DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY
Board of Directors

Meeting of the
Environmental Quality and Operations Committee

5000 Overlook Avenue, SW, Room 407
Thursday, March 15, 2018
9:30 a.m.

BY EXCEPTION ONLY *

	I.	**Call to Order**	James Patteson Chairperson
9:30 a.m.	**II.**	**Path to Asset Management Work Plan**	Leonard Benson
***9:55 a.m.**	**III.**	**Clean Rivers Update Status**	Carlton Ray
10:05 a.m.	**IV.**	**Grand Opening of the Clean Rivers Tunnel System**	Carlton Ray
10:10 a.m.	**V.**	**Water Main History and Associated Cost**	Charles Kiely
10:20 a.m.	**VI.**	**Sewage Pumping Station Flood Protection Status**	Craig Fricke
10:30 a.m.	**VII.**	**Action Items**	Len Benson

Joint Use

1. Contract No.: DCFA #463 – AECOM Services of DC, Construction Management Services, Anacostia River Combined Sewer Overflow (CSO) Control Projects, Division Z – Popular Point Pumping Station Replacement and Main Outfall Sewers Diversion
2. Contract No.: DCFA #425 – HDR, Inc., Grit, Screens, and Primary Facilities Upgrades

Non Joint Use

1. Contract No. 150220 – Fort Myer Construction Corporation, Division PR-A1-Potomac River Project A1 (GI)

***10:40 a.m.**	**VIII.**	**AWTP Status Updates**	Aklile Tesfaye

1. BPAWTP Performance

***10:45 a.m.**	**IX.**	**Water Quality Monitoring**	Charles Kiely

1. Coliform Testing
2. LCR Compliance Testing

***10:50 a.m.**	**X.**	**Fire Hydrant Upgrade Program**	Jason Hughes
		1. Status Report of Public Fire Hydrants **2.** Out of Service Fire Hydrant Map	
10:55 a.m.	**XI.**	**Executive Session***	
11:00 a.m.	**XII.**	**Adjournment**	James Patteson Chairperson

* The DC Water Board of Directors may go into executive session at this meeting pursuant to the District of Columbia Open Meetings Act of 2010, if such action is approved by a majority vote of the Board members who constitute a quorum to discuss: matters prohibited from public disclosure pursuant to a court order or law under D.C. Official Code § 2-575(b)(1); contract negotiations under D.C. Official Code § 2-575(b)(1); legal, confidential or privileged matters under D.C. Official Code § 2-575(b)(4); collective bargaining negotiations under D.C. Official Code § 2-575(b)(5); facility security under D.C. Official Code § 2-575(b)(8); disciplinary matters under D.C. Official Code § 2-575(b)(9); personnel matters under D.C. Official Code § 2- 575(b)(10); proprietary matters under D.C. Official Code § 2-575(b)(11); decision in an adjudication action under D.C. Official Code § 2-575(b)(13); civil or criminal matters where disclosure to the public may harm the investigation under D.C. Official Code § 2-575(b)(14), and other matters provided in the Act.

Follow-up Items from Prior Meetings:

1. Manager, Program Services: Provide updates regarding change order rates and general contract management performance as part of the next CIP quarterly update. **[To be included in the CIP Quarterly Update, May 2018]**
2. AGM, Wastewater Treatment, DC Water: Provide update of research activities regarding trends and technologies that optimize treatment process capacity and facilitate energy neutral operations**. [Target: April 2018 EQ&Ops Cmte Mtg]**
3. The IMA Regional Committee (RC) brief the EQ & Ops Cmte on the work of the IMA RC **[Target: June 2018 EQ&Ops Cmte Mtg**]
4. Chief Financial Officer, DC Water: Include a definition for "Customer Affordability" as part of the discussion on Path to Achieve Asset Management. **[Ongoing]**
5. Interim General Manager / CEO, DC Water: Provide the Committee with DC Water testimony prepared for DC Council's Oversight hearing on March 2, 2018. **[BOD Secretary distributed to full Board, 2/28/18]**
6. Interim General Manager / CEO, DC Water: Will provide the BOD with DC Water response to DOEE Public Notice of proposal to change WQS. **[BOD Secretary distributed to full Board, 2/21/18]**
7. Chief Engineer, DC Water: Will brief the Cmte regarding certain Engineering SOP pertinent to recommendations for contract award and projection of CIP cashflow. **[Target: May 2018 EQ&Ops Cmte Mtg]**
8. Chief Engineer, DC Water: Provide update on flood vulnerability and protection of other critical DC Water facilities. **[On current agenda]**
9. Assistant General Manager, Customer Service: Provide water main break data over the past 10 years. **[On current agenda]**

Path to Achieve Asset Management

District of Columbia Water And Sewer Authority

Environmental Quality & Operations Committee Meeting
March 15, 2018

Path to Achieve Asset Management

- Collaborative effort by Residents and Ratepayers, the Board of Directors, and the Executive Team
  - Explore investment in infrastructure
    - What is needed to fully meet asset management principles?
    - What are our peer utilities doing?
    - What is the cost of pro-active investment, as compared with addressing issues as they arise?
  - Exploration of alternative revenue sources
    - What funds could be available, other than from ratepayers?
  - Community outreach and education
    - Explain infrastructure investment, and consequences of investment
    - Gather ideas about addressing affordability
  - Impact on the financial plan
    - What is the impact on the operating budget, and what is the impact of pro-active investment as compared with addressing issues as they arise?
    - What could be financed through debt?
    - What are appropriate levels of PAYGO?
  - Customer affordability
    - What ways can we help ensure affordability?
    - What are our peer utilities doing to meet this challenge?

Committee Assignments

Path to Achieve Asset Management	Committee Assignments
Explore investment in infrastructure	Environmental Quality and Operations Committee
Exploration of alternative revenue sources	Finance and Budget Committee
Community outreach and education	Retail Rates Committee
Impact on the financial plan	Finance and Budget Committee
Customer affordability	Retail Rates Committee

- Committee reviews/discussions are intended to ensure optimization, accountability and transparency throughout the budget preparation process

BOD Discussion and Action
Capital Improvement Program (CIP) FY' 18 thru FY' 27

- January 4, 2018 – Full Board Budget Workshop
- January 2018 – Committee Meetings
  - EQ & Ops Committee
  - Retail Rates Committee
  - Finance and Budget Committee
- February 2018 – Committee Meetings
  - EQ & Ops Committee
  - Retail Rates Committee
  - Finance and Budget Committee
- March 1, 2018 – Full Board Meeting
  - Approved Baseline FY 2018 – FY 2027
  - Committed to a "Pathway to Asset Management"
- March – September
  - Committee Reviews
- November
  - Budget presented to the Board

EQ & Ops Committee Proposed Work Plan

- April - What are peer utilities experiencing?
  - Age of system
  - Materials and design
  - Service life
  - Infrastructure failure experience
  - Infrastructure investment approach
- April, May & June – What is needed to fully meet asset management principles?
  - Current state of repair
  - Site visits

Explore Investment in Infrastructure

1. **What is needed to fully meet asset management principles?**
2. What are our peer utilities doing?
3. **What is the cost of pro-active investment vs. addressing issues as they arise.**

EQ & Ops Committee Proposed Work Plan

- June – What is the cost of pro-active investment vs. addressing issues as they arise?
  - Cost of emergency repairs
    - Direct costs
    - Indirect costs
    - Socioeconomic costs
  - Other impacts
    - Continued failures, breaks, backups, etc
    - Water quality and discolored water
    - Continually adjusting priorities & changing plans
    - Capitalization of emergency repairs
    - Risk of SSO Consent Decree
    - Safety
    - Socioeconomic impacts
  - Examples

Explore Investment in Infrastructure

1. What is needed to fully meet asset management principles?
2. What are our peer utilities doing?
3. **What is the cost of pro-active investment vs. addressing issues as they arise?**

EQ & Ops Committee Proposed Work Plan

- July - What is needed to fully meet asset management principles?
  - Review of previously presented scenarios
  - Alternative ramp up scenarios
  - Tours and site visits

Explore Investment in Infrastructure

1. **<u>What is needed to fully meet asset management principles?</u>**
2. What are our peer utilities doing?
3. What is the cost of pro-active investment vs. addressing issues as they arise?

District of Columbia Water and Sewer Authority
Henderson J. Brown, IV, Interim CEO and General Manager

Briefing on:

DC Clean Rivers Project Quarterly Update

Briefing for:

Environmental Quality & Operations Committee Meeting

March 15, 2017

DCWATER.COM

Agenda

- Overview
- Progress Summary – March 2018 Consent Decree
- Progress Summary – Remaining Projects

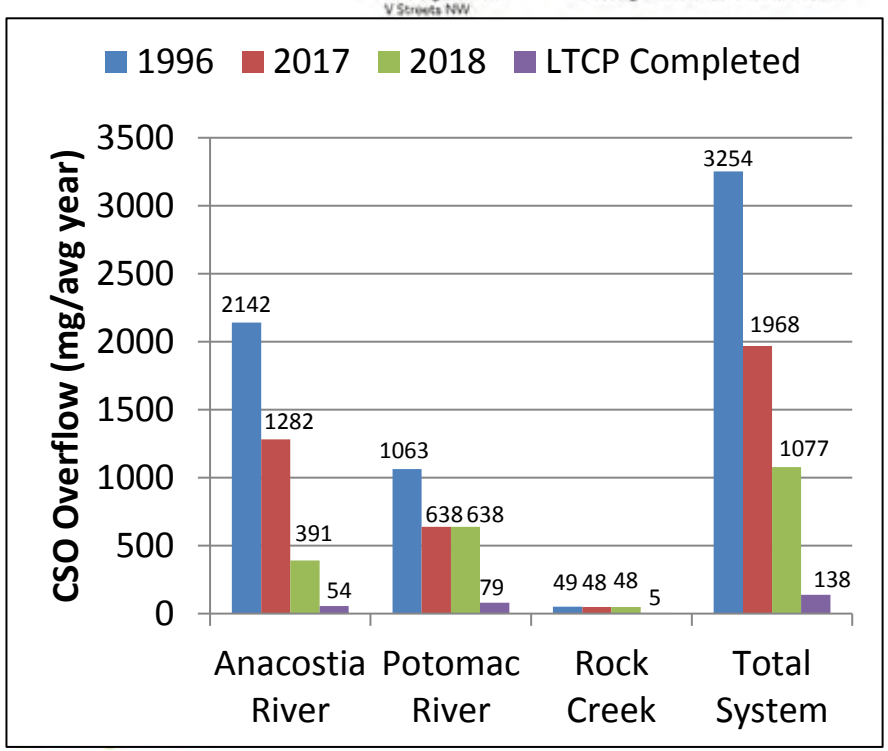
DC Clean Rivers Project Overview

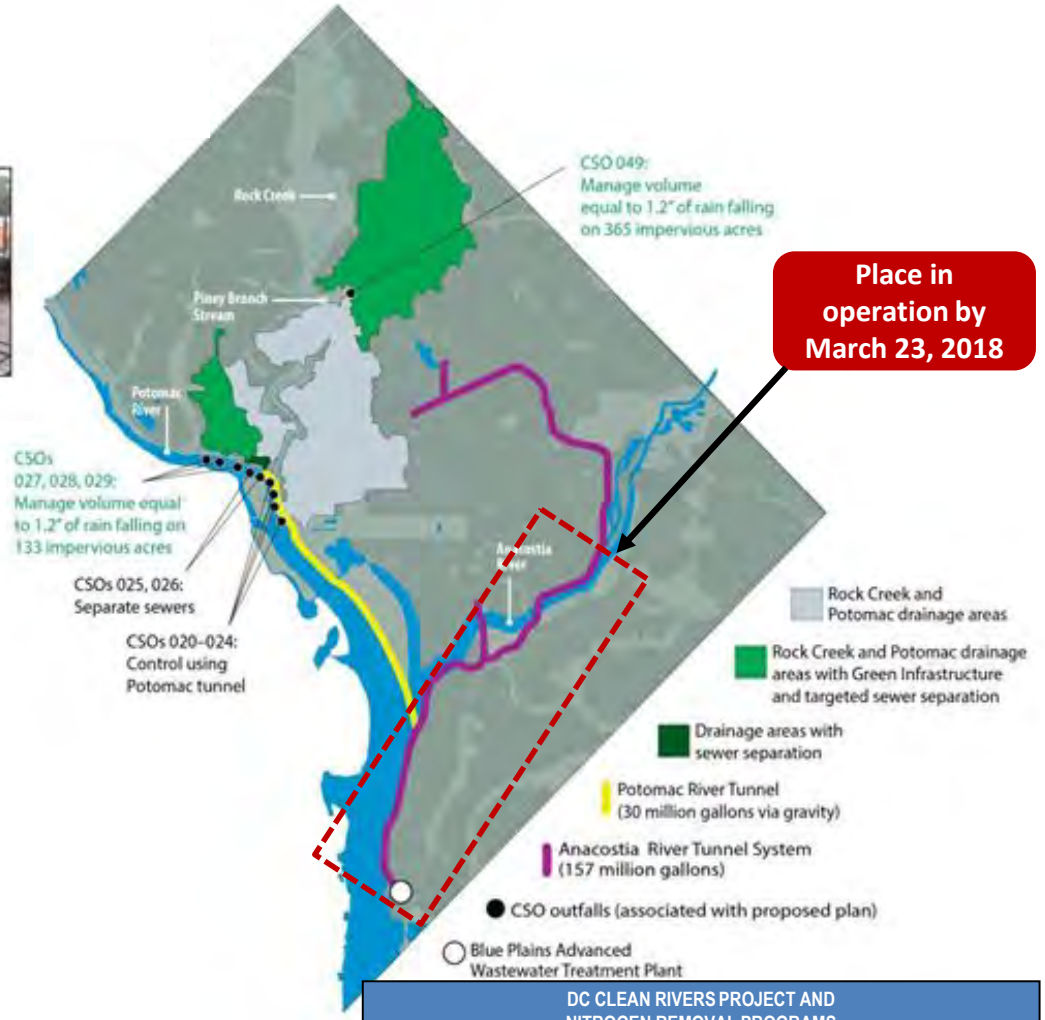
Controls Combined Sewer Overflows

Addresses Chronic Sewer Flooding

▲ Flooding at 1st and V Streets NW

▲ Flooding at 1st and Rhode Island Ave NW





DC CLEAN RIVERS PROJECT AND NITROGEN REMOVAL PROGRAMS

- DC Clean Rivers Project: $2.7 Billion
- Nitrogen Removal: $950 Million
- Total > $ 3.5 Billion
- 25 yr implementation (2005 – 2030)
- 96% reduction in CSOs & flood relief in Northeast Boundary
- Approx 1 million lbs/yr nitrogen reduction predicted

