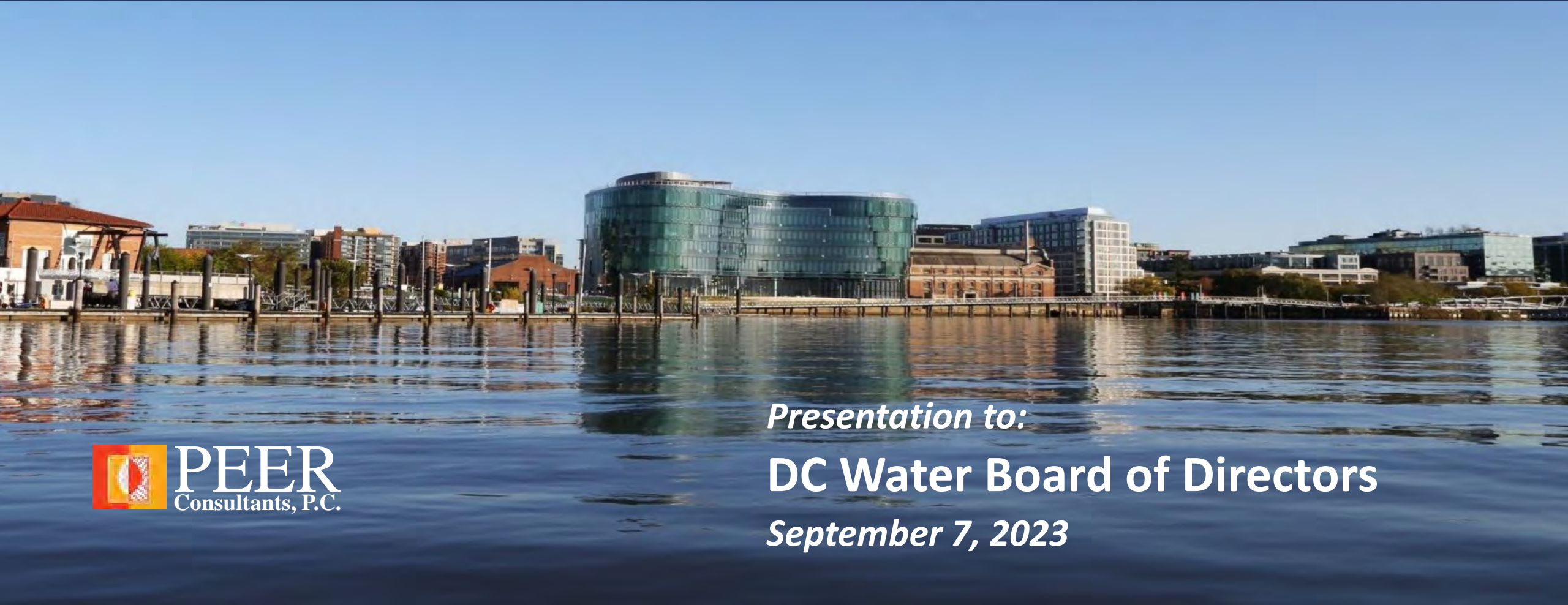




2023

Independent Engineering Assessment of the DC Water Wastewater and Water System



Presentation to:

DC Water Board of Directors

September 7, 2023

Agenda

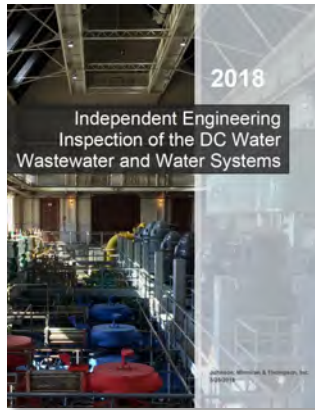
- Introduction
- Methodology
- Summary of the Report Sections
- Summary of the Findings
- Key Recommendations
- Questions and Discussion



Around 1810, the first sewer structures in the District were constructed.

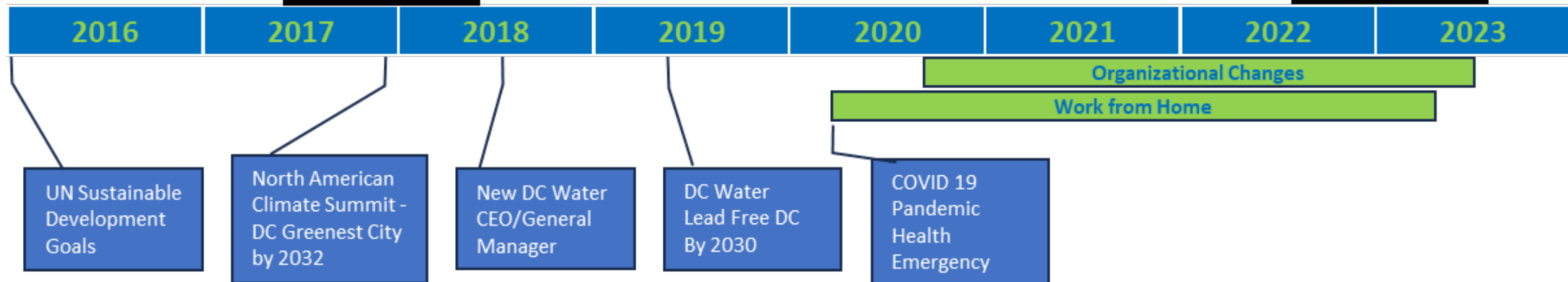
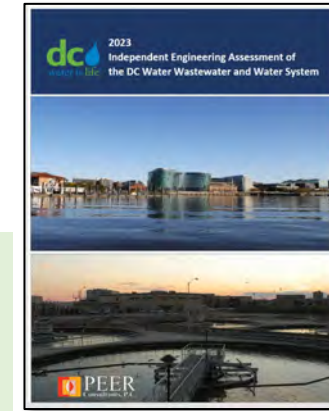
Introduction

