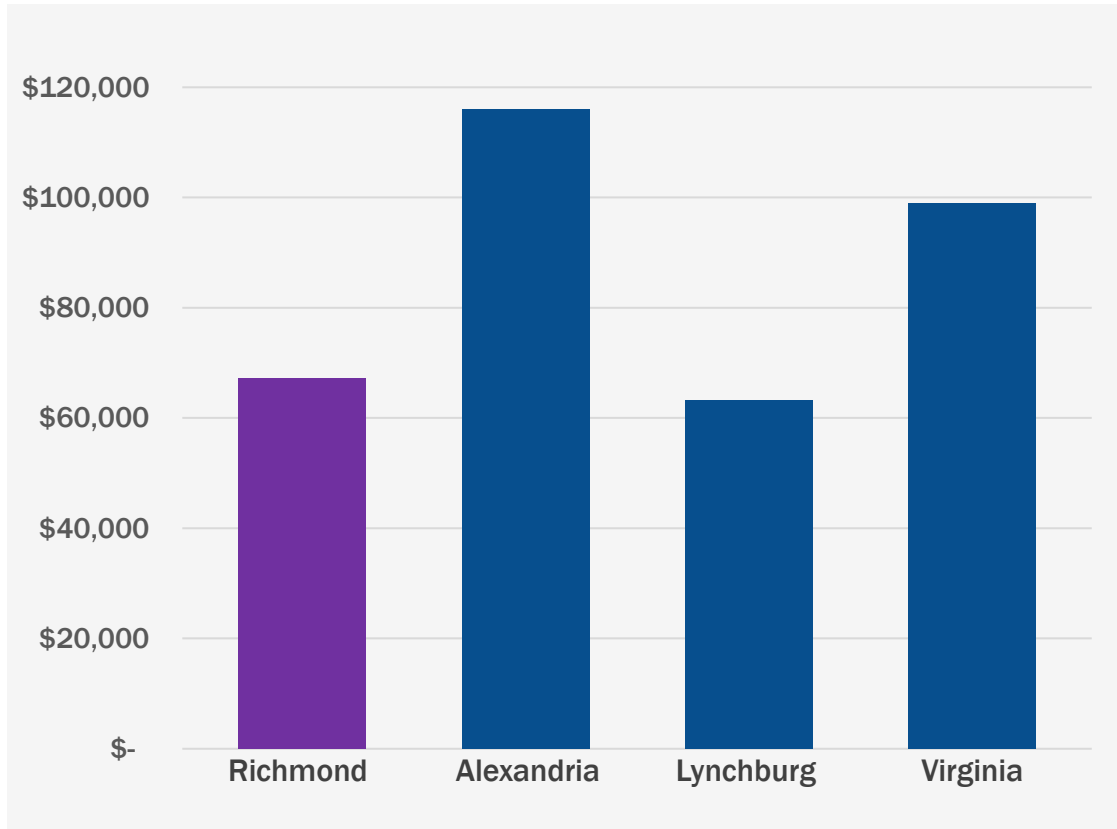


Final Plan Projects (4)