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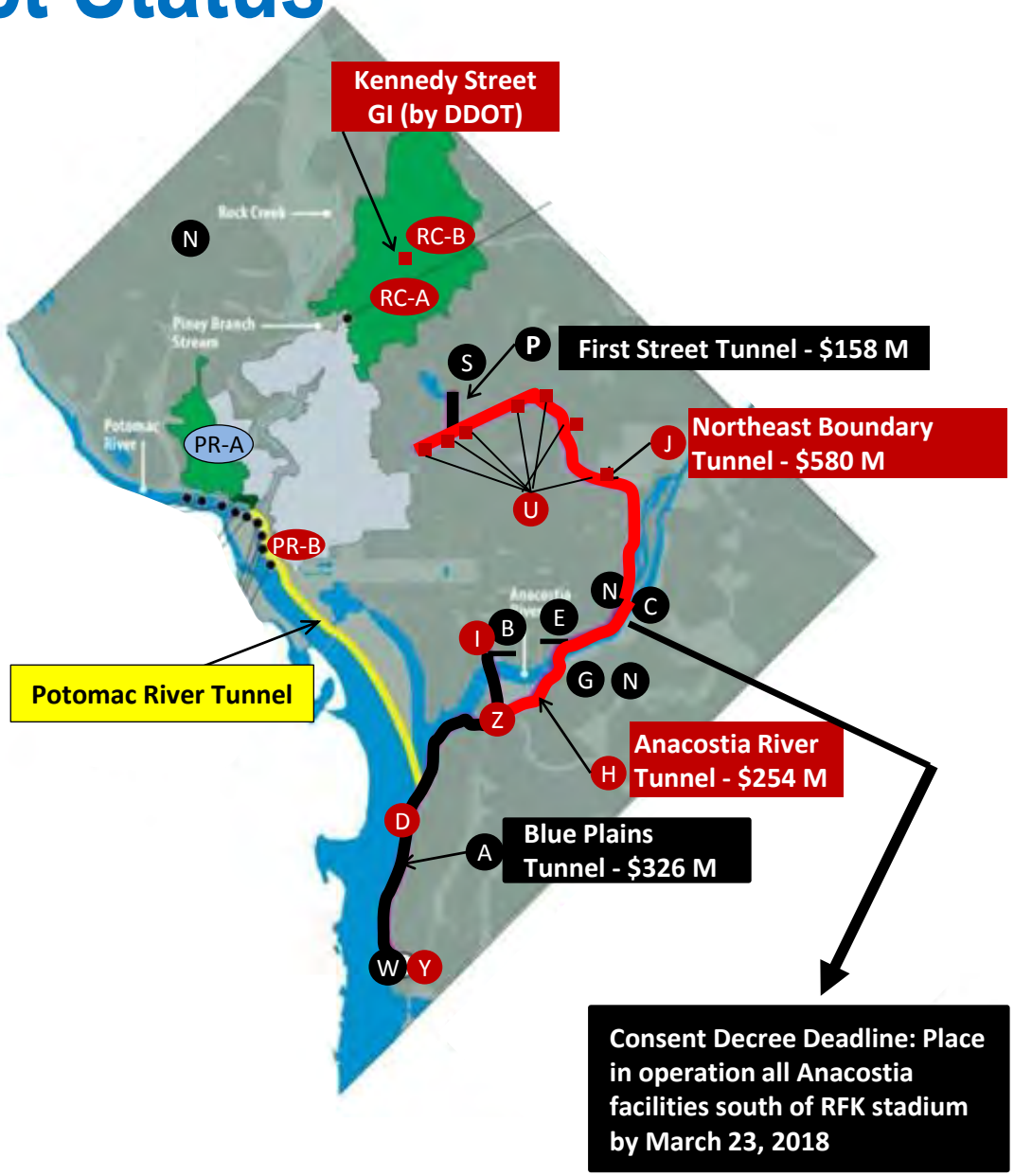
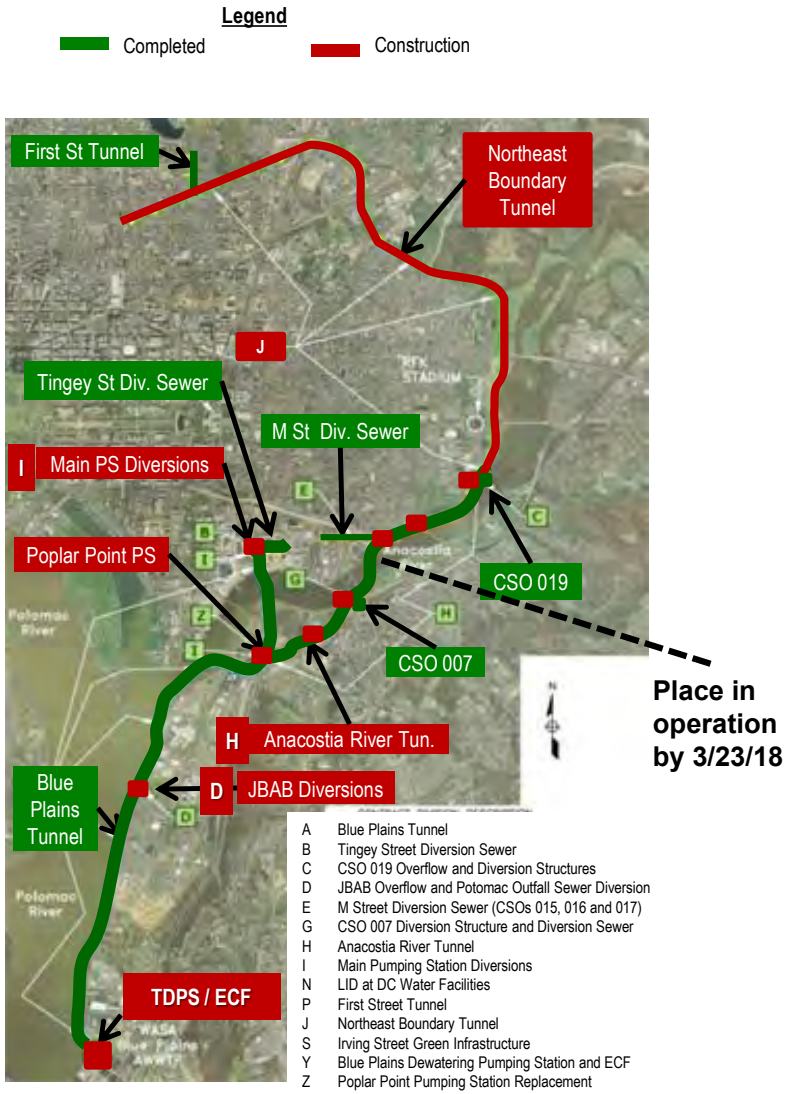
Clean Rivers Project Status

Division	Name
Completed Projects	
W	Blue Plains Tunnel Site Prep
A	Blue Plains Tunnel
C	CSO 019 Overflow and Diversions
B	Tingey Street Diversions
E	M Street Diversion Sewer
G	CSO 007 Diversion Facilities
N	Low Impact Development @ DC Water Facilities
P	First Street Tunnel
S	Irving Street Green Infrastructure
Projects in Construction	
H	Anacostia River Tunnel
D	JBAB Overflow & Diversion Facilities
I	Main Pumping Station Diversions
U	Northeast Boundary Utility Relocations
Z	Poplar Point Pumping Station & MOS Diversion
Y	Blue Plains Tunnel Dewatering Pumping Station and Enhanced Clarification Facility (Managed by DWE)
PR-B	CSO 021 Diversions at Kennedy Center
RC-A	Rock Creek Green Infrastructure Project A
RC-B	Kennedy Street Green Infrastructure (by DDOT)
J	Notheast Boundary Tunnel
Projects in Procurement	
PR-A	Potomac River GI Project A
Projects in Planning	
--	Potomac Tunnel EA



Anacostia River Tunnel System South of RFK
Place in operation by March 23, 2018

- All Anacostia CSOs will be intercepted by the 2018 tunnel system (CSOs 005, 007, 009, 010, 011, 011a, 012, 013, 014, 015, 016, 017, 018 and 019)
- Ultimate volume of Anacostia River tunnel system in 2023 (from Blue Plains to Northeast area of the District) is about 190 million gallons
- Volume provided in 2018 (Blue Plains to RFK) is more than 100 million gallons



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PROGRESS SUMMARY

MAJOR ACCOMPLISHMENTS FY 2017 4TH QUARTER UPDATE FOR MARCH 2018 CONSENT DECREE

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Division D – JBAB Overflow and Diversion Structures Status


Key Map

Complete:


Overflow Structure
Veneer Stone Wall


Tide Gate in Overflow Structure

Remaining:

- Drop shaft cover waterproofing and backfill
- Architectural finishes
- Electrical and instrumentation fit-out
- Startup and testing – at JBAB and remainder of tunnel sites

➡ **Substantial completion achieved in February 2018**

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Division H – Anacostia River Tunnel Project Status

Complete:

Remaining:

- Electrical and instrumentation hookups
- Startup and testing
- Removal of temporary bulkheads

➡ **Substantial completion achieved in February 2018**

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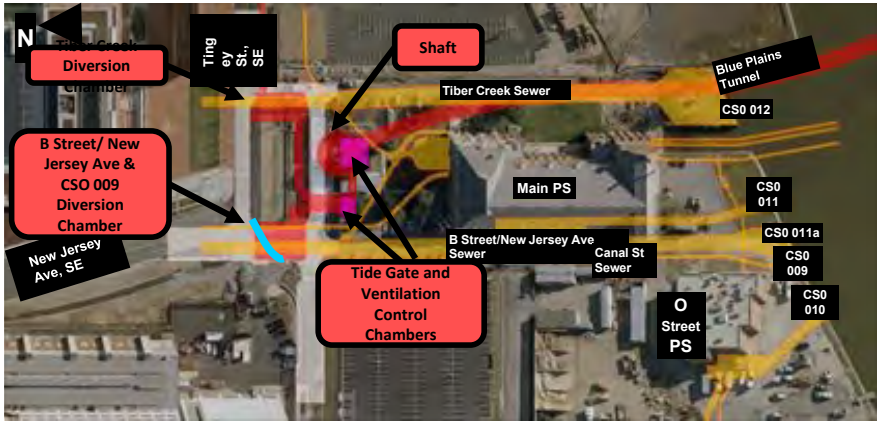
Division I – Main Pumping Station Diversions Project Status

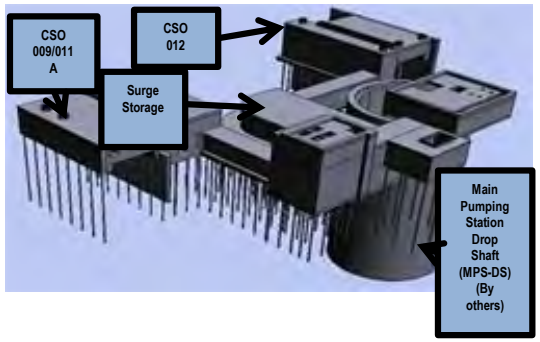

Key Map

Complete:




Ventilation Control Facility


Surge Tank / Conjunction Chamber Facade



Remaining:

- Electrical and instrumentation fit-out
- Startup and testing
- Punch list

➡ **Substantial completion achieved on February 15, 2018**

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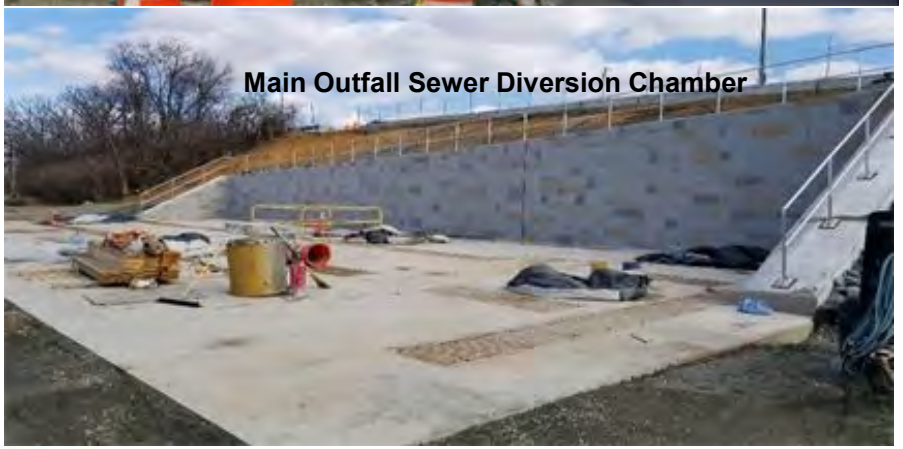
Division Z – Poplar Point Pumping Station Status


Key Map


Poplar Point Pump Station Building Facade


Main Outfall Sewer Diversion Chamber


Pump Room


Odor Control Equipment

- Start of Operational Demonstration occurred on February 13, 2018
- Consent Decree obligations can be met after sufficient operation has been performed in core function (pumping sewage) to demonstrate facility operation

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AECOM Construction Management Contract

Budget

Item	Value	
Original Contract Value	$ 4,891,074.00	
Supplemental Agreement #1	$ 1,992,719.57	DC Water Board in May 2017
Subtotal	$ 6,883,793.57	
Proposed Supplemental Agreement #2	$ 740,000.00	
Total	$ 7,623,793.57	14% of construction cost

Time

Item	Value
Notice to Proceed	Oct 22, 2014
Original Duration	958 days
Supplemental Agreements #1 + #2	549 days
Final Completion	Dec 31, 2018

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Rationale for Supplemental Agreement #2

- AECOM has performed well to date
- Value of supplemental agreement is based on:
  - Time for construction contractor to compete project
  - Estimate of staff required to address outstanding construction work, punch list, startup and closeout activities
  - Staff will be reduced as the project slows down
- Less expensive to keep CM on board than to address in another manner
  - Would lose historical knowledge
  - Would take time to get someone else up to speed

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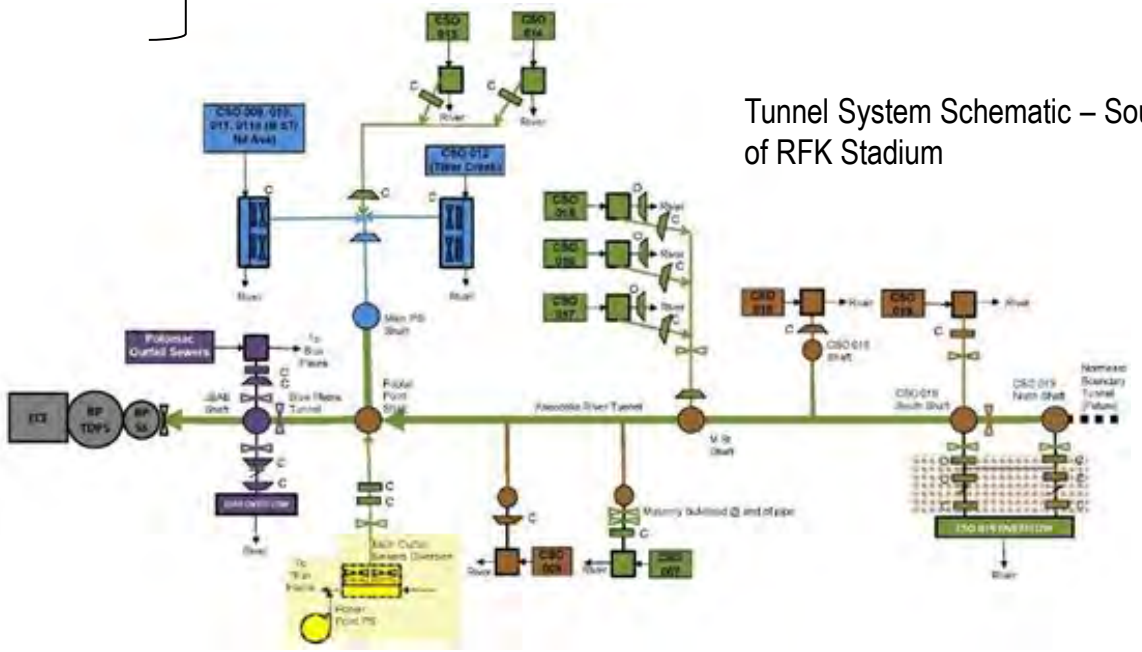
Anacostia River Tunnel Commissioning Awareness

- Consent Decree: System south of RFK must be placed in operation by March 23, 2018
- Plan for how to accomplish is included in each of the existing contractor's work requirements (all Divisions)
- Follow up global commissioning awareness meeting held January 12, 2018
- Monthly coordination meetings between contractors with interfaces
- Important because of interconnections in system
- All ART System Project CSO Controls are active (starting from February 28, 2018)

Be ready to receive flow March 23, 2018

- **Attended by multiple DC Water Departments, contractors, CMs and engineers**
- **Make sure plan is coordinated – get everyone on the same page**
- **Address safety**
- **Address contractor interfaces and scheduling**
- **Identify issues, areas for improvements**



Tunnel System Schematic – South of RFK Stadium

PROGRESS SUMMARY

MAJOR ACCOMPLISHMENTS FY 2017 4TH QUARTER UPDATE FOR REMAINING PROJECTS

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Division U – Northeast Boundary Tunnel Utility Relocations


Key Map

Contractor: Fort Myer Construction Corporation
Contract Price: $16.99M - Percent Complete: 96%
Financials as of February 1, 2018

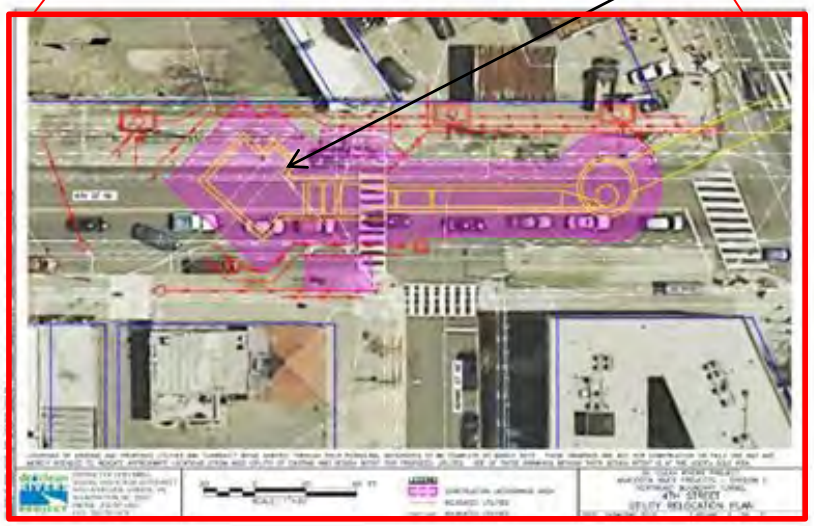
Purpose: Clear surface work sites to make way for NEBT Tunnel Contractor