Under its Master Indenture of Trust, DC Water requires an independent engineering assessment be prepared every five years



“Generally found all facilities to be operating at levels allowing DC Water to comply with permit requirements and to meet service commitments. The investigations and reports show the Authority to be diligent in its efforts to meet all challenges.”

“DC Water continues to comply with all permit and consent decree requirements. In almost all areas its performance is above average relative to its peers and in some areas, its performance is at or near best in class.”



Methodology

23 group interviews of over 3 dozen managers and attended Board Meetings



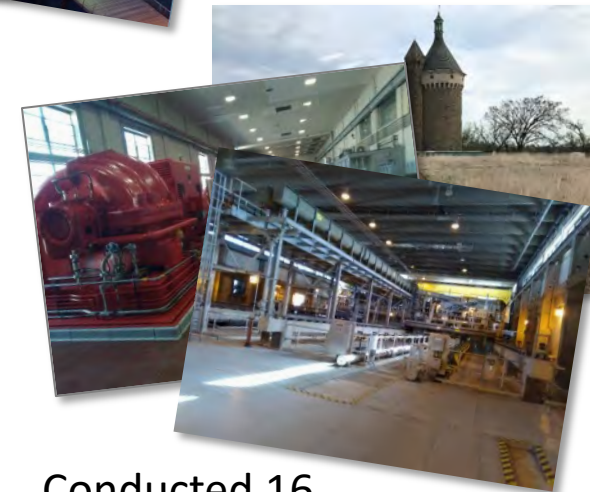
Tailored Questionnaires and Self Assessments



Reviewed over 50 documents and over 20 webpages



Metric and best practice analyses relative to comparable utilities



Conducted 16 30-factor site evaluations

2023 Independent Engineering Assessment of the DC Water Wastewater and Water System

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Future Considerations



A wooden water pump on the street in Washington, DC, in 1888.

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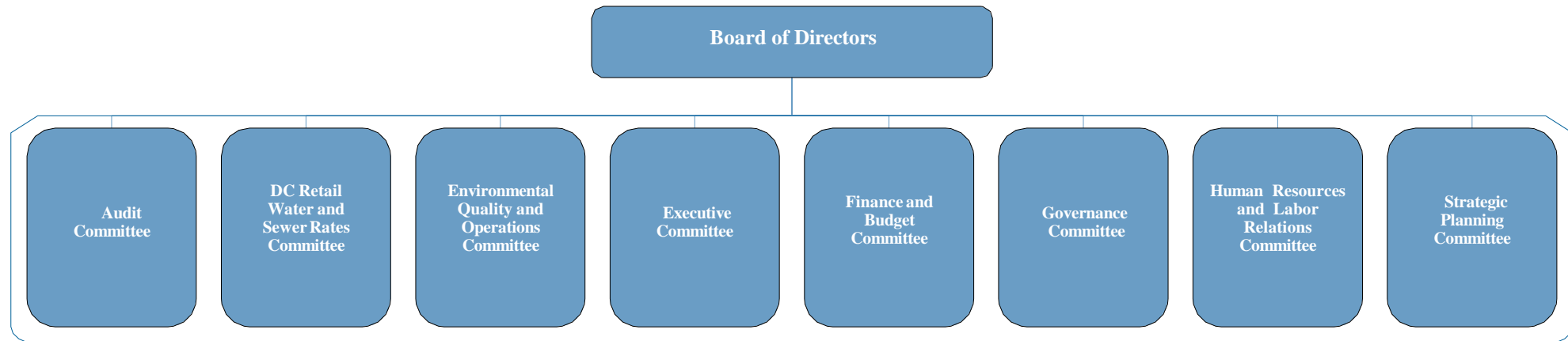
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Governance

DC Water's governance structure is more complicated than most utilities



Findings

✓ *DC Water enjoys **Best Practice Governance** and a well-deserved reputation for competent and astute oversight and management*