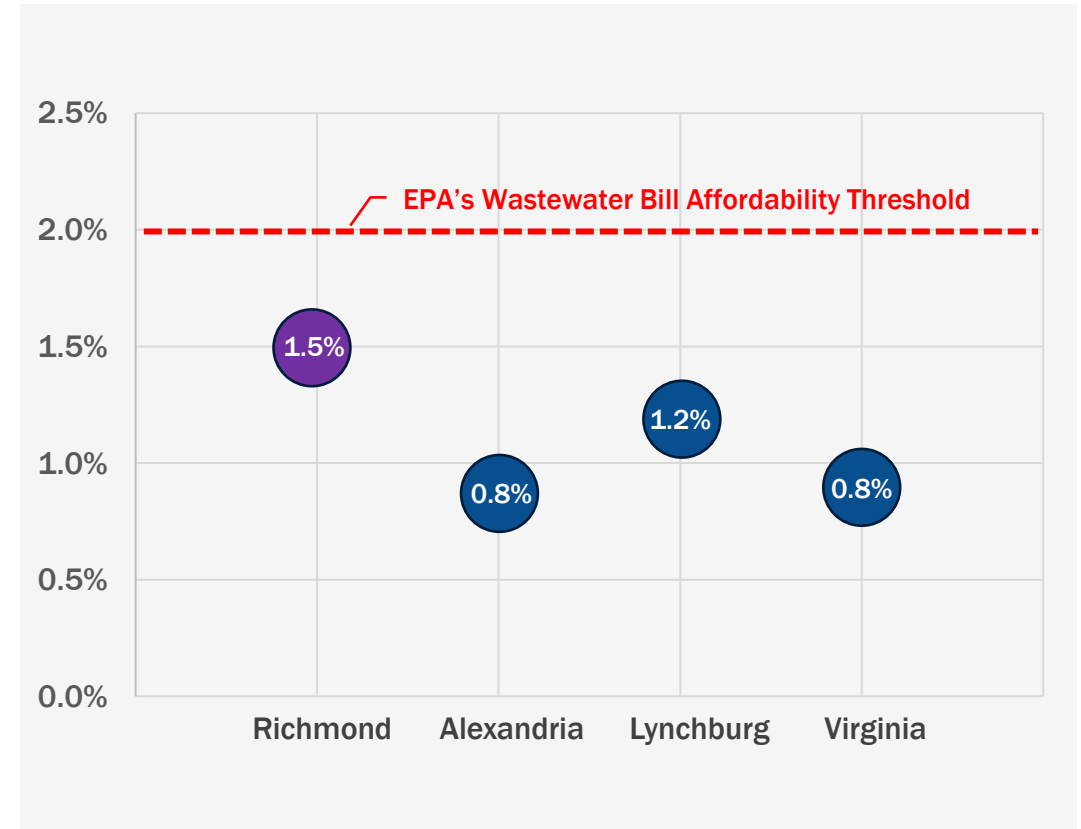
The City's Current Financial Capability

Richmond's Wastewater rates are already among the highest in the Commonwealth due to significant past investments in CSO Control

Median Household Income (MHI)