- Contractor achieved Substantial Completion on November 27, 2017
- Remaining work includes punch list items, Pepco, WG, Verizon, and some weather dependent activities such as paving
- Project completed under budget


Restoration work at 6th Street


Ultrasonic Thickness Testing on 48" Water main

Zone to be cleared of utilities



Example: 4th & Rhode Island Ave NE

Division J – Northeast Boundary Tunnel


Key Map

Design-Builder: Salini Impregilo Healy JV
Contract Price: $580M - Percent Complete: 3%
Financials as of February 1, 2018

- Commissioned Tunnel Boring Machine on 1/23/2018
- Approved major Design Packages including CSO 019 Final TBM Breakout, W St. Final MOT and Temp Site Work, Mt. Olivet Rd 60% SOE
- Approved CSO 019 60% Force Main Relocation Maintenance of Flow
- Mobilizing to CSO 019 site on 3/5/18
- Mobilizing to Mt Olivet site on 3/14/18
- Mobilizing to W St. site on 4/20/18
- TBM arrival expected on 4/16/18

Milestone	Date
NTP	September 15, 2017
Construction Start	March 2018
Construction Complete	August 2023

Division PR-B – CSO 021 Diversion Facilities (Kennedy Center)


Key Map

Design-Builder: Davis Construction
Contract Price: $33.95M - Percent Complete: 83%
Financials as of February 1, 2018

Clean Rivers - CSO 021 Diversion Facilities

DC Water under contract with Davis Construction

Structure will intercept flows from CSO 021 and redirect them to future Potomac River Tunnel during wet weather

- Completed construction of ~75% of Diversion Chamber
- Drop/Vent structure ~ 80% complete
- Ventilation Control Facility (VCF) ~ 80% complete

Regular coordination on a tight construction site

Kennedy Center for the Performing Arts (KCPA) Expansion

Kennedy Center is proceeding with Whiting Turner to complete the project

Rehearsal space, parking garage, pavilions, reflecting pool and other enhancements constructed by KCPA

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Division RC-A – Rock Creek GI Project A

Key Map

Design-Builder: Anchor Construction
Contract Price: $27M - Percent Complete: 25%
Financials as of February 1, 2018

- Project facilities are being designed, permitted, and constructed in three phases:
  - Phases 1/1A and 2: Design and permitting complete; construction underway
  - Phase 3: Design and permitting underway; alley permeable pavement construction underway
- Construction started in September 2017
- Construction progress
  - Phase 1 – 80% complete
  - Phase 1A – 50% complete
  - Phase 2 – 25% complete
  - Phase 3 – 12% complete
- Functional testing of completed facilities started in October 2017
- Project scheduled to be placed in operation by March 30, 2019

Project Boundary:

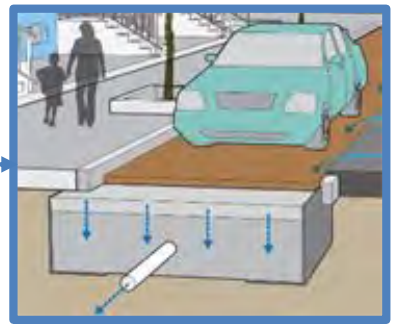
18

Division PR-A – Potomac River Project A

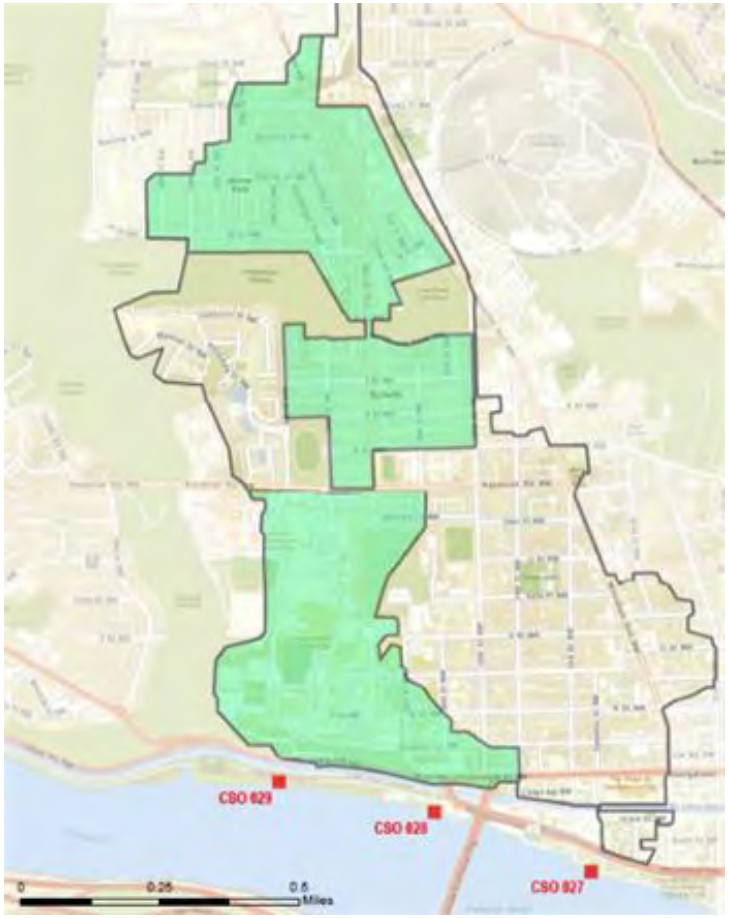

Key Map

Item	Status
Contract Award	April 9, 2018
Construction NTP	April 30, 2018
Place in Operation	CD Deadline June 23, 2019

- **Procurement underway**
- **Project includes:**
  - Planter Bioretention
  - Alley Permeable Pavement
  - Parking Lane Permeable Pavement



Project Boundary:



Division PR-A – Potomac River Project A Bids, Recommendation, and Next Steps

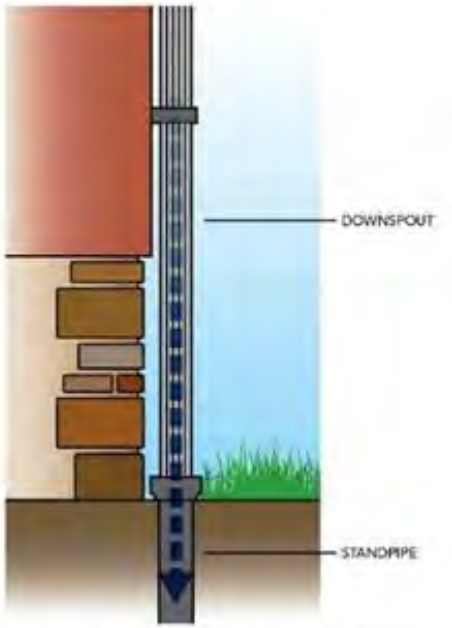
- Bids received on February 14, 2018 included:
  - Anchor Construction Corporation $8,984,628.00
  - Corman Kokosing Construction Company $10,010,290.00
  - Fort Myer Construction Corporation $6,265,502.47
  - Engineer's Estimate $7,763,663.46
- It is recommended that Fort Myer Construction Corporation be awarded the Division PR-A1 Construction Contract in the amount of $6,265,502.47
- Next steps:

Event	Date
EQ & Ops Committee	March 15, 2018
Board of Directors Meeting	April 5, 2018
Contract Award	April 9, 2018
Notice to Proceed	April 30, 2018

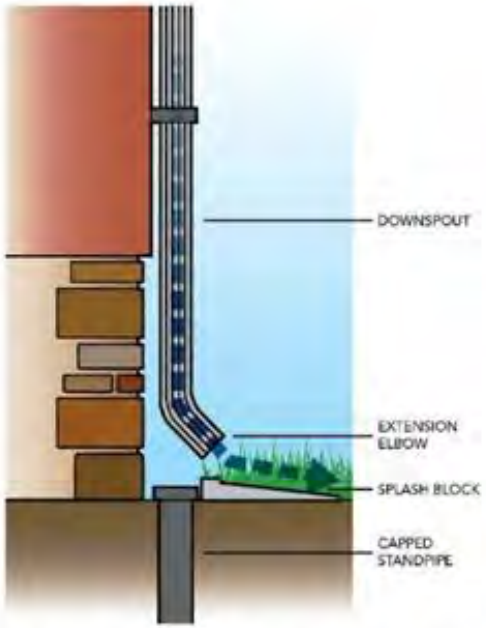
Drain the Rain! Rock Creek and Potomac Green Infrastructure Project Areas


Key Map

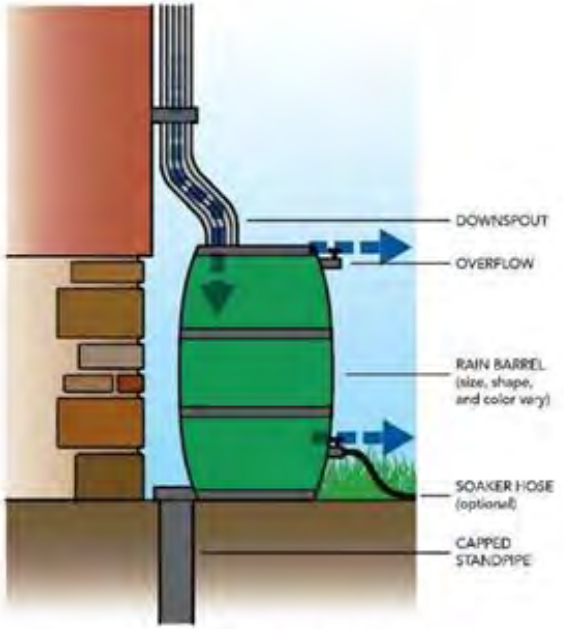
- **Voluntary, Free Downspout Disconnection Program with Rain Barrels**
  - Contracted with Rock Creek Conservancy
  - Pilot implementation completed - Over 120 downspout disconnections completed to date
  - Canvassing and installations to begin in additional



DOWNSPOUT CONNECTED TO SEWER SYSTEM



DOWNSPOUT DISCONNECTED FROM SEWER SYSTEM



DOWNSPOUT CONNECTED TO RAIN BARREL

Kennedy Street GI Challenge Streetscape Project


Key Map

- **Kennedy Street Green Infrastructure Streetscape Project**
  - Being constructed and managed with District Department of Transportation's (DDOT) Kennedy Street Improvements Project
  - Construction of GI is underway and DDOT anticipates completion in Spring 2018.

Groundbreaking – October 21, 2016

DDOT – Kennedy Street NW Improvement
(Georgia Avenue – New Hampshire Avenue NW)

DC Water GI Challenge Streetscape
(100 Block Kennedy Street NW)

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Green Jobs MOA: GI Certification Program

- Status:
  - Training:
    - Three rounds of training completed Fall 2016, Spring 2017, and Fall 2017
    - Next DC training to be held beginning in April 2018
    - Interested candidates should attend mandatory informational session on March 21 (registration: tinyurl.com/GI2018MAR)
  - Exam:
    - Third National GI Certification Program (NGICP) exam held November 14, 2017
  - 15 Partner jurisdictions, in addition to DC Water, formalized to date (commitments totaling over $500K)
  - Third Train-the-Trainer workshop to be held in San Francisco March 7-9, 2018
  - Website: www.ngicp.org

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NATIONAL GREEN INFRASTRUCTURE ngicp CERTIFICATION PROGRAM

Green Alley Partnership with DDOT


Key Map

- DC Water has partnered with DDOT to construct permeable pavement with alley work
  - Standard green alley approach to facilitate construction and permitting
  - Blanket permit via Department of Energy and Environment secured to allow for fast implementation
  - AlleyPalooza 5 launched April 20, 2017
  - DC Water funding construction of seven alleys (six in Rock Creek and one in Potomac River) under Green Alley Partnership