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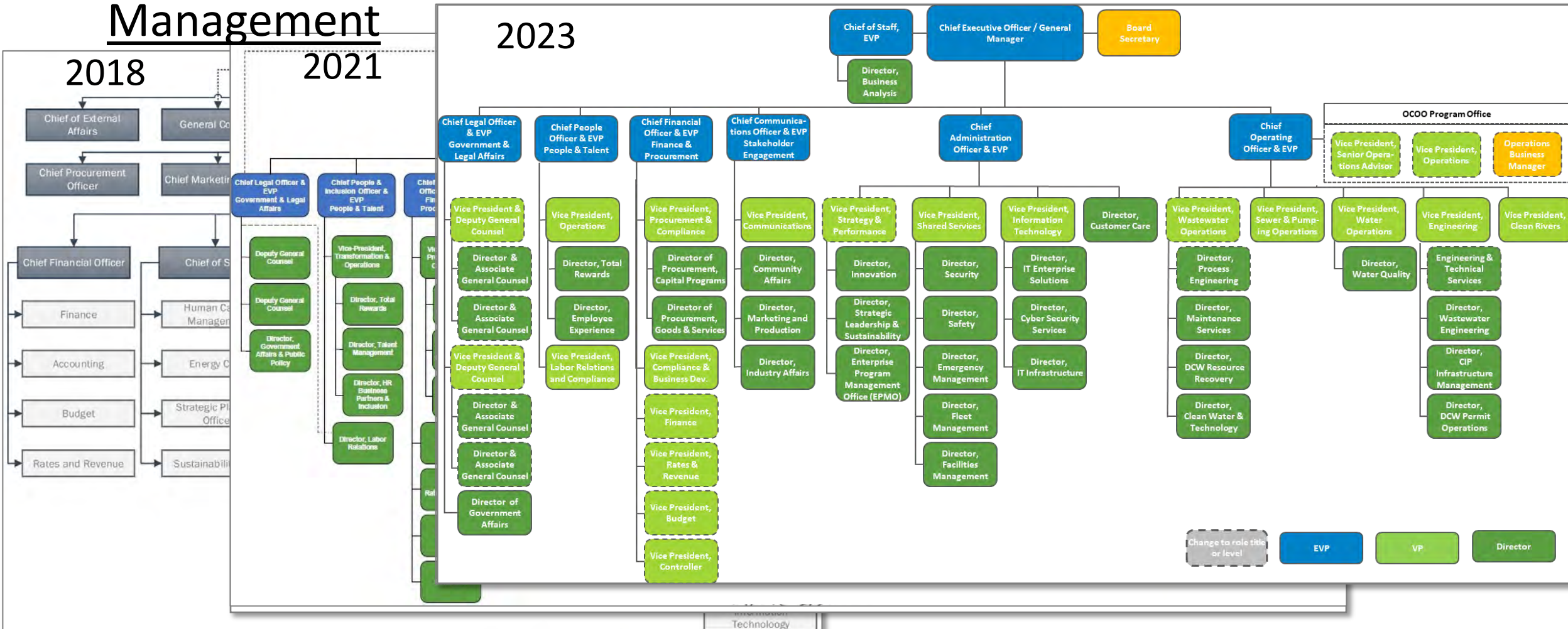
Future

Management

2018

2021

2023



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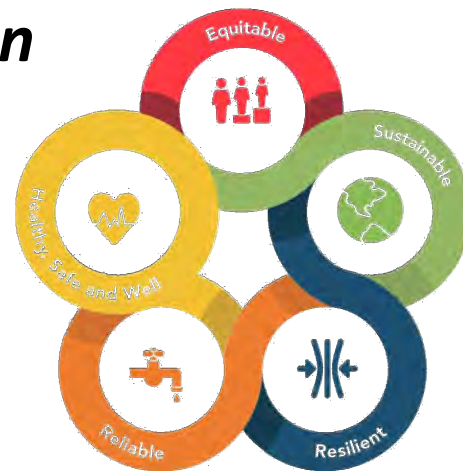
Future

Strategic Plan

Blueprint 2.0 (the 2022-2027 Strategic Plan) places DC Water on the path to becoming a strategy- and metrics-driven organization

Findings

✓ ***Blueprint 2.0 is a well-developed Best Practice strategic plan***



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Intergovernmental Relations

No other retail utility in the country must deal with the U.S. Congress and as many governmental agencies and advocacy groups as DC Water

Findings

✓ *DC Water does an excellent job interfacing with governmental entities and fostering those relationships*



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Recognition

DC Water is a visible expert in the water/wastewater industry

Findings

- ✓ *Recognized by peers as one of the better national and international utilities*
- ✓ *As association leaders, DC Water staff are shaping regulations and the industry*
- ✓ *Reputation as a high-quality innovator*



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Financial and Capital Improvement Plan

Ten-year budget and financial plan surpasses the five-year minimum requirement

Very capital intensive – total asset value vs. total revenue

Findings

- ✓ *High-quality bond ratings ensure lowest debt costs to finance the capital program*
- ✓ *The DC Water Budget document is a master class in transparency and thoroughness*
- ✓ *Highly competent finance and budget department inspires bondholder confidence*



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Workforce

Compared to other utilities, employees are older, better trained, and work in safer conditions

Findings

- ✓ *DC Water is a desired employer*
- ✓ *Currently addressing longer than average times to fill vacant positions*



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Information Technology

Migrated all on-premises processing, except for PCS and SCADA, to the Cloud

Findings

- ✓ ***DC Water's IT Department was fully prepared and supported the seamless transition to remote work during the COVID pandemic***
- ✓ All major systems replaced or updated, and continued upgrades are in progress