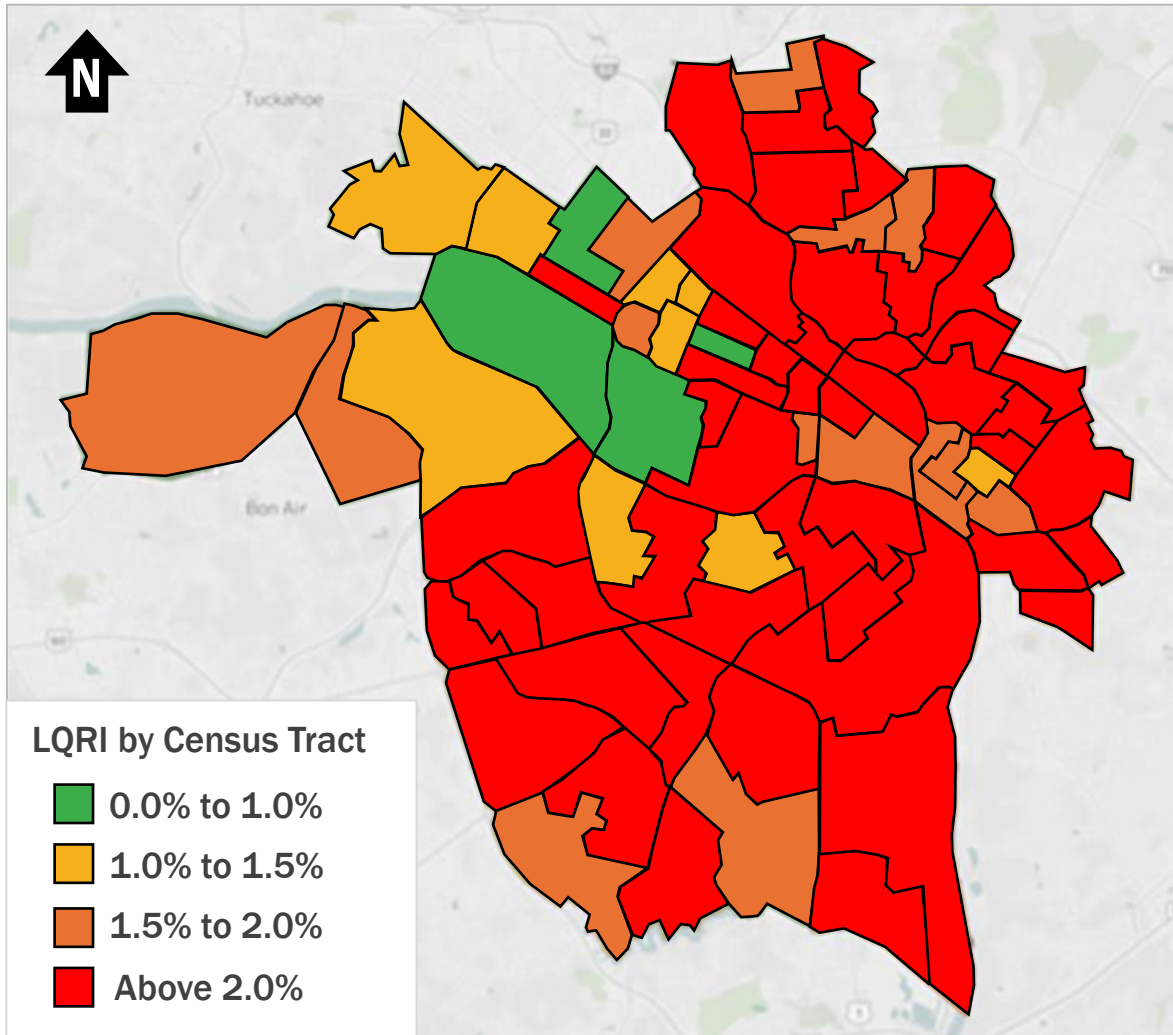
Annual Wastewater Bill Percentage of MHI



*Richmond's annual wastewater bill based on an average usage of 7ccf/month

The City's Current Financial Capability

The impact of wastewater bills on Richmond residents with lower income levels as represented by the Lowest Quintile Residential Indicator (LQRI)



59% of residential customers reside in census tracts designated as “High Impact” with an average customer bill over 2% of the lowest quintile income (<\$21,000)

State Funding Needed to Meet State Mandate

Funding timeline for General Assembly Sessions FY2025 through FY2028

GA Session (Fiscal Year)	Requested Amount	Appropriated Amount
FY2025	Amend \$50M to \$150M	\$75M
FY2026	\$150M	\$25M
FY2027	\$100M	TBD
FY2028	\$100M	TBD
Total	\$500M	\$100M

Note: FY25/26 State Grant funds were not set aside in the Virginia CSO Matching Fund

Audits

Information
Submitted to OCA
Additional
Information
Requested

Wholesale Water Contracts

- Audit Number: 2021-08
- Comment: We recommend the Director of the Department of Public Utilities further research the billing variances and prior balances noted in the Auditors' testing.
- Status: Audit team provided the specific details on variances, DPU currently reviewing.

Audits

Information
Submitted to OCA
Additional
Information
Requested

Continuous Auditing

- Audit Number: 2022-12
- Comment: We recommend the Director of Public Utilities ensure that all paid overtime noted within RAPIDS is adequately documented and approved.
- Status: Additional Information: Requested another sample, most recent annual training, and violations tracking form.

Audits

Information
Submitted to OCA
Additional
Information
Requested

DPU Contract Compliance

- Audit Number: 2023-02
- Comment: We recommend that the DPU Director ensure that the lateral valves are exercised during the hydrant inspections and observations are documented.
- Status: Additional Request: Completed Hydrant Inspection Form.