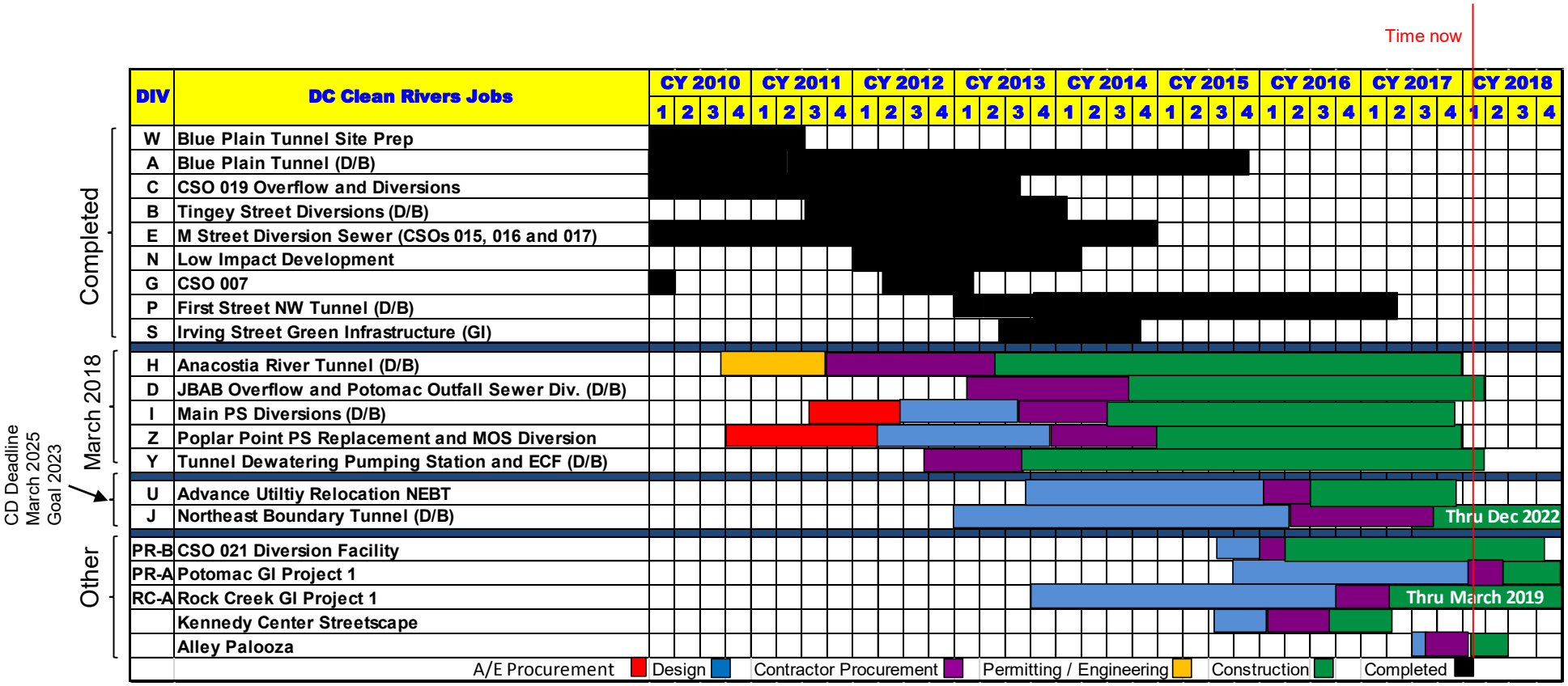

AlleyPalooza 5 Kickoff – April 20, 2017

Rock Creek Sewershed Alleys in Green Alley Partnership

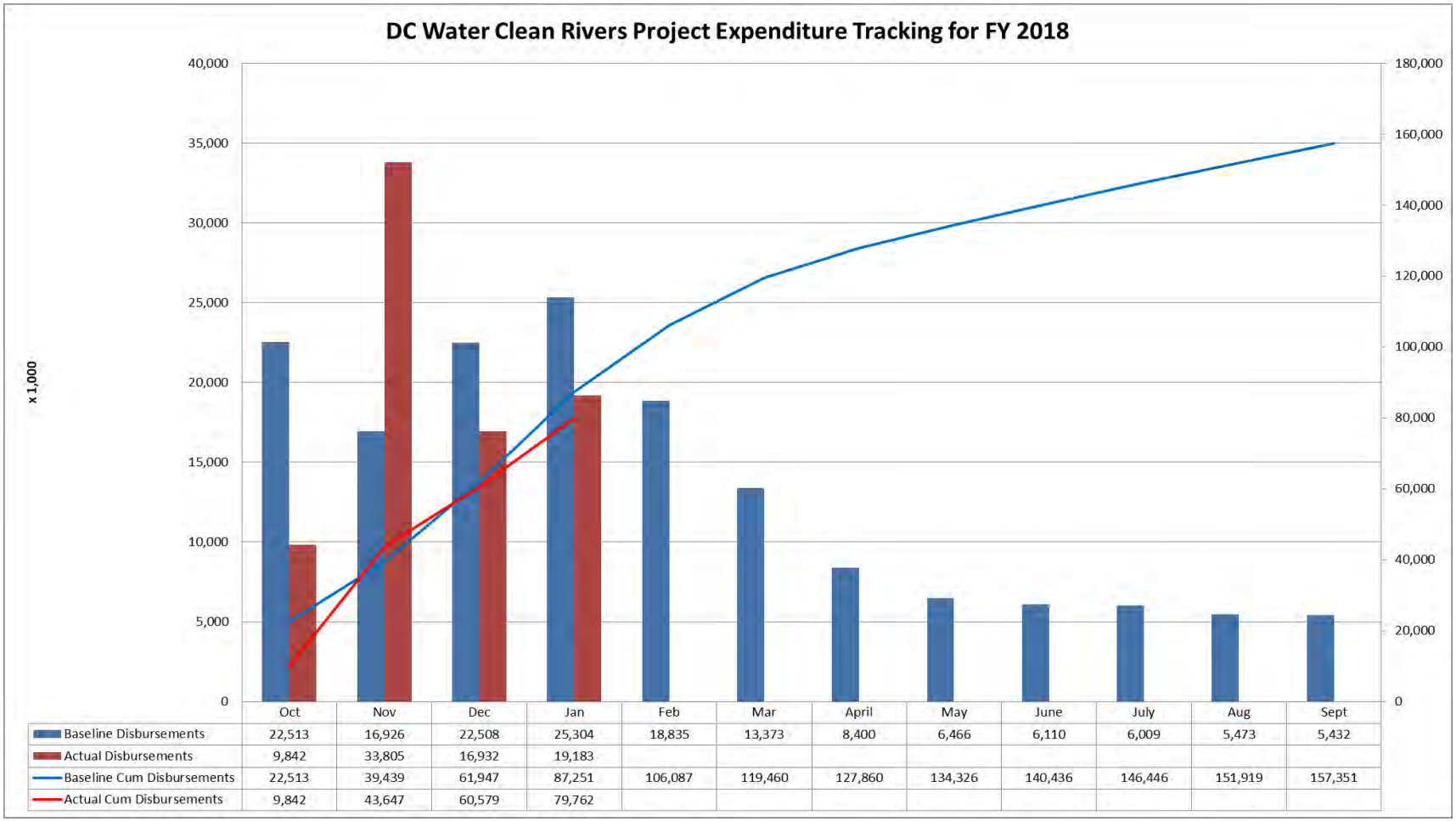
Benefits:

- **Reduces costs for DC Water's GI Program for CSO control**
- **Advances District's *Sustainable DC Plan***
- **Reduces disruption for residents**

DC Clean Rivers Schedule



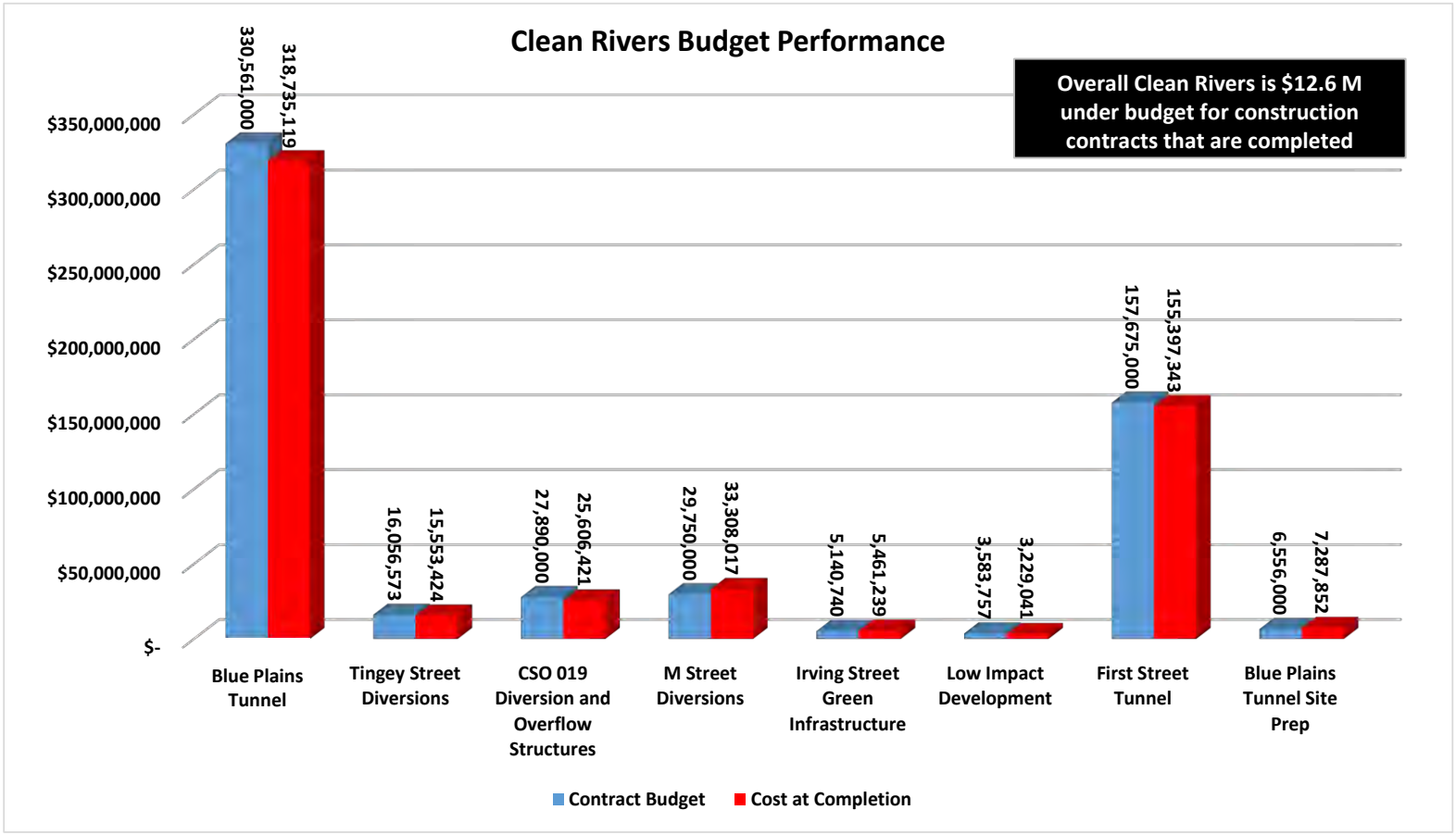
FY2017 Spending Status



	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept
Baseline Disbursements	22,513	16,926	22,508	25,304	18,835	13,373	8,400	6,466	6,110	6,009	5,473	5,432
Actual Disbursements	9,842	33,805	16,932	19,183								
Baseline Cum Disbursements	22,513	39,439	61,947	87,251	106,087	119,460	127,860	134,326	140,436	146,446	151,919	157,351
Actual Cum Disbursements	9,842	43,647	60,579	79,762								

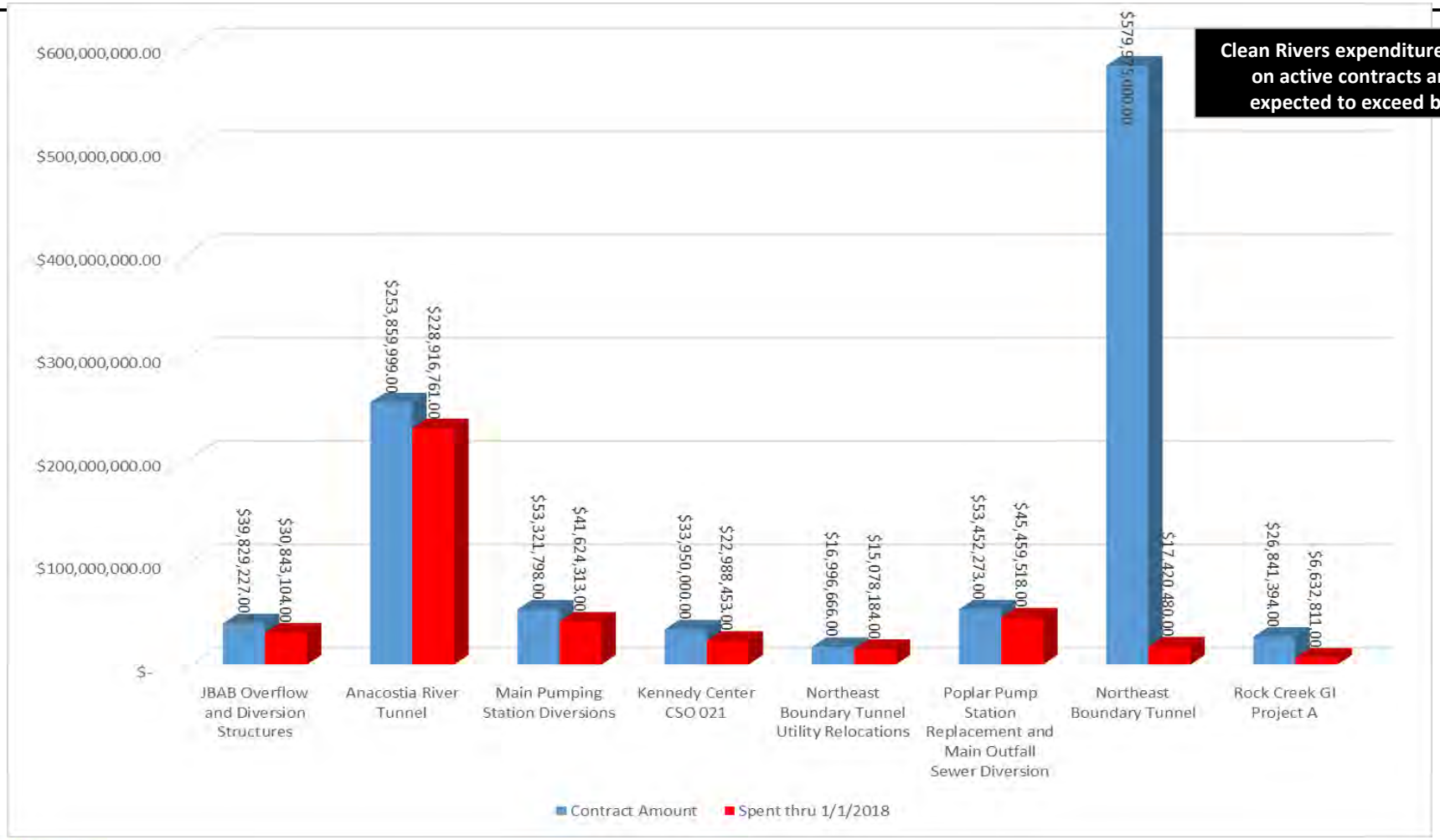
Clean Rivers is on track to meet its planned FY18 spending.

Clean Rivers Budget for Completed Contracts



dc clean RIVERS PROJECT

Clean Rivers Budget for Active Contracts



Clean Rivers expenditures to date on active contracts are not expected to exceed budget

dc clean RIVERS PROJECT

DC Water Delivers on a Cleaner Anacostia River

- Grand Opening of the Clean Rivers Tunnel System! Come Join Us!

- Looking forward to celebrating March 22, 2018
  - **Location:** 2600 Independence Avenue SE
    (near RFK Stadium's Lot 8)
  - **Time:** 1-2:30 pm

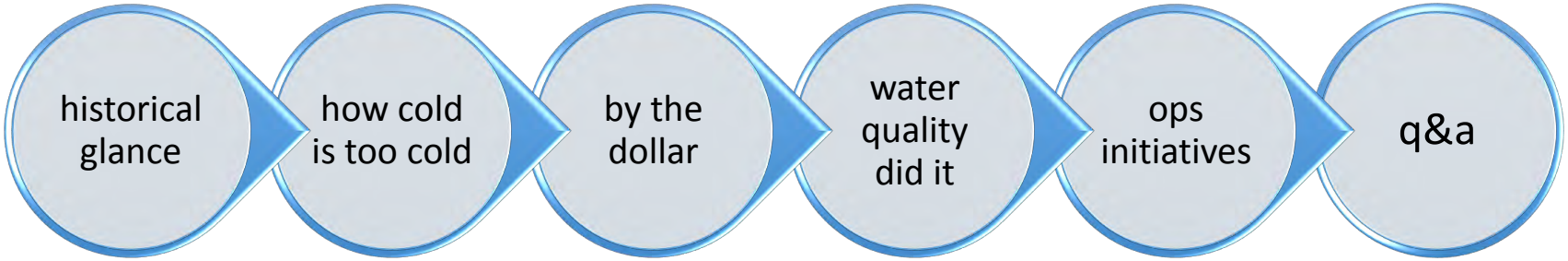
dc clean RIVERS PROJECT

water main break review:
a brief review of an operational norm

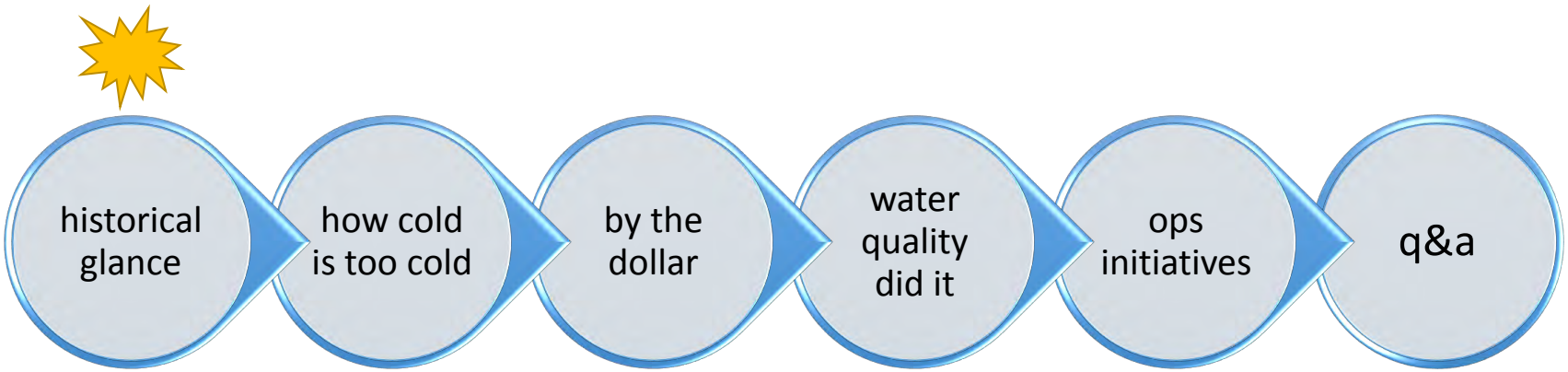
Environmental Quality and Operations Committee