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Customer Service

DC Water prioritizes customer service

Performs extensive outreach to understand customer needs and wants

Findings

- ✓ *Provides above average levels of customer service*
- ✓ *Various types of customer feedback are used to continually improve*



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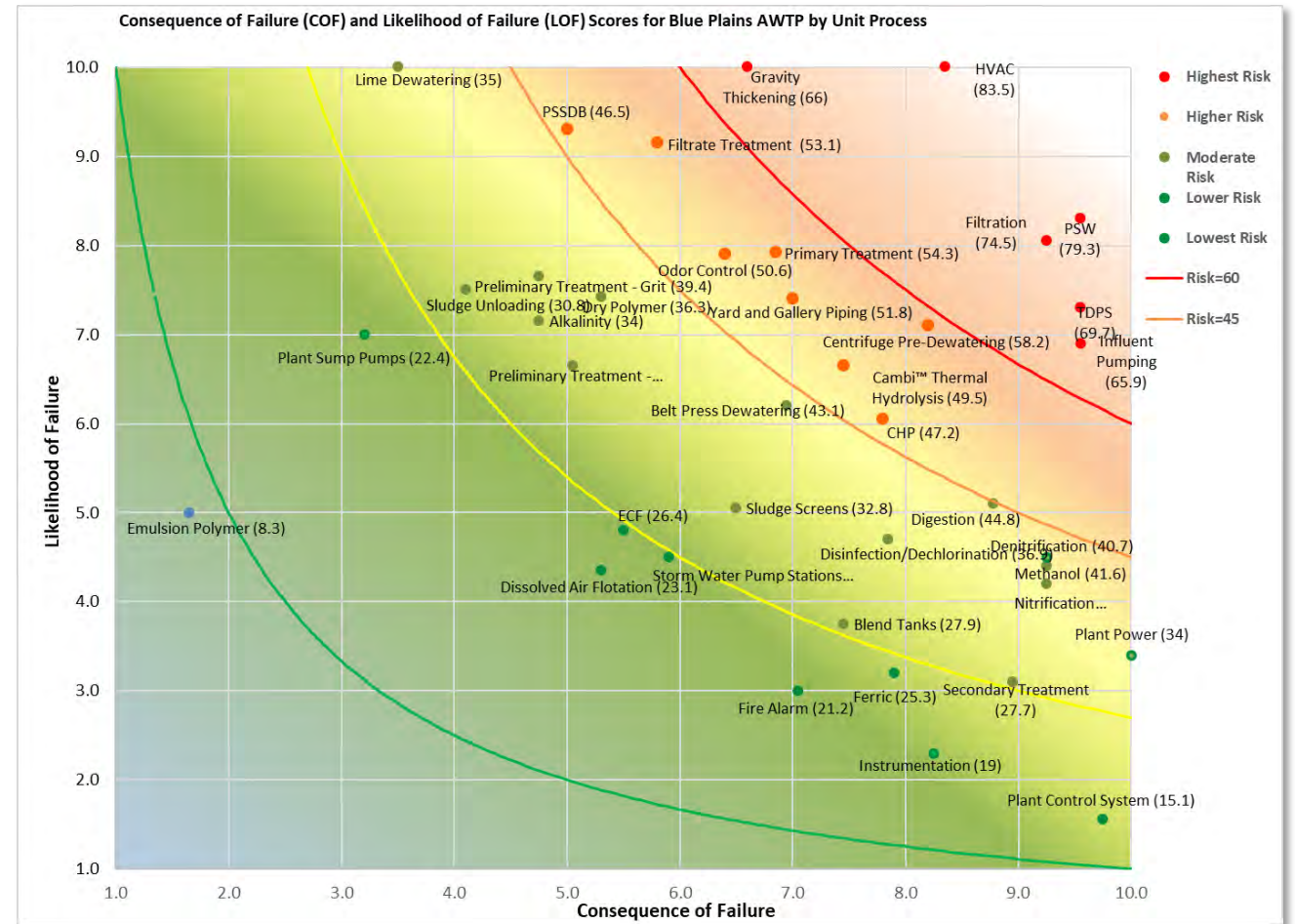
Future

Asset Management

DC Water is moving toward a “world class” asset management program

Findings

- ✓ *Transitioned from corrective to proactive maintenance*
- ✓ *Implemented a risk- and reliability-based asset management framework*



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Drinking Water System

Water source: Potomac River – Washington Aqueduct (USACE)