Audits

Closed:
March 2025

Priority: High

DPU Contract Compliance

- Audit Number: 2023-02
- Comment: We recommend that the DPU Director develop and implement processes and procedures to properly administer the hydrant repairs and replacements to ensure that the hydrants are put back into service timely including:
 - Establishing a formal goal for hydrant repairs/replacements when utility markings are required; and
 - Documenting any encountered delays.

Audits

Information
Submitted to OCA
Additional
Information
Requested

DPU Contract Compliance

- Audit Number: 2023-02
- Comment: We recommend that the DPU Director establish and implement a payment process that includes a defined billing time frame for completed work and a reconciliation process to ensure the billed quantities agree to the Inspector's pay sheets and contract rates prior to payment.
- Status: Additional Request: Additional information on the reconciliation process needed.

Audits

Information
Submitted to OCA
Additional
Information
Requested

DPU Contract Compliance

- Audit Number: 2023-02
- Comment: We recommend that the DPU Director develop and implement a transition plan, to retain knowledge during staffing turnover.
- Status: Additional Request: Memo outlining plan.

Audits

Information
Submitted to OCA
Additional
Information
Requested

DPU Contract Compliance

- Audit Number: 2023-02
- Comment: We recommend that the DPU Director develop and implement a plan to address the Water Distribution Division's needs that are currently being fulfilled by the Contractor's staff.
- Status: Additional Request: Memo outlining plan.

Audits

Information
Submitted to OCA
Additional
Information
Requested

DPU Contract Compliance

- Audit Number: 2023-02
- Comment: We recommend the DPU Director automate the inspection documentation process and centralize the tracking for non-hydrant work.
- Status: Additional Request: OCA requests to walkthrough system and completed inspection forms.

Audits

Information
Submitted to OCA
Additional
Information
Requested

DPU Contract Compliance

- Audit Number: 2023-02
- Comment: We recommend that the DPU Director continue to develop and implement a process to track and reconcile the materials issued to and used by the Contractor.
- Status: Status: Additional Request: OCA requests additional information on material tracking, a memo will be provided.

Audits

DPU Contract Compliance

- Audit Number: 2023-02
- Comment: We recommend that the DPU Director develop and implement written inspection policies and procedures for the Water Distribution Division.
- Status: Procedure provided to OCA, under review.

Audits

Information
Submitted to OCA
Additional
Information
Requested

DPU Billings

- Audit Number: 2023-09
- Comment: We recommend the Director of the Department of Public Utilities ensure the FY22 MetroCare entries made in error are corrected.
- Status: In review by DPU

Audits

Potential to be
Closed

Priority: High

DPU Billings

- Audit Number: 2023-09
- Comment: We recommend the Director of the Department of Public Utilities establish a reconciliation process that includes ensuring bad debt accounts are returned to the City and/or collected accurately and in their entirety.
- Status: DPU has reinstated the full collections process, which includes customer bill notifications, field disconnections, third party collection efforts and lien activity. Additionally, DPU has partnered with PromisePay, a digital platform to help customers avoid disconnection with as little as \$10.00 down and up to 36 months of repayment on outstanding arrears. Training included. DPU considers this response to be satisfactory for this recommendation and hereby request closure of this audit item.

Audits

DPU Billings

- Audit Number: 2023-09
- Comment: We recommend the Director of the Department of Public Utilities formalize and implement a process to review the exceptions worked by staff.
- Status: Submitted for review by Audit.

Audits

DPU Billings

- Audit Number: 2023-09
- Comment: We recommend the Department of Public Utilities Deputy Director review and update all outdated billing and collections policies and procedures to reflect the current work environment.