Thursday March 15, 2018

agenda


historical glance
how cold is too cold
by the dollar
water quality did it
ops initiatives
q&a

agenda


historical glance
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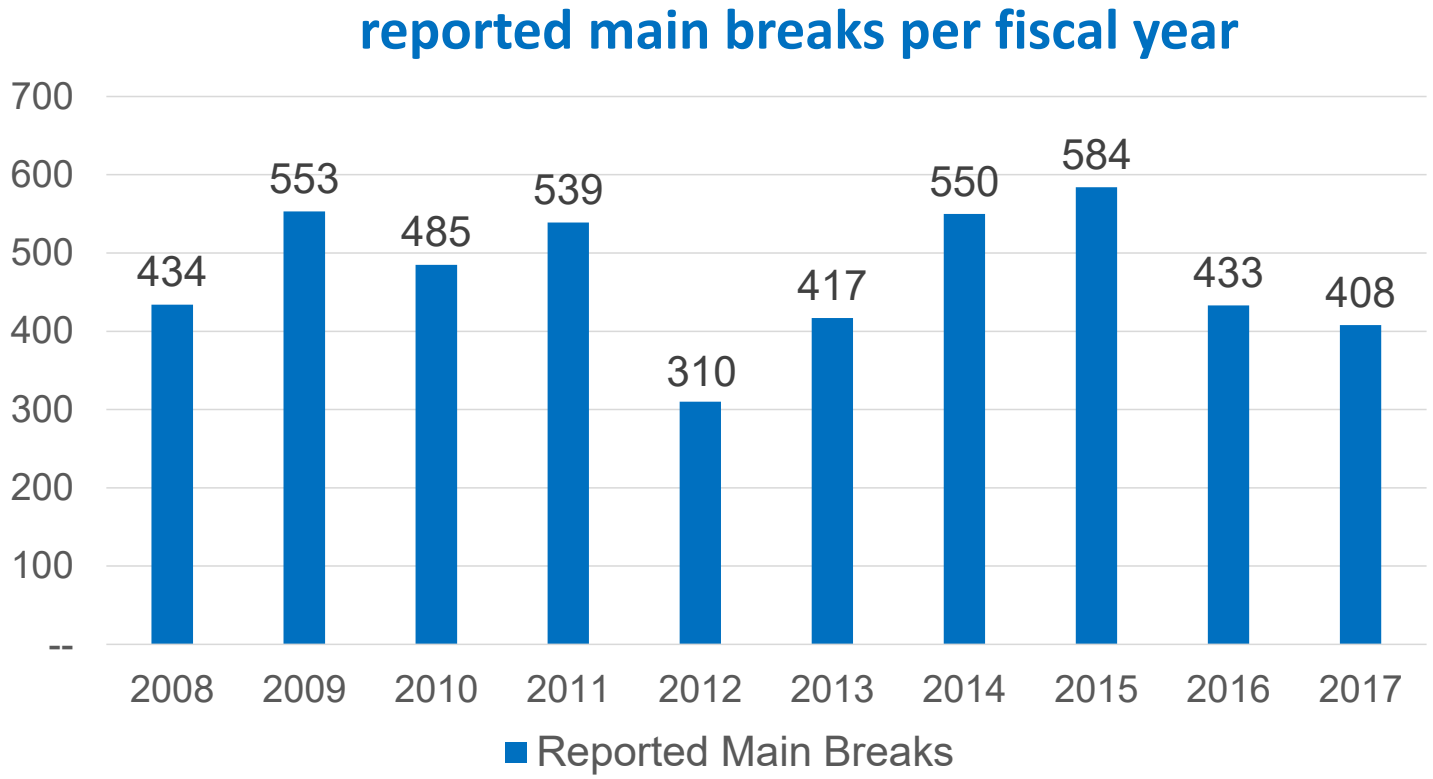
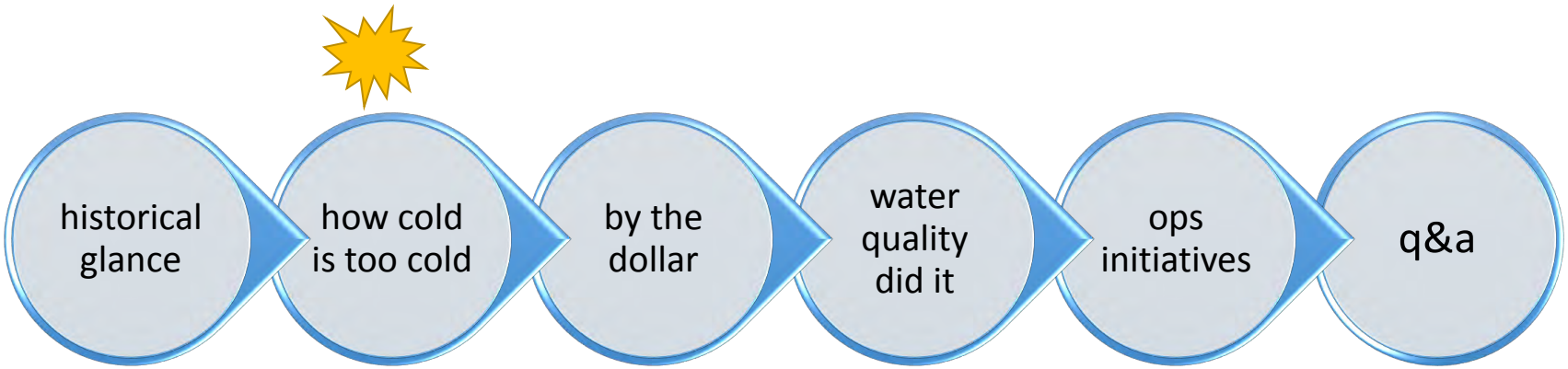
historical glance: by the year



historical glance: by comparison

- how do we compare?
  - *National average: 25 breaks / 100 miles of pipe*
  - DC Water: 30.6 breaks / 100 miles of pipe in FY 2017
  - Based on the 2017 AWWA Utility Benchmarking Survey, breaks per 100 mile for combined utilities ranged from 10 to 49.

agenda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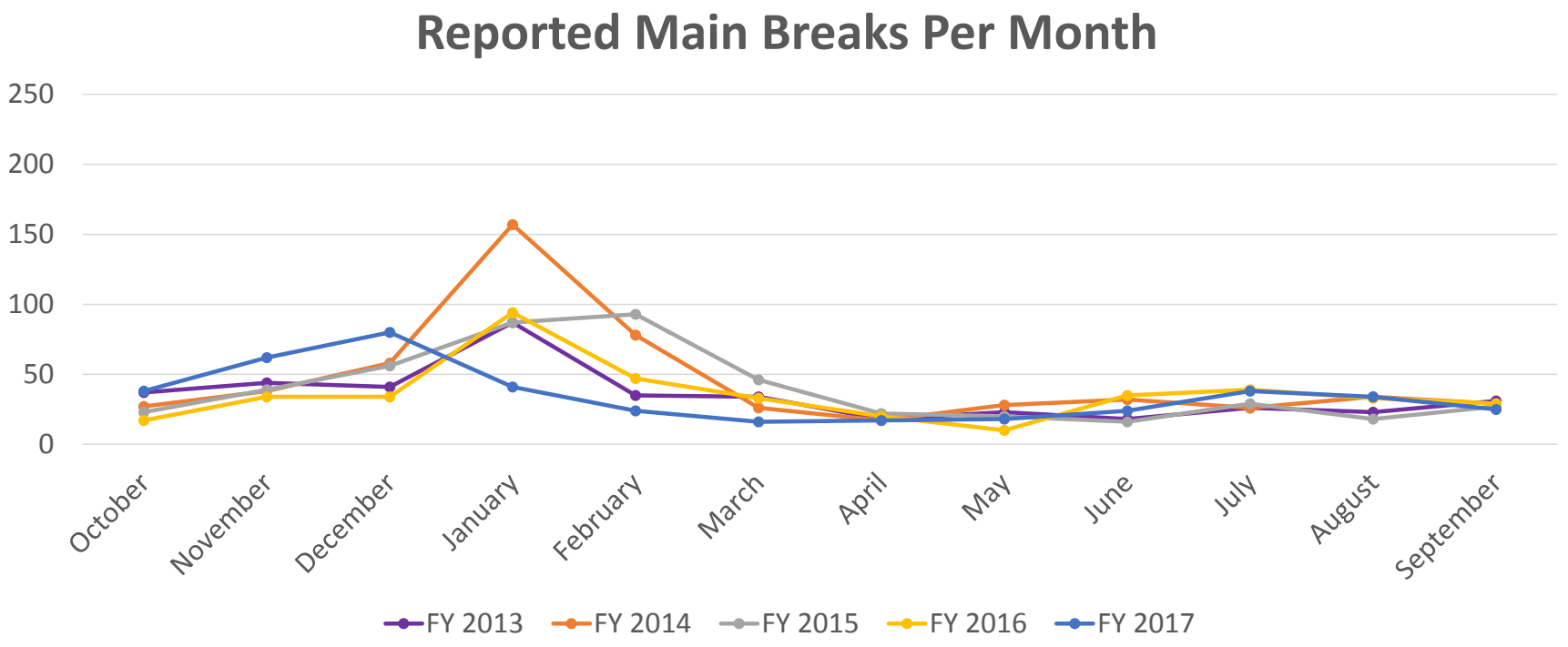
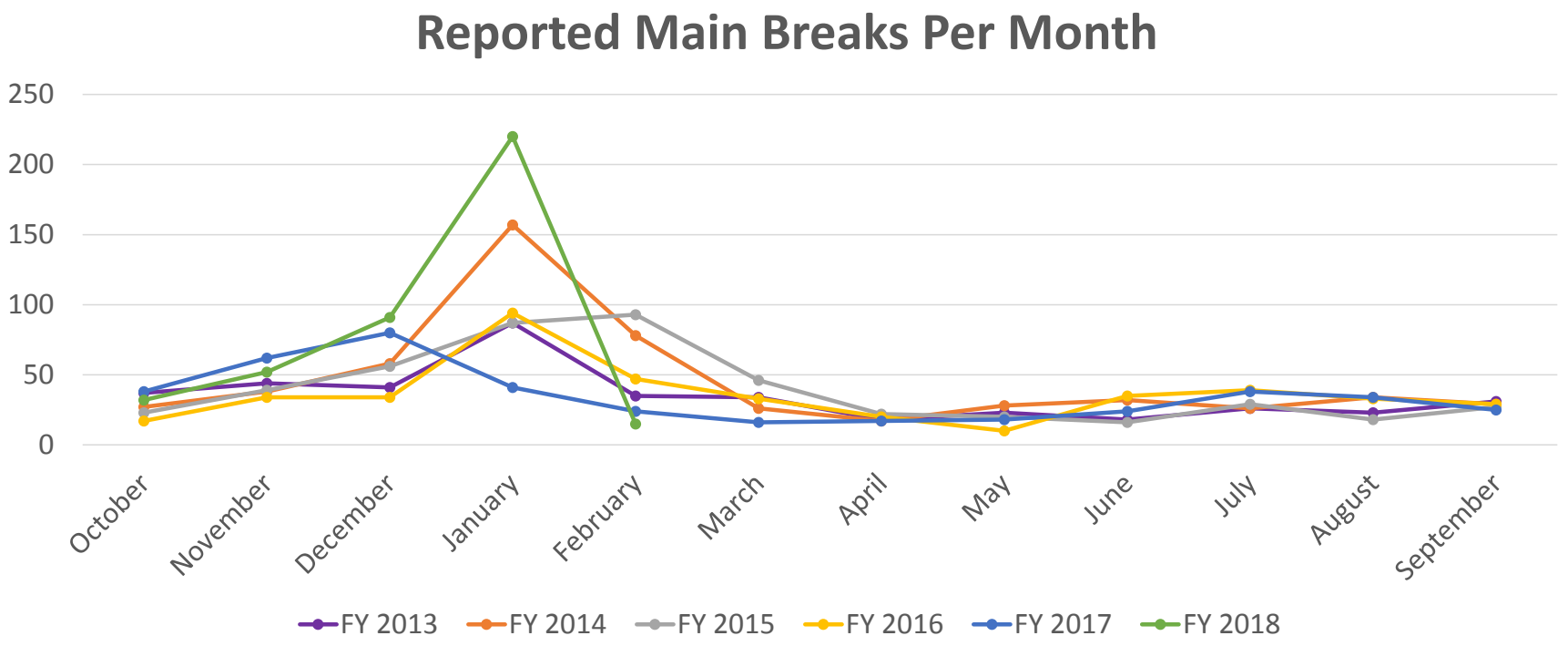
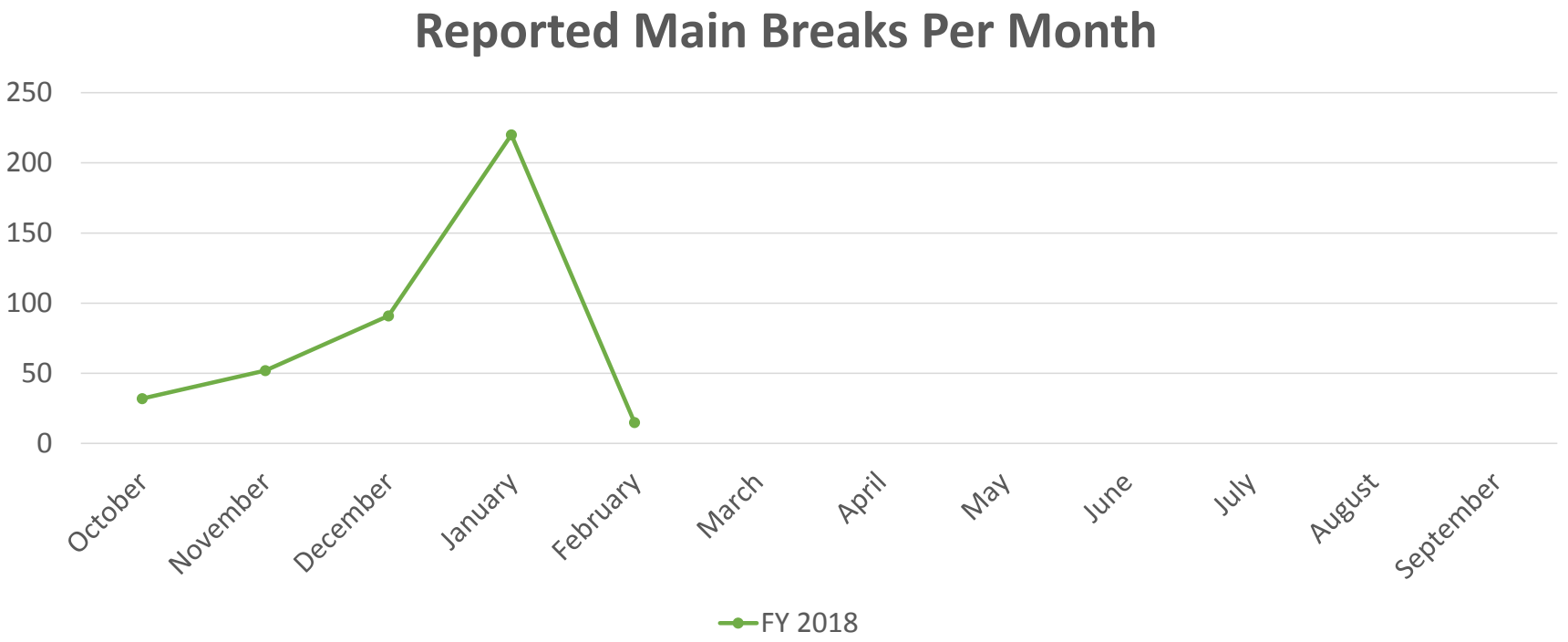
how cold is too cold?