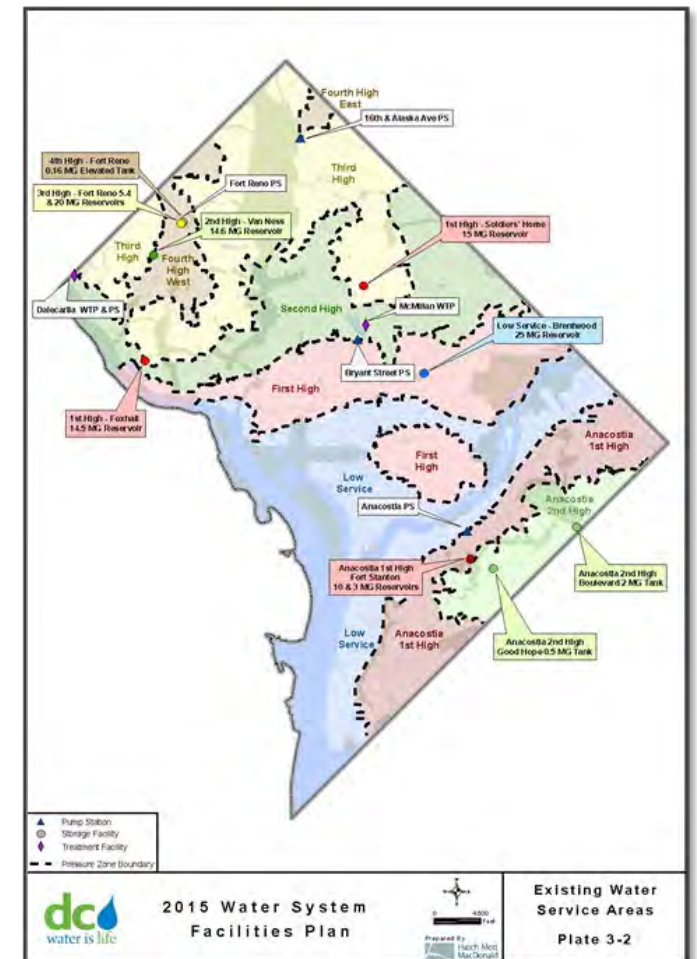
Drinking water system serves more than 700,000 residents, businesses, and the federal government

Conducts daily compliance monitoring and communicates with the Aqueduct so treatment adjustments can be made if indicated

Capital expenditures* last five years: \$283,232,897

Planned FY23-FY32 capital expenditures*: \$2,011,801,000

* Includes Lead Free DC expenditures



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Findings

- ✓ **100% drinking water compliance, and the relationship with the Aqueduct are best practices**
- ✓ **Committed to higher than federal standard water quality**
- ✓ **Relative to QualServe Utilities DC Water is:**
 - a top performer in available water supply and energy efficiency
 - above average in hydrant out of service and short-term water disruptions
 - **below average for greater than 4-hour disruptions**
- ✓ **Non-revenue water has increased to more than 30%**
- ✓ **DC Water's Planned Maintenance ratio is within Best Practice target range**



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Wastewater System

Retail service: District of Columbia

Wholesale services: adjacent MD and VA Counties

Blue Plains plant: 384 MGD annual average flows
up to four hours of 555 MGD wet weather flows

225 MGD from the Clean Rivers System receives
enhanced clarification treatment and up to 100 MGD
can be routed back to complete treatment

Capital expenditures last five years: \$515,232,391

Planned FY23-FY32 capital expenditures: \$2,976,997,000



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Findings

- ✓ ***Blue Plains is in full compliance with August 2018 NPDES permit***
- ✓ *Regular recipient of NACWA Performance Awards*
- ✓ *DC Water's self-assessment placed between competent and world class in all categories*



- ✓ *Relative to QualServe Utilities, scores highly in regulatory compliance, plant staffing efficiency, and maintenance*
- ✓ *Enhanced Nutrient Removal (ENR) and biosolids improvements at Blue Plains are well coordinated with the Total Nitrogen/Wet Weather Plan*

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Stormwater System

Municipal Separate Storm Sewer System (MS4) permit issued to DC Government

DC Water is responsible for combined sewer and sanitary sewer discharge points, but not for MS4 runoff

DC Water is designated lead for permit compliance coordination with Public Works and Health Depts.

Capital expenditures* last five years: \$10,784,000

Planned FY23-FY32 capital expenditures*: \$72,240,639

* Not including CSO & Clean Rivers project covered in the next section



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Findings

- ✓ *Consent Decree modified, allowing integration of the Combined Sewer Overflow – Long Term Control Plan and the Blue Plains Total Nitrogen/Wet Weather Plan*
- ✓ *In 2017, led the largest project in DC Water history for the Northeast Boundary Tunnel design/build*
- ✓ *The Clean Rivers Project has accomplished significant milestones including:*
 - *Lower portion of the Anacostia River Tunnel facilities commissioned by March 23, 2018*
 - *Anacostia River Tunnel system, including the Northeast Boundary Tunnel, is expected to be commissioned in Fall 2023, two years ahead of the consent decree date*



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Lead Free DC Project

Launched the Lead Free by 2030 Program in 2019

Updated estimates: 41,000 service lines to be replaced at a \$1.5B cost

Property owner owns the service line – DC Water maintains the public space portion

Replacement is optional – a mandate is under consideration

Capital expenditures* for the last five years: \$40,179,000

Planned for FY23-FY32 capital expenditures*: \$611,672,000



* This is the Lead Free DC portion of the Water System budget numbers.
Additional funds will be required for fully project completion by 2030