Audits

Information
Submitted to OCA
Additional
Information
Requested

DPU Billings

- Audit Number: 2023-09
- Comment: We recommend the Department of Public Utilities Deputy Director develop a formal review process to ensure all required utility accounts are being reviewed for the following:
 - Deposit determinations
 - Deposit calculations when necessary
 - Supporting notes and documentation
- Status: In review by DPU

Audits

DPU Billings

- Audit Number: 2023-09
- Comment: We recommend the Department of Public Utilities Deputy Director develop a process to ensure that supporting documents related to utility deposits are retained according to VA Records Retention and Disposition Schedule GS-07.
- Status: Submitted for review by Audit.

Audits

DPU Billings

- Audit Number: 2023-09
- Comment: We recommend the Department of Public Utilities Deputy Director add all commercial reset meters for new accounts to the EWQ Referral Report for commercial turn-ons to be reviewed for deposits.
- Status: In review by DPU

Priority: High

Audits

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend that the DPU Main Warehouse Program and Operations Supervisor develop and implement a process to ensure that the inventory data is accurate and complete, including at a minimum:
 - Reconciling the system quantities to physical on-hand quantities,
 - Capturing material costs, where appropriate, and
 - Updating inventory locations as needed.
- Status: in review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend that the DPU Main Warehouse Program and Operations Supervisor develop and implement a process to validate the quantity and existence of items delivered to job sites. For example, obtain packing slips and bills of lading.
- Status: in review by DPU

Audits

Priority: High

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend that the DPU Main Warehouse Program and Operations Supervisor develop and implement a process to ensure materials and supplies delivered directly to job sites are immediately requisitioned/issued out of the inventory system.
- Status: In review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend the DPU Senior Deputy Director over Finance work with the Finance Department to determine if any additional actions are needed to correct inventory discrepancies.
- Status: In review by DPU

Audits

Priority: High

Information
Submitted to OCA
Additional
Information
Requested

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend that the DPU Main Warehouse Program and Operations Supervisor develop, document, and implement an inventory count process. At a minimum, this process should ensure an appropriate amount of inventory is counted, assess which inventory items should be counted, and assess the frequency of the counts required.
- Additional request: established schedule for count process.

Audits

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend the DPU Senior Director develop performance measures for the inventory count process and ensure the performance goals are met. Examples of performance goals include dollar value of adjustments, quantity of adjustments, number of accurate accounts, and percent of accurate inventory records.
- Additional request: performance measures

Audits

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend that the DPU Main Warehouse Program and Operations Supervisor implement adequate segregation of duties or mitigating controls in the inventory count process.
- Additional request: clarification on roles

Audits

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend that the DPU Main Warehouse Program and Operations Supervisor develop and implement criteria identifying which count variances need to be researched to identify root causes and ensure the cause is documented to support the inventory adjustments.
- Additional request: adjustment documentation

Audits

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend that the DPU Main Warehouse Program and Operations Supervisor develop and implement a process to:
 - establish minimum and maximum levels and re-order quantities,
 - periodically reviewing the inventory data to assess existing minimum and maximum levels and make changes as needed; and
 - optimize the level of inventory maintained.
- Additional request: process clarification

Audits

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend the DPU Senior Director develop and implement a process for disposing of obsolete inventory.
- Additional request: disposal report

Audits

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend that the Director of Public Utilities properly safeguard the inventory items currently stored in Building 20.
- Additional request: inventory report

Audits

Closed:
March 2025

Priority: High

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend that the Director of Public Utilities follow through with demolishing Building 20 and ensure precautions are taken for any employees entering the building.

Audits

Citywide Warehousing & Inventory Management: DPU Main Warehouse (Phase 1)

- Audit Number: 2025-03
- Comment: We recommend that the DPU Main Warehouse Manager develop and implement written policies and procedures to govern and guide warehouse operations and inventory management. At a minimum, these policies and procedures should address all recommendations in this report, including processes for ordering, receiving, storing, distributing, disposing, tracking, counting, and reconciling inventory. They should also define employees' roles and responsibilities and establish accountability.
- Additional request: additional documentation