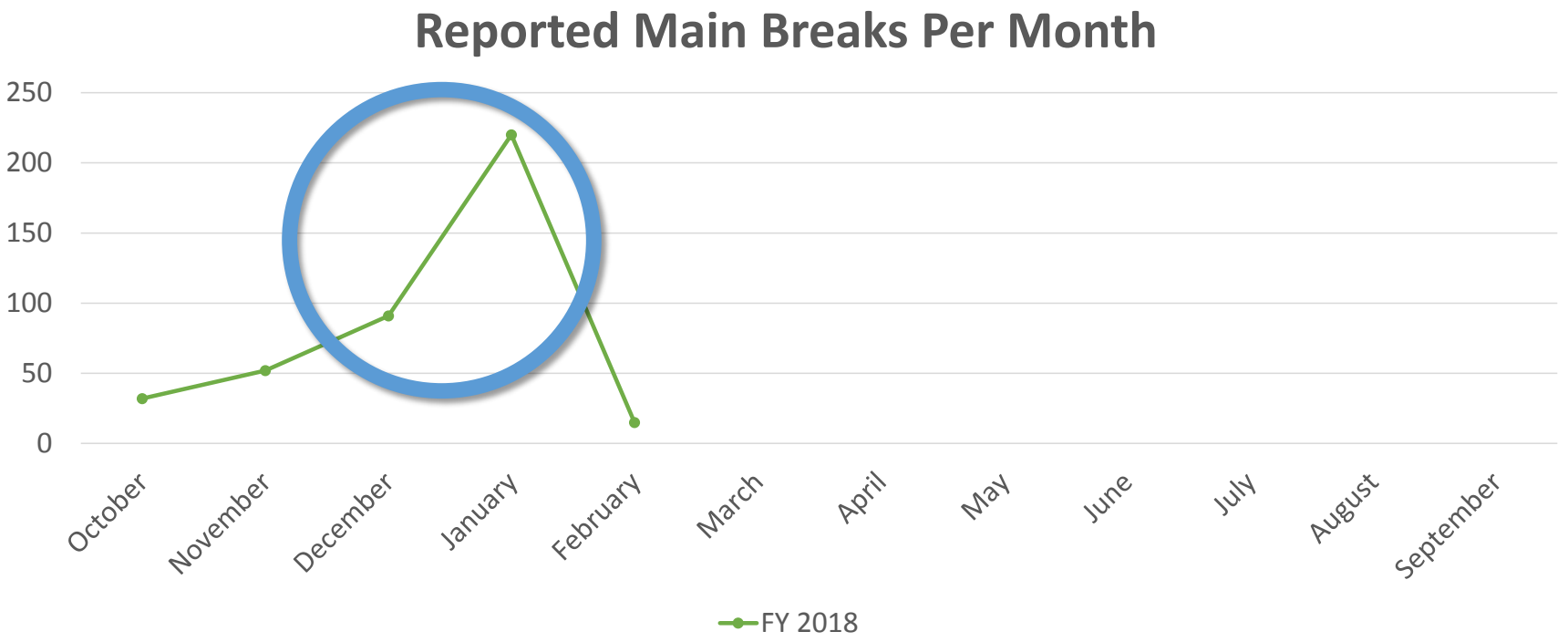
how cold is too cold?



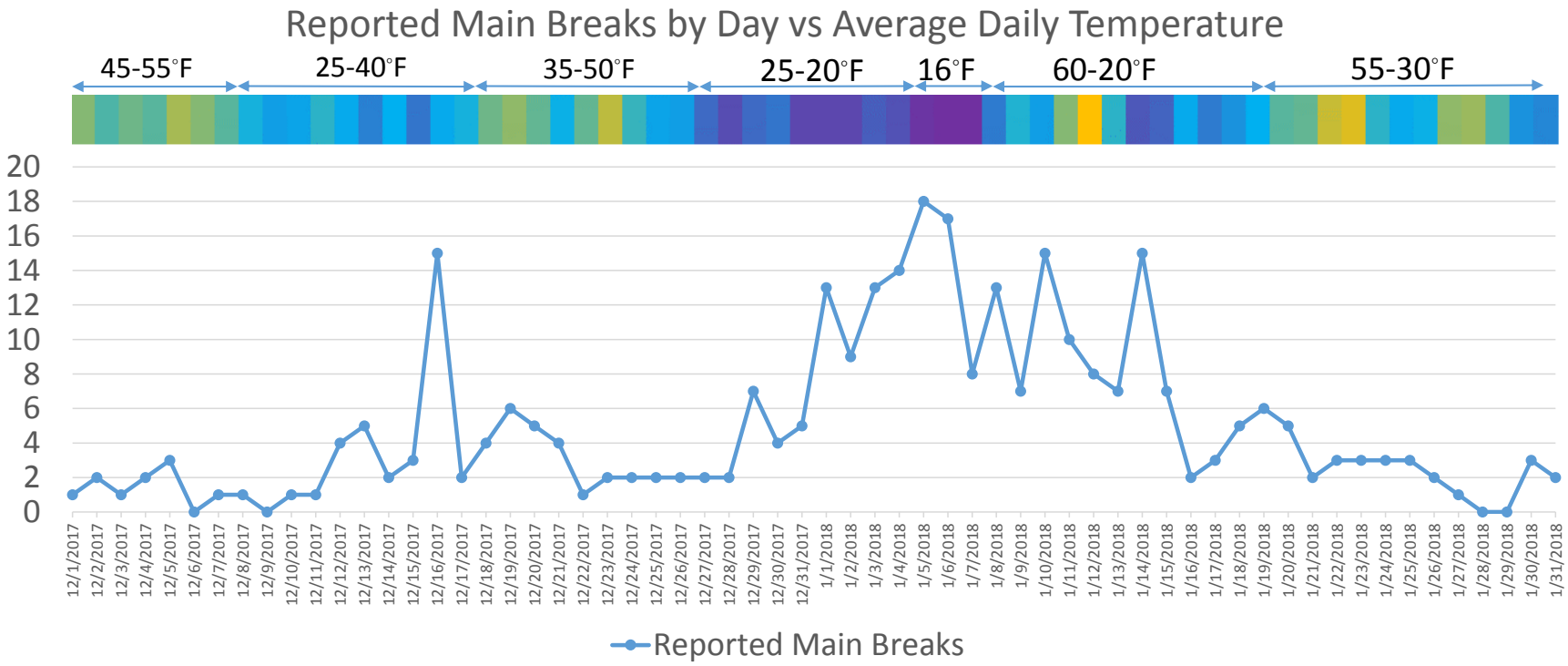
how cold is too cold?



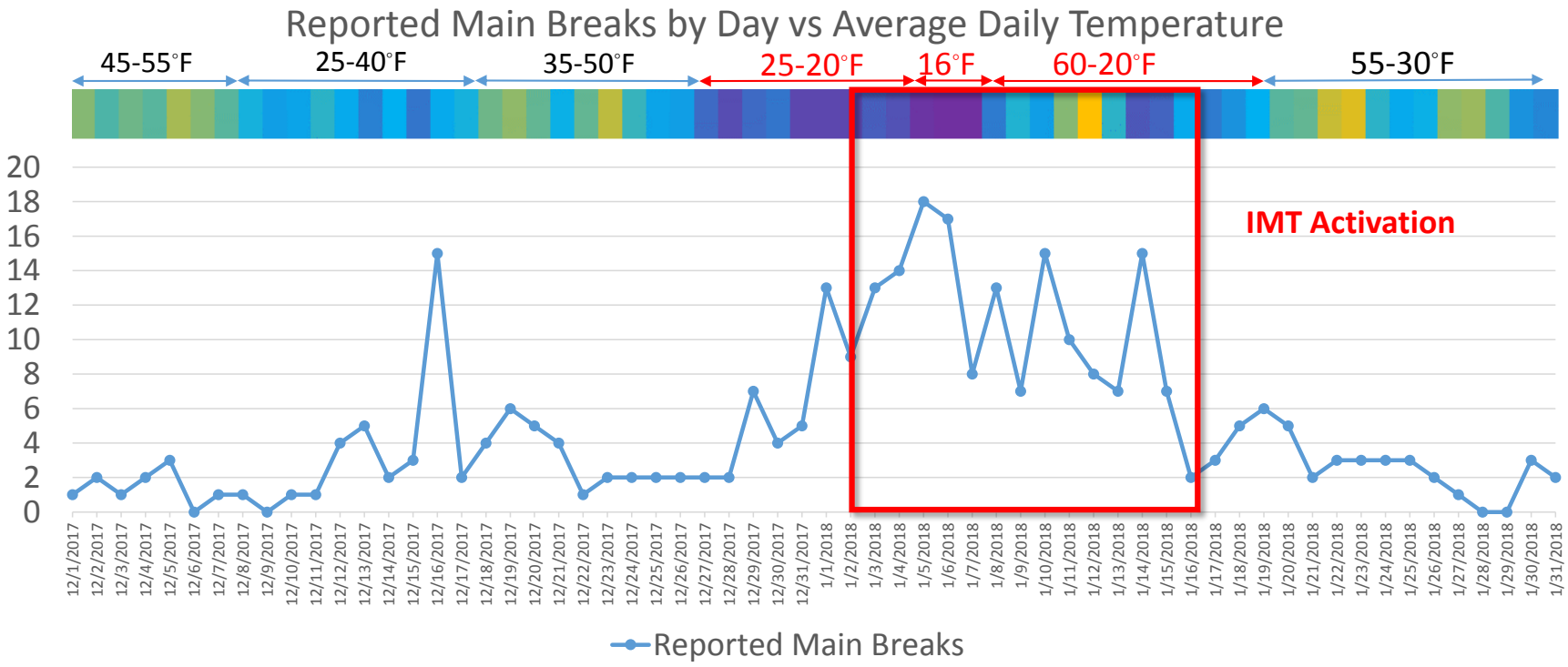
how cold is too cold?



how cold is too cold?



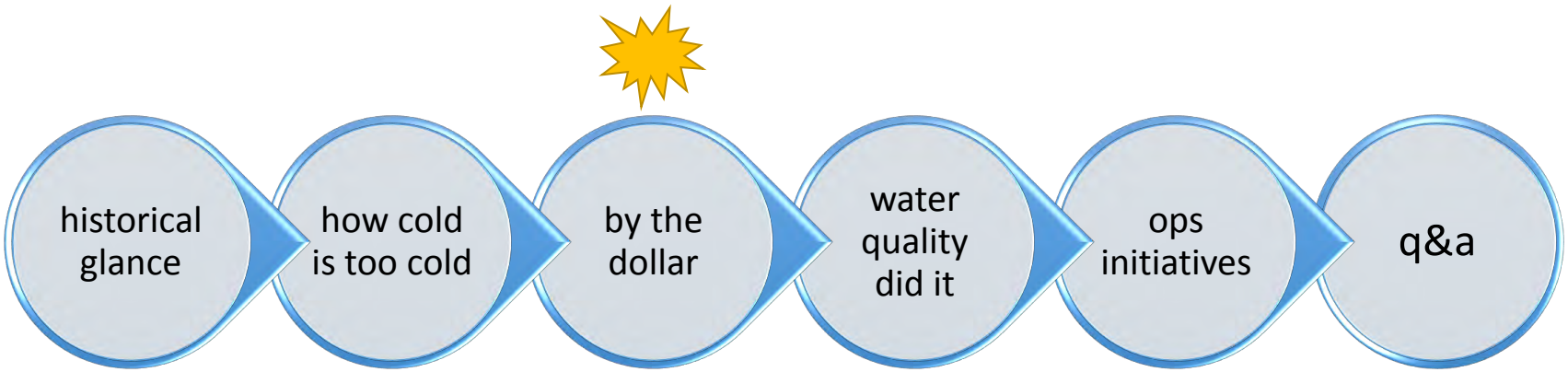
how cold is too cold?



how cold is too cold?

- break activity has been mostly seasonal
- pipe condition plays a role
  - age, material type, etc.
- system information is very critical
  - valve status
  - pumping operations
  - CIP planning

agenda


historical glance
how cold is too cold
by the dollar
water quality did it
ops initiatives
q&a

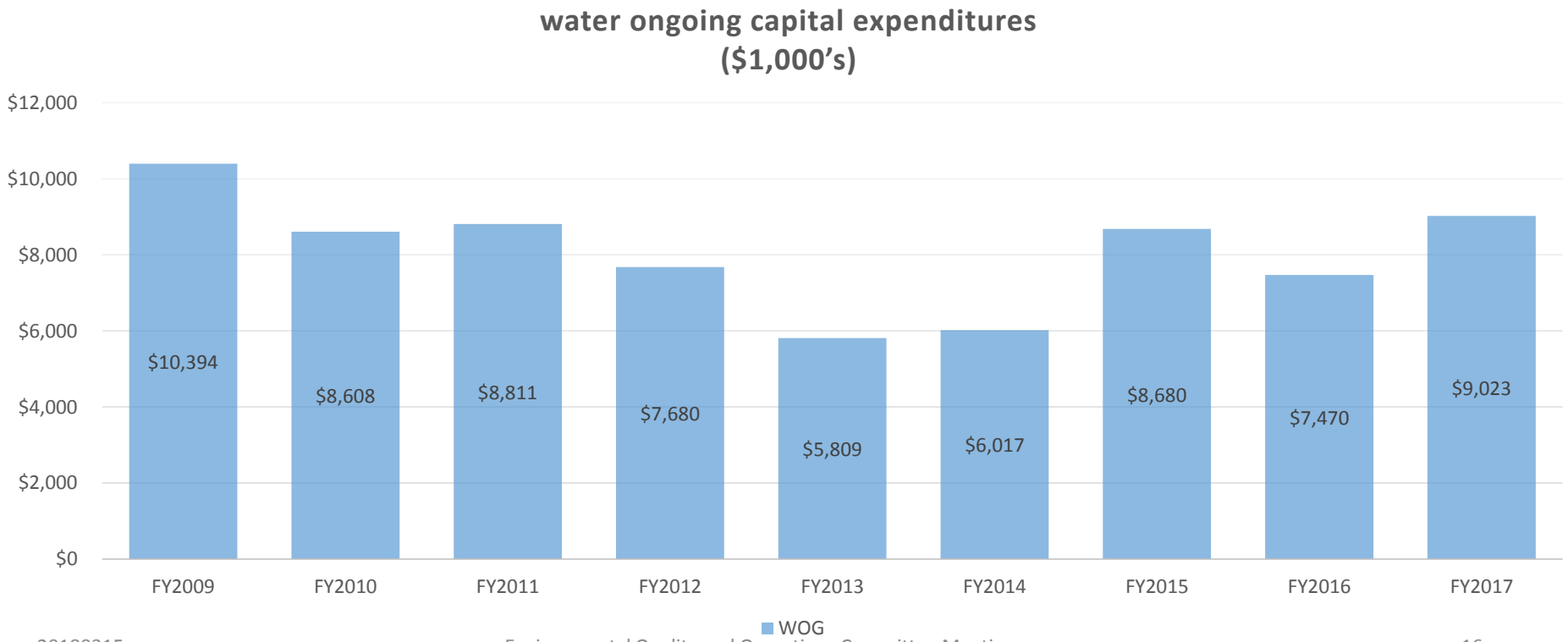
by the dollar

- the average main break costs have fluctuated between $8,000.00 - $20,000.00 per location

- **operational overtime**, **contractor costs**, and **public restoration costs** have been leading contributors to increased costs.

- annual expenditures in these areas have continued to expand and contract

by the dollar



by the dollar

FY	SPECIAL PROJECTS		HIGH COST JOBS > $100,000		TOTAL
	#	COST	#	COST	
FY 13	2	$846,140.93	3	$641,915.14	$1,488,056.07
FY 14	0	$0.00	2	$489,205.56	$489,205.56
FY 15	0	$0.00	6	$1,025,803.27	$1,025,803.27
FY 16	0	$0.00	7	$917,134.82	$917,134.82
FY 17	3	$657,301.89	4	$770,920.61	$1,428,222.50
	5	$1,503,442.82	22	$3,844,979.40	$5,348,422.22

by the dollar

HIGH COST JOBS	FISCAL YEAR	REPAIR	RESTORATION	COST
4th St & M St SW	16	$69,540.79	$37,658.84	$107,199.63
14th St & New York Ave NW	16	[illegible]	[illegible]	$100,941.46
4560 Macarthur Blvd NW	17	$58,486.90	$354,364.04	$412,850.94
1818 Kalorama Rd NW	17	$12,773.61	$96,180.03	$108,953.64
16th St & Somerset PlNW	17	[illegible]	[illegible]	$112,838.17