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Clean Rivers Project

2005 Consent Decree stipulates schedule and reporting

Under the COO and enhances public outreach and transparency

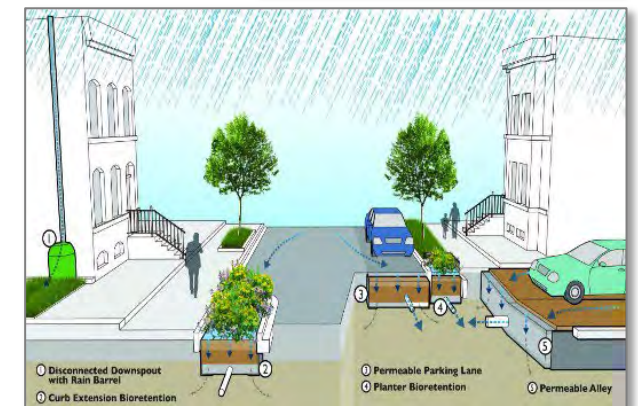
CSO-LTCP and TN/WW Plan linked to Chesapeake Bay Program

A 2016 Consent Decree amendment required a Green Infrastructure (GI) pilot and assessment; GI was determined impractical, so the Potomac Tunnel and a hybrid Rock Creek project were approved

Capital expenditures* last five years: \$870,982,463

Planned FY23-FY32* capital expenditures: \$1,062,874,000

* CSO plus Clean Rivers Program, which is expected to be completed during FY30



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Major Initiatives

Blue Drop

The nonprofit Limited Liability Company was created in 2016 to:

- support customer rate relief
- share knowledge, research, and expertise
- advance/promote of innovative strategies/technologies
- promote resource recovery and conservation



Blue Drop supports the following programs:



Net revenues from Blue Drop for FY22 were \$4M

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Findings

- ✓ *Employed common practice of creating short-term, special-purpose programs*
- ✓ *Clean Rivers has met schedule requirements and expects that to continue*
- ✓ *Hired experienced lead service line replacement team*
- ✓ *Three key factors to meeting Lead Free DC schedule:*
 - *Adequate funding*
 - *Property owner participation*
 - *Expedited permitting*
- ✓ *Blue Drop is a distinctive program that benefits ratepayers*
- ✓ *HQO event space rentals provides revenue while raising DC Water's visibility and creating a unique bond with its customers*



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Security Services

Safeguard and protect mission-critical resources and maintain a safe, welcoming customer focused workplace for staff and visitors

Comprehensive Emergency Management Plan was developed and implemented

Upgrading security at facilities system-wide since 2010

\$3.4M in additional capital projects scheduled through FY25

Cybersecurity

Critical plant systems (SCADA and PCS) run on-premises with remote backup

Remaining applications are cloud-based

Administrative, SCADA, and PCS networks are physically and logically separated



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Findings

- ✓ *Security Department exceeded Blueprint 2.0 performance measures*
- ✓ *All security metrics above the QualServe high performer median or in the top quartile*
- ✓ *Member of the U.S. Cybersecurity and Infrastructure Security Agency's (CISA) Water/Wastewater cyber taskforce*
- ✓ *Implemented all CISA Cybersecurity Performance goals*
- ✓ *Uses NIST's Cyber Security Framework as foundation of Cyber Resiliency program*



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Addressing Sustainability

A Bluepoint 2.0 Imperative

Working with DC Government to meet Clean Energy DC plan

Single largest DC user – over 431 GWh annually (85% at Blue Plains)

Adapting to the impact of climate variability and extremes:

- DC Water CEO co-chairs the DC Flood Task Force
- With the District and DC Council of Governments, monitors climate impacts
- Constructing Blue Plains Treatment Plant floodwall
- Planning for potential water shortages and temperature extremes
- Expanding design standards to a 500-year storm



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Addressing Sustainability

Energy Efficiency and Renewable Energy:

- Combined Heat and Power (CHP) facility, provides 1/3 of Blue Plains' electricity – saving \$10M/year
- Secondary Aeration System upgrade saved 4.5 GWh/year
- 12,000 new solar panels save nearly \$4M over 20 years
- 57.8% of Blue Plains energy use satisfied by renewable energy
- Phase II solar project – 11 MW of capacity
- Pursuing efficient building design and operation, modernized and renewable energy supply, electrification, and fuel switching



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Addressing Sustainability

Resource Recovery:

- Carbon produced and nutrients removed are assets
- \$2.2M research project funded to investigate 5 potential treatment systems that could offer substantial energy and resource recovery benefits

Resilience:

- America's Water Infrastructure Act requires risk and resilience assessments every 5 years
- Identify and prepare for threats by creating a library of regularly updated plans
- Planning based on vulnerability and risk assessments, and an "all hazards approach"
- One of the few utilities with a hazard mitigation plan and taskforce

DC Water FY22 ESG+R Report

We utilize waste as a resource to minimize our carbon footprint, increase revenue, reduce costs, and contribute to the circular economy.