Audits

Priority: High

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the DPU Senior Director establish a process to define, document, and communicate what items should be classified as stock and non-stock items in the WWTP Warehouse. Further, assess the feasibility of centralizing the process of ordering and receiving stock and non-stock items through the WWTP Warehouse.
- Status: In review by DPU

Audits

Priority: High

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the DPU Senior Deputy Director over the WWTP Warehouse establish a process to ensure all materials are tracked and documented on work orders to include the following:
 - The description and quantity of the material used.
 - The asset being serviced if not otherwise noted on the work order.
- Status: In review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the DPU Senior Deputy Director over the WWTP Warehouse ensure the CAN-AM chains referenced throughout this report be set up as a stock item in the inventory system.
- Status: In review by DPU

Audits

Priority: High

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the WWTP Warehouse and Materials Supervisor conduct a full inventory count to establish a baseline for quantities on hand.

Once a baseline is established, develop and implement a process to ensure that the inventory data is accurate and complete, including at a minimum:

- Reconciling the system quantities to physical on-hand quantities,
 - Capturing costs, where appropriate,
 - Updating inventory locations as needed,
 - Reconciling the quantity of inventory received in and issued from the warehouse to the inventory system to ensure they are accurately keyed, and
 - Reviewing the system conversion factors for accuracy.
- Status: In review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the WWTP Warehouse and Materials Supervisor continue to research the unidentified items stored in the warehouse and add applicable items to inventory or dispose of them where appropriate in accordance with the City's Surplus Property policy.
- Status: In review by DPU

Audits

Priority: High

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-03
- Comment: We recommend that the WWTP Warehouse and Materials Supervisor develop, document, and implement a formal inventory count process. At a minimum, this process should ensure an appropriate amount of inventory is counted, assess which inventory items should be counted, and assess the frequency of the counts required.
- Status: In review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the WWTP Warehouse and Materials Supervisor work with the Mainsaver representative to assess the feasibility of using the inventory count feature.
- Status: In review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the DPU Senior Director develop performance measures for the inventory count process and ensure the performance goals are met. Examples of performance goals include dollar value of adjustments, quantity of adjustments, number of accurate accounts, and percent of accurate inventory records.
- Status: In review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the WWTP Warehouse and Materials Supervisor implement adequate segregation of duties or mitigating controls in the inventory count process.
- Status: In review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the WWTP Warehouse and Materials Supervisor develop and implement criteria identifying which count variances need to be researched to identify root causes and ensure the cause is documented to support the inventory adjustments.
- Status: In review by DPU

Audits

Priority: High

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend the WWTP Warehouse and Materials Supervisor develop and implement a process to:
 - establish minimum and maximum levels and re-order points,
 - periodically reviewing the inventory data to assess existing minimum and maximum levels and make changes as needed; and
 - optimize the level of inventory maintained and document justification for when maximum levels are exceeded.
- Status: In review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend the WWTP Warehouse and Materials Supervisor develop and implement a process to identify idle inventory and follow up with the trades supervisors to determine if the items are obsolete or need to be deactivated in the inventory system.
- Status: In review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend the DPU Senior Director develop and implement a process for disposing of obsolete inventory in accordance with the City's Surplus Property policy.
- Status: In review by DPU

Audits

Priority: High

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the DPU Senior Deputy Director over the WWTP Warehouse establish a formalized process to review Mainsaver user access and ensure appropriate access levels are granted based on job duties and responsibilities, including removing any unnecessary access to the warehouse inventory data.
- Status: In review by DPU

Audits

Citywide Warehousing & Inventory Management: DPU Wastewater Treatment Plant Warehouse (Phase 2)

- Audit Number: 2025-05
- Comment: We recommend that the WWTP Warehouse and Materials Supervisor develop and implement written policies and procedures to govern and guide warehouse operations and inventory management functions. At a minimum, the policies and procedures should address all recommendations in this report, including the process for ordering, receiving, storing, distributing, disposing, tracking, counting, and reconciling inventory. Policies and procedures should also include employees' roles and responsibilities and establish accountability.
- Status: In review by DPU