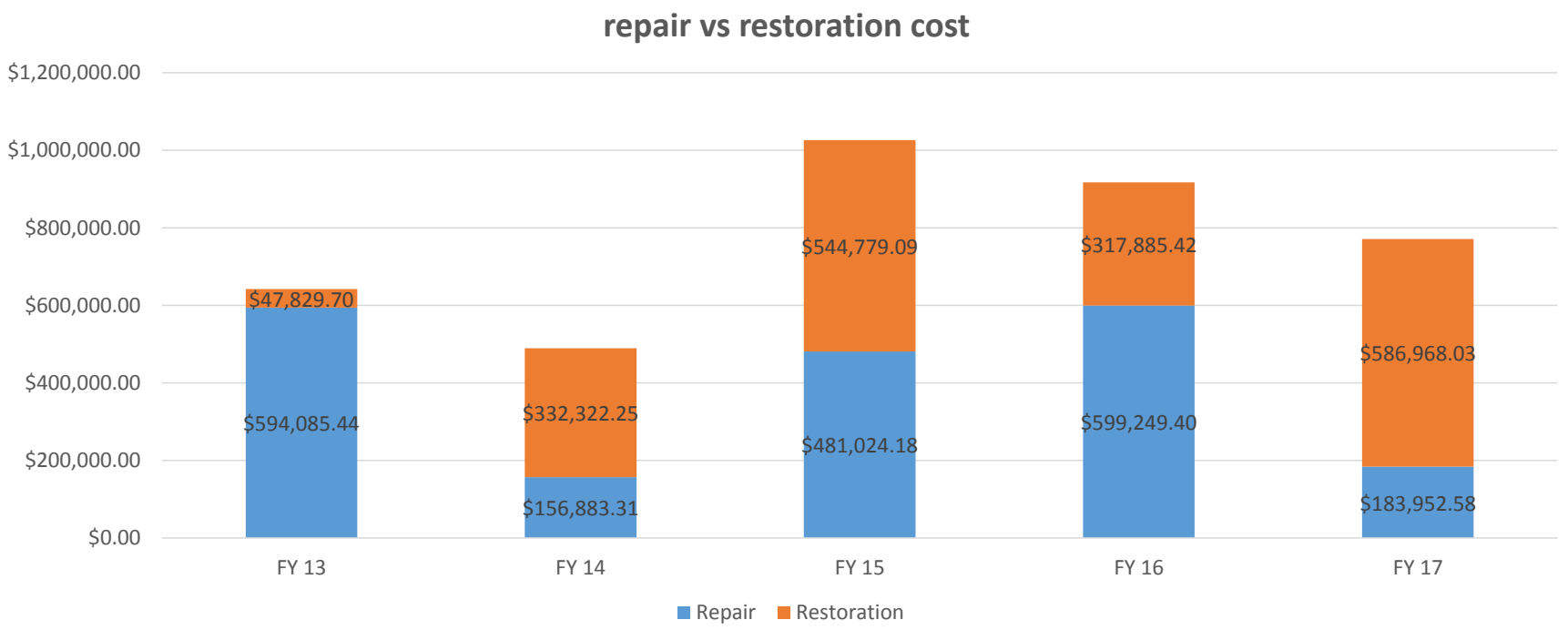
by the dollar

- 4560 MacArthur Blvd., NW Main Repair
  - Reported: May 17, 2017
  - Repaired: May 19, 2017
  - Repair: 30-inch broken water main repaired and a new 6-inch blow off valve installed
  - Asset Data:
    - Main – 30-inch cast iron
    - Org. Installed – 01.01.1860
  - ~157 years old
  - with **86%** of the costs towards roadway restoration

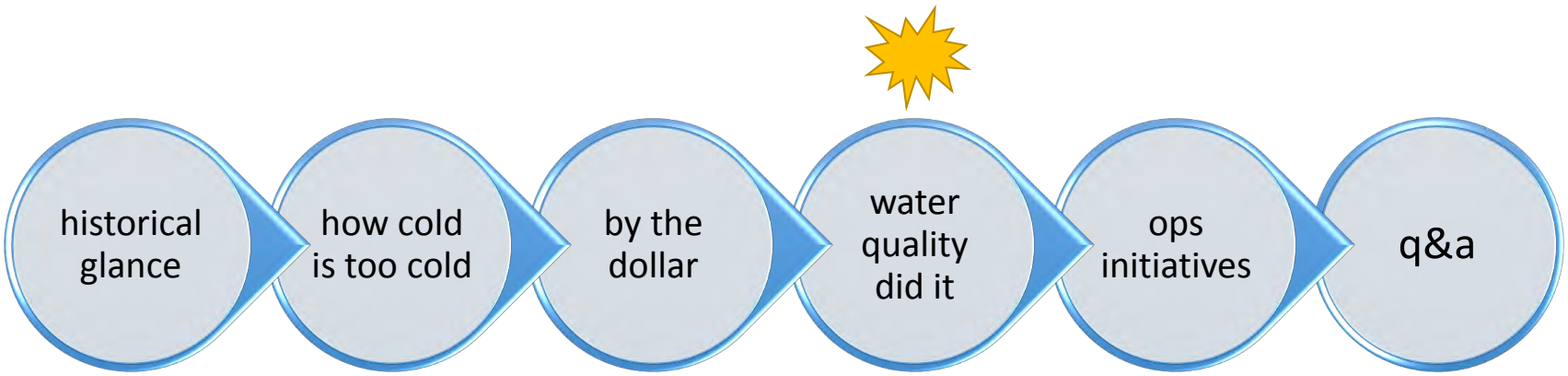
by the dollar

- 1818 Kalorama Road, NW Main Repair
  - Reported: November 16, 2016
  - Repaired: November 17, 2016
  - Repair: 6-inch broken water main repaired (main broke two additional times during recharge)
  - Asset Data:
    - Main – 6-inch cast iron
    - Org. Installed – 07.11.1893
  - ~123 years old!
  - with **88%** of the costs towards roadway restoration

by the dollar



agenda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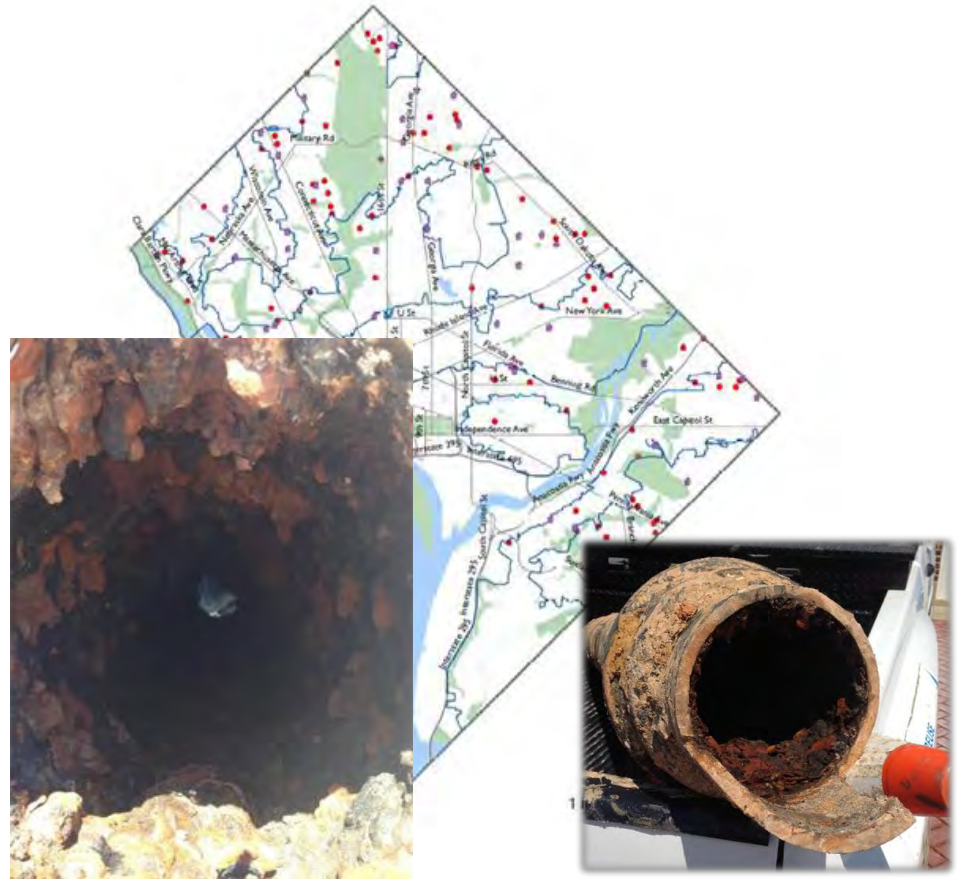
dc water is life®
water quality did it
• they tried to tell us
• get the unlined cast iron out
• 1350 miles of pipe in the water distribution system
• approximately 740 miles are unlined cast iron
• creates water quality challenges
• not always the oldest pipe
20180315
Environmental Quality and Operations Committee Meeting
23

water quality did it

- routine flushing within 83 areas every 1-4 months to maintain clear water
- that's approximately 12,540 homes
  - ~ 3 blocks per area
  - ~ 50 homes per block
- working to keep it clear



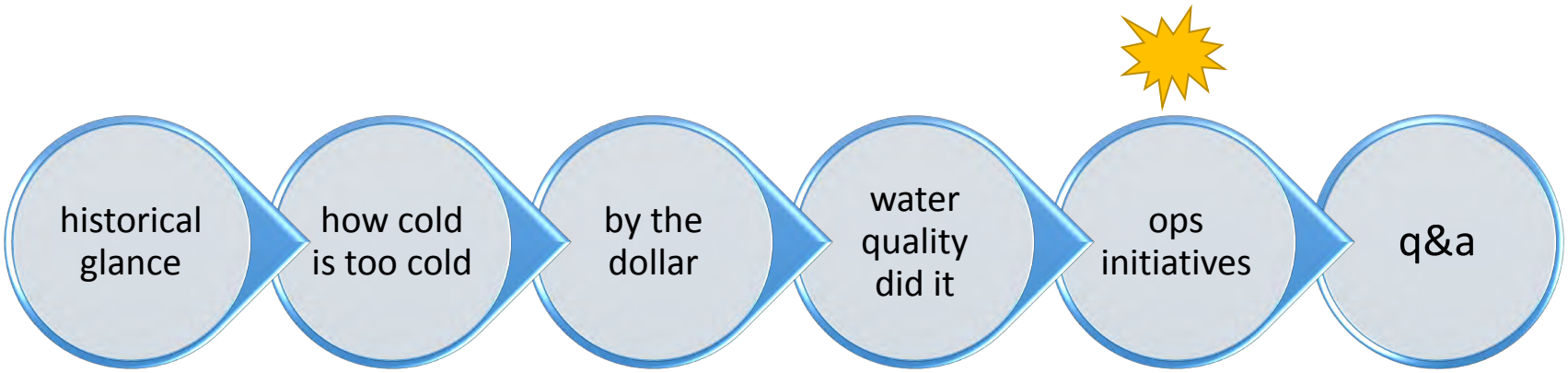
water quality did it

- ice slurry traveling down the main

water quality did it

- ice pigging results

agenda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operational initiatives

- continued in-house main replacements
  - removing unlined cast mains
  - small areas/neighborhoods with highest complaints
  - dedicated internal operational resources (with support from DETS)

- improved efficiencies
  - L.A.M.B.
  - data collection and analysis
  - improved valve system data
  - cost effective system analysis (i.e. RedZone)

- continue to highlight and support addressing the WQ challenges in the system

- all working towards providing outstanding customer service.

operational initiatives

- in-house main replacement (example)

Evarts St NE Main Replacement & Upgrade Project

- Replace approx. 315 feet of water main
- Upgrade 11 lead service lines
- Construction start: May 2018
- Construction completion*: August 2018
- Asset Data:
  - Main – 8-inch cast iron
  - Org. Installed – 06/24/1920
- ~98 years old

operational initiatives

- continued in-house main replacements
  - removing unlined cast mains
  - small areas/neighborhoods with highest complaints
  - dedicated internal operational resources (with support from DETS)

- improved efficiencies
  - L.A.M.B.
  - data collection and analysis
  - improved valve system data
  - cost effective system analysis (i.e. RedZone)

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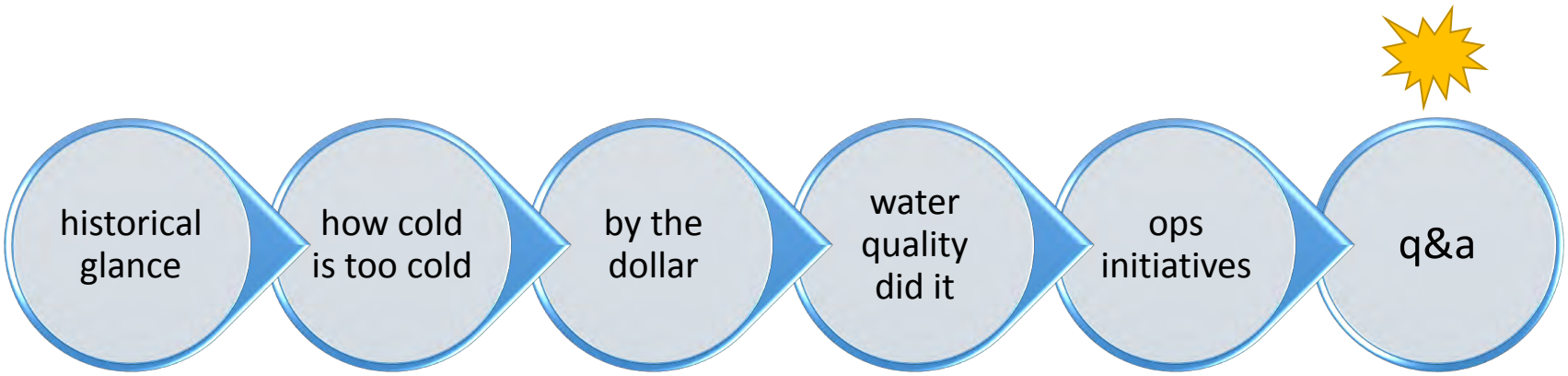
agenda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q&a


THANKS

dc water is life

Sewage Pumping Stations Flood Protection Status

Main sewage pumping station

Main Sewage Pumping Station

O Street Sewage Pumping Station

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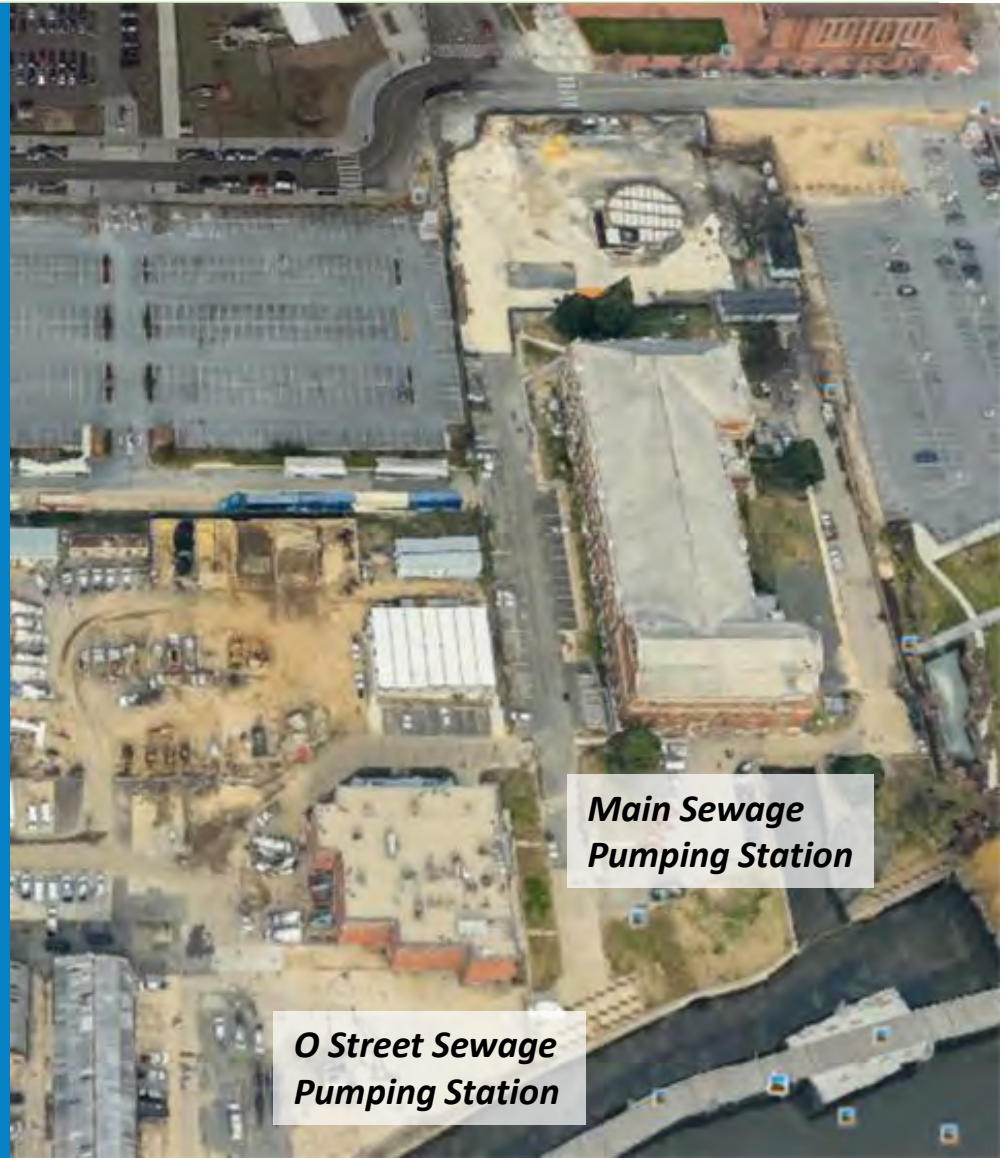
Agenda