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Customer Expectations, Awareness, Outreach, and Social Media

Extensive customer outreach – sizeable social media presence

Expanding customer engagement and crisis communications capabilities

Monitoring stakeholder preferences, other utilities' practices, and regional and national trends

As changes are identified, DC Water implements different outreach channels



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Employee Recruitment and Retention

Utility employees tend to be long tenured, therefore DC Water is performing succession planning

The tight pandemic impacted labor market is challenging

Different generations require different recruitment and retention strategies and tactics

Characteristics of desired employees are changing as are their expectations of employers

Broadening outreach for potential candidates



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Regulatory Requirements and Operating Conditions

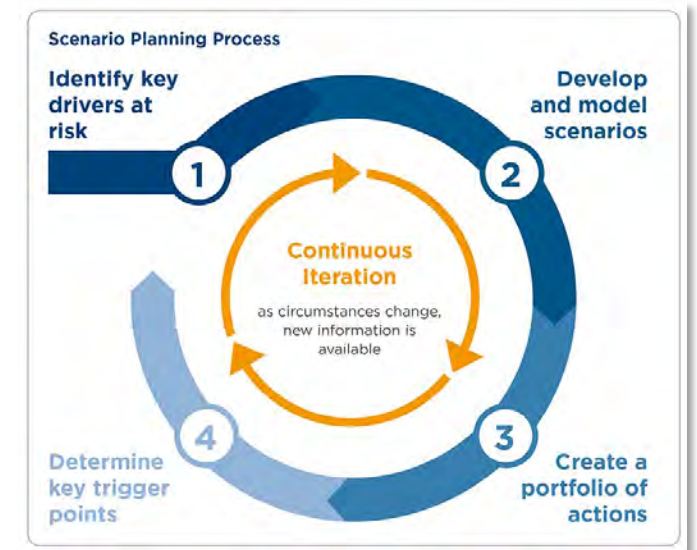
More stringent regulatory requirements and shifts in operating conditions add complexity, cost, and risks which are placing pressure on revenue needs

Biggest challenge is cost effectively meeting new regulations

Prepared for near term changes, but large, expensive regulations on horizon

Joining advisory committees, submitting testimony on proposed regulations, conducting pilot studies, and participating in Research Foundation studies

Utilizing scenario planning while incorporating sensitivity/vulnerability analysis



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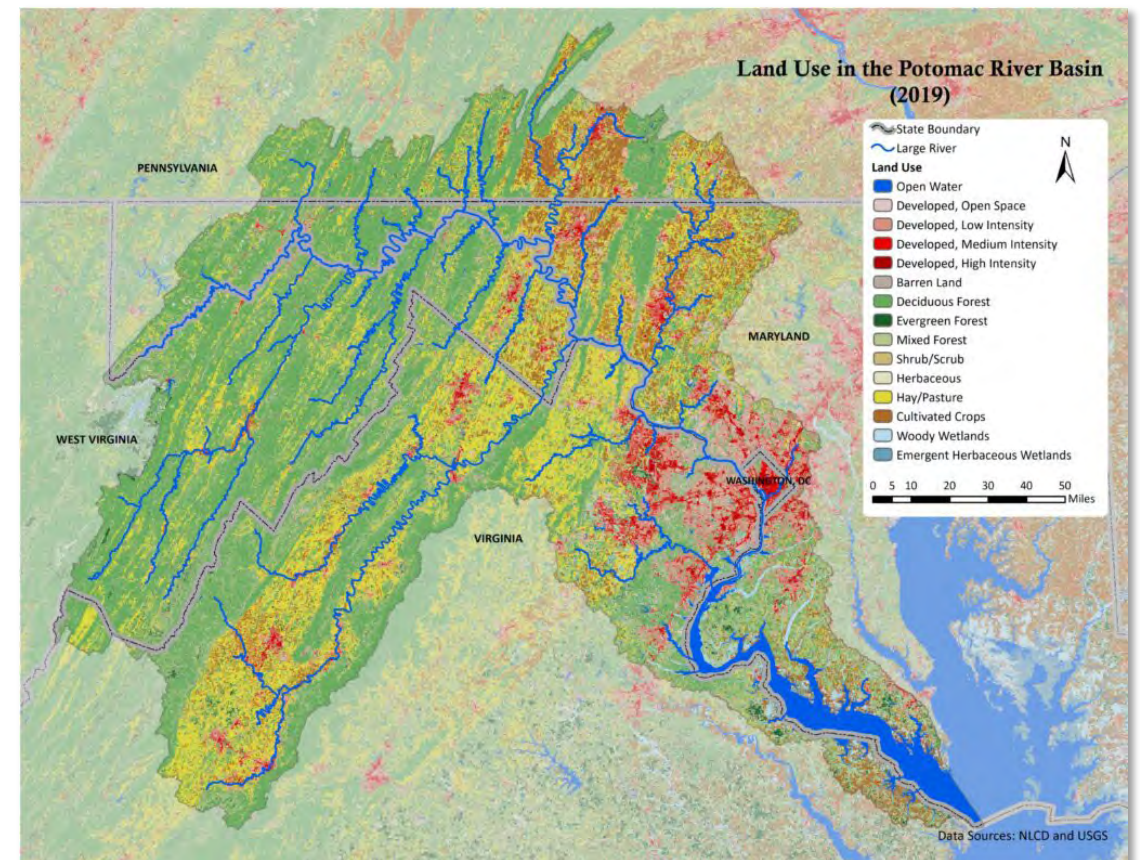
Watershed Management

Climate Change impacts watershed supply and demand

New regulatory requirements will effect watershed management

Potential of a second water source impacts multiple entities within the watershed

Watershed engagement requires continuous stakeholder interaction



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Automated and Smart Systems

Leading innovator in the water utility industry

DC Water is at the forefront of using automation and artificial intelligence (AI) to improve decision making:

- Pipe Sleuth
- Near real-time hydraulic modeling
- Predictive Main Break application prototype
- Water Quality Monitoring application



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Findings

- ✓ *Forward-looking organization – e.g., pre-COVID preparation for events requiring remote work*
- ✓ *In 2019, first utility to achieve ANSI EMAP 4-2016 Emergency Management Standard accreditation*
- ✓ *QualServe 2022 highest rating for:*
 - *Cybersecurity preparedness*
 - *Risk assessment and response preparedness*
 - *Recovery and mitigation*
 - *Emergency response planning*
- ✓ *Already preparing for next change or disruption*
 - *Stringent regulatory requirements*
 - *Grid disruptions*
 - *Increasing technological advances*
 - *Supply chain issues*
 - *Climate Change impacts*
 - *Workforce market fluctuations*



Summary of the Findings

Benchmarking and Self-Assessment Findings

Of the areas covered in the self-assessment for which we received responses, none were lower than competent, and many were close to world class. These tables merge the self-assessment with the QualServe Benchmark results to provide an overall view.



Wastewater	
Treatment Process	Near World Class
Sludge Treatment	Near World Class
Crisis Management	Competent
Health & Safety	Near World Class
Organization Development	Competent
Performance Management	Near World Class
Financial Responsibility	Near World Class
Materials Management	Competent
Documentation	Near World Class

Water	
Distribution System	Competent
Materials Management	Competent
Documentation	Competent

Asset Management and Capital Delivery	
Asset Knowledge	Highly Competent
Risk Management – Criticality	World Class
Risk Mgt. – Asset Condition	Near World Class
Plant Maintenance Organization	Near World Class
Plant Maintenance – Quality	World Class
Document Management	Near World Class
Inventory Management	Competent
Financial Accountability	Near World Class
CIP Production	Near World Class
Capital Delivery	Near World Class

Customer Service	
Call Center	Competent
Billing	Competent
Payment Options	Competent
Collections & Revenue Protection	Competent
Performance Mgt. & Training	Competent
Customer Satisfaction	Competent
Organizational Effectiveness	No Response

Utility Services	
CMMS	Competent
Work Order Management	Highly Competent
Mapping/GIS	Competent
Work Planning	Insufficient Data
Organization Development	Work Scheduling
Capacity & Demand Management	Insufficient Data
Work Order Execution	Insufficient Data
Special Programs	Insufficient Data
Review Of Process	Insufficient Data
Inventory & Materials Management	Insufficient Data
SOPs, O&M Manuals	Competent

RCM Performance	
Reliability Centered Maintenance	World Class
Performance Management	Near World Class
Organization	Highly Competent
Information Reporting	Near World Class
Continuous Improvement	Highly Competent
Direction & Leadership	Highly Competent

Summary of the Findings

Site Visit Findings

Up to 30 factors were rated on a scale of 1-10 for each site

The average ratings are shown in the table

Overall, this is indicative of a well-maintained physical plant

It is also an indirect reflection on the quality of historic capital programs

Quality assets are easier to keep in good physical condition

<i>Activity</i>	<i>Site</i>	<i>Average Score</i>
<i>Non-Process</i>	Headquarters Administration Building (HQO)	10
<i>Drinking Water</i>	Bryant Street Pumping Station	9.4
	Anacostia Pumping Station	9.3
	Fort Reno Reservoir	9.8
<i>Wastewater</i>	Blue Plains AWTP Control Center	10
	Blue Plains AWTP Preliminary Treatment	9.3
	Blue Plains AWTP Primary Treatment	9.3
	Blue Plains AWTP Secondary Treatment	9.5
	Blue Plains AWTP Advanced Treatment	9.5
	Blue Plains AWTP Solids Handling	9.0
	O Street Pumping Station	9.0
	Main Pumping Station	9.1
<i>Stormwater</i>	Blue Plains Treatment	10
	Blue Plains Tunnel	10
	Rock Creek Project B	9.8
	CSO 021 Diversion Facilities Projects	9.9

Key Recommendations

- Continue rollout of Blueprint 2.0, including a full suite of metrics to identify implementation success and achievement of reorganization goals
- Improve customer satisfaction by “incorporating feedback from customer satisfaction surveys,” “implementing customer survey and process improvements from survey results,” and working with IT to create a Maximo system and data applications for customer complaints
- Follow up high-level organizational improvements with opportunities at lower levels in the organization – for example, centralizing asset management to ensure better uniformity of maintenance and capital decisions
- Current performance management and metrics are centered primarily around the strategic plan and ESG – investigate other frameworks, such as Effective Utility Management (EUM)

Key Recommendations

- Given world-class utility ambitions, consider pursuing the Malcolm Baldrige National Quality Award®
- Pursue DC Water-identified opportunities for improvement, in particular:
 - Accelerating reduction of non-revenue water to peer utility average to mitigate rate increase pressures
 - Improve greater than 4-hour disruption of service rates to increase customer satisfaction
- Successful lead service line replacement programs are typically mandatory and often free to the property owner
- Include in scenario planning, the impact of more stringent PFAS regulations on the ability to sell biosolid products rather than incinerate or landfill
- Consider water supply resiliency – multiple sources and system redundancy

Questions & Discussion