- Introduction / Background
- Pumping Station Risk Categorization
- Proposed Main Pumping Station Flood Hardening Project
- O Street Pumping Station and Headquarters
- Summary



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Introduction / Background

- Risk assessment is based on a 2014 evaluation of 2010 FEMA flood mapping
  - Currently updating with 2017 FEMA mapping
- All datums corrected to historic DC Datum based on "US Army Corps of Engineers, Flood Emergency Manual (draft, October 2015)"
- Risk impacted by infrastructure configuration
  - Elevations of entrances, floor, pumping equipment
  - Means of stormwater conveyance
  - Further investigations and site visits would be required to confirm risk level and protection requirements

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PS Flood Risk Categorization

Pump Station (PS)		At Risk with 100-year Floodplain (FEMA 2010)	At Risk with 500-year Floodplain (FEMA 2010)
1	Rock Creek PS	No	Yes
2	Potomac PS	No	Yes
3	3rd & Const. Ave PS	No	Yes
4	Main St PS	Yes	Yes
5	O St PS	No	No
6	New Poplar Point PS	No	No
7	East Side PS	Yes	Yes
8	Earl Place PS	No	No
9	Upper Anacostia PS	No	Yes

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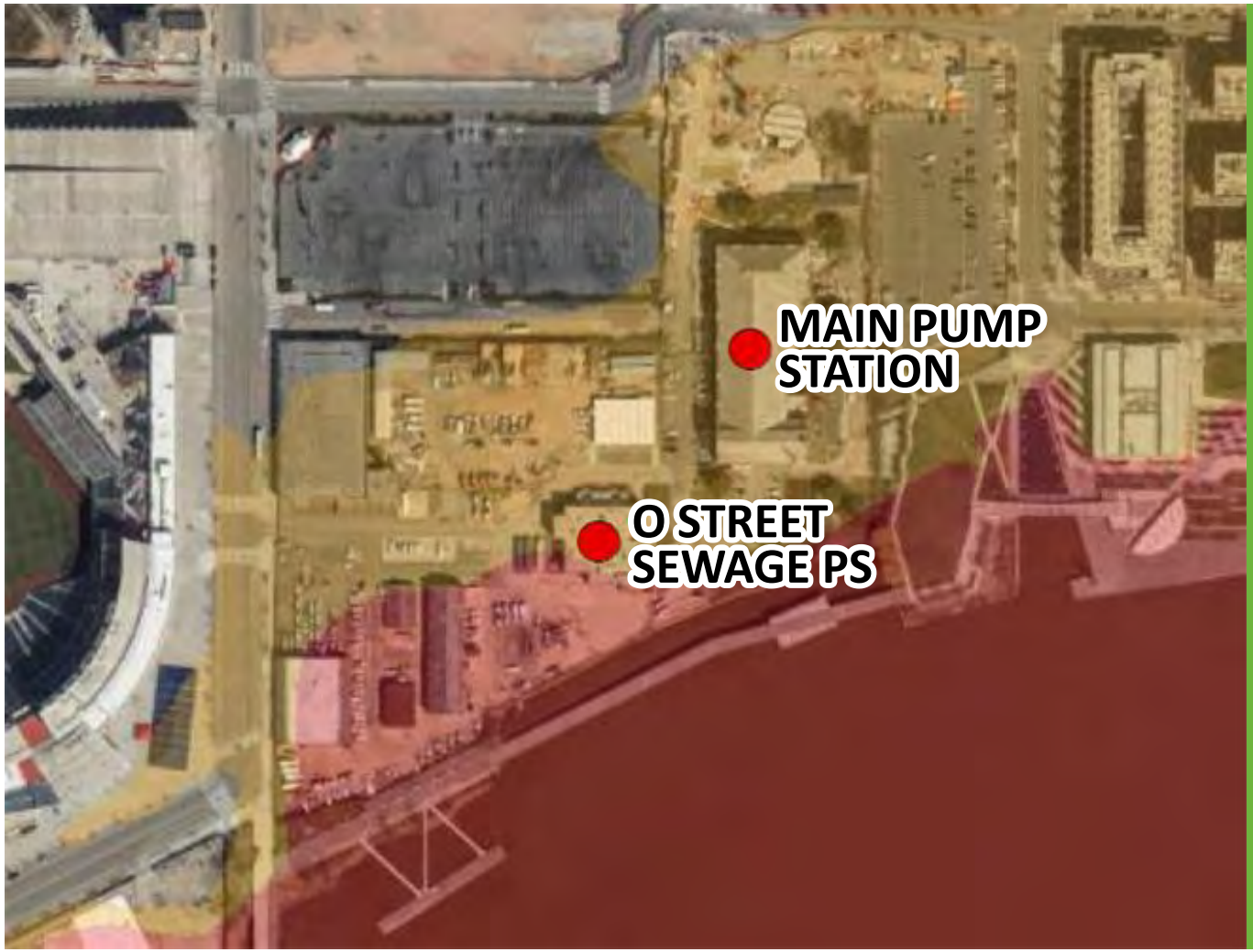
Main and O Street Pump Station (PS) Inundation



HIGH RISK
(1% annual chance, or 100-year floodplain)

MODERATE RISK
(0.2% annual chance, or 500-year floodplain)

Notes:
1. Risk imagery taken from current (2017) FEMA map resources web site

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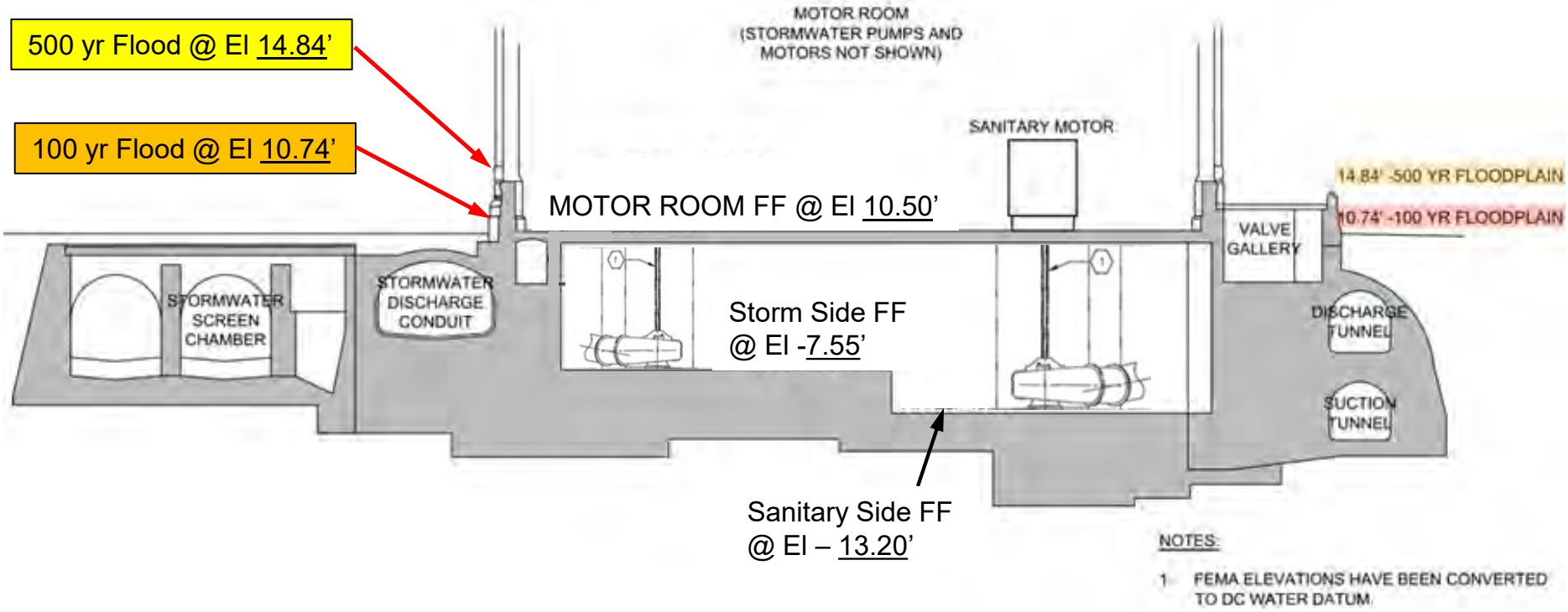
Main Sewage PS



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FEMA Grant Funding for Main PS Flood Mitigation

Main Pumping Station, Front Entrance

Project budget: $1,598,569
Grant support: 75%
Completion date: 09/30/2018

Hazard Mitigation Grant

PDMCPJ-03-DC-2014-002

Flood Mitigation to Elev. +13.8 ft.

(i.e.. above FEMA 100-year event; ~equiv. to Cat 2 Hurricane surge)

Scope of Grant

- Interior watertight doors
- Disconnect floor drains
- Sealing of building penetrations
- Exterior doorway protection
- Modification of elevator shaft
- Parging of ventilation shaft
- Modifications to inflatable dam control structures
- Exterior equipment protection (e.g. hvac and transformers)

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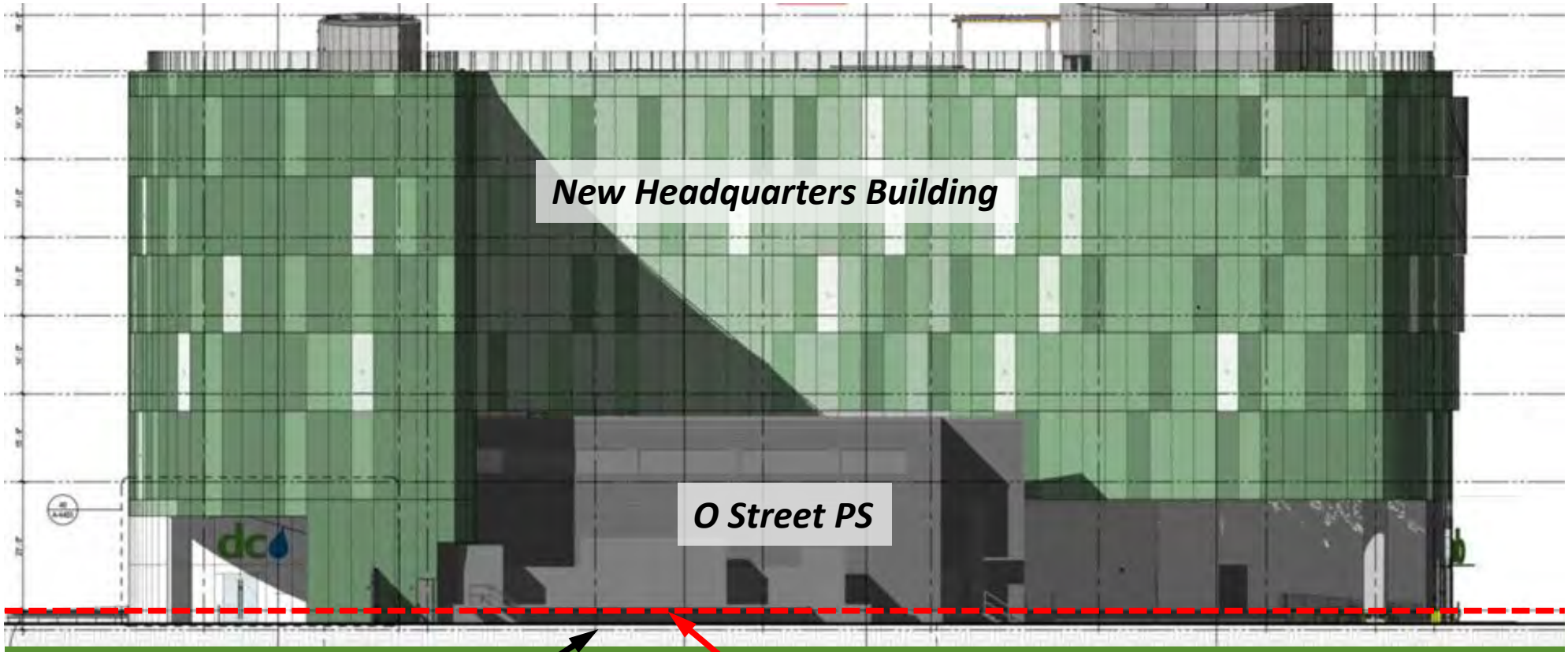
O Street PS and Headquarters



Exterior grade level: +11.0 ft.

Interior first floor level: +15.0 ft. (both HQ and PS)

500-year flood: +14.84 ft.

100-year flood: +10.74 ft.

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Summary

- Two of nine stations currently at risk under a 100-yr flood
  - Six of nine stations at risk under a 500-yr flood
- Project currently proposed for Main PS to protect it to over the 100-year flood
- Currently no funding included in CIP for flood protection at any of the other sewage pump stations.
- DC Water Emergency Management Plan
  - Addresses flood preparation for all DC Water facilities including pumping stations

DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY
BOARD OF DIRECTORS CONTRACTOR FACT SHEET

ACTION REQUESTED

ENGINEERING SERVICES SUPPLEMENTAL AGREEMENT

Construction Management Services, Anacostia River Combined Sewer Overflow (CSO) Control Projects, Division Z - Poplar Point Pumping Station Replacement and Main Outfall Sewers Diversion (Joint Use)

Approval to execute Supplemental Agreement No. 2 for $740,000.00. The modification exceeds the General Manager's approval authority.

CONTRACTOR/SUB/VENDOR INFORMATION

PRIME:	SUBS:		PARTICIPATION:
AECOM Services of DC 3101 Wilson Boulevard Suite 900 Arlington, VA 22201 Headquarters Los Angeles, CA 90067	SZ PM Consultants, Inc. Oakton, VA	MBE	27.9%
	Savin Engineers, PC Washington, DC	MBE	4.7%
	Sigma Associates, Inc. Detroit, MI	WBE	19.5%

DESCRIPTION AND PURPOSE

Original Contract Value:	$4,891,074.00	
Value of Previous Supplemental Agreement:	$1,992,719.57	
Value of this Supplemental Agreement:	$ 740,000.00	
Cumulative SA Value, including this SA:	$2,732,719.57	
Current Contract Value, Including this SA:	$7,623,793.57	
Original Contract Time:	958 Days	(2 Years, 8 Months)
Time Extension, this SA:	214 Days	
Total SA contract time extension:	549 Days	(1 Year, 8 Months)
Contract Start Date:	11-15-2014	
Contract Completion Date:	12-31-2018	

Purpose of the Contract:

To provide onsite construction management (CM) of Division Z – Poplar Point Pumping Station Replacement (DC Clean Rivers Project) construction contract.

This work is required by Consent Decree.

Original Contract Scope:

- Provide CM and other services to assist DC Water with construction of Division Z. Division Z includes construction of a new 55 MGD Poplar Point Sewage Pumping Station (PP-PS), the Anacostia Main Interceptor (AMI) Diversion Chamber, the AMI Diversion Sewer, the Emergency Overflow Structure, the 42" Force Main, the Discharge Connection Chamber, and the Main Outfall Sewers Diversion Chamber.
- Provide CM services to assist DC Water with the replacement of the Barry Road sewer.
- Work in cooperation and consultation with DC Water and the DC Clean Rivers Project Program Consultants Organization to effectively manage the construction work required to provide completed Division Z facilities.
- Provide field inspection services for the oversight of the construction work as well as oversight during startup and operational training for the newly constructed PP-PS.

Previous Supplemental Agreement Scope:

- To extend onsite CM of Division Z Poplar Point Pumping Station Replacement and Main Outfall Sewers Diversion due to unforeseen delay in the construction of the project. The Contractor will be working 24/7 to recover schedule which requires augmented CM manpower to provide appropriate construction oversight.
- Extend CM, contract administration and resident engineering and inspection services by 335 days to assist DC Water with Division Z Construction Contract.

Current Supplemental Agreement Scope:

- To extend onsite CM of Division Z Poplar Point Pumping Station Replacement due to further unforeseen delays in the construction of the project. The Contractor will be working extended hours which requires augmented CM manpower to provide appropriate construction oversight.
- Extend CM, contract administration and resident engineering and inspection services by 214 days to assist DC Water with Division Z Construction Contract.

Future Supplemental Agreement Scope:

- No future supplemental agreement is anticipated at this time.

PROCUREMENT INFORMATION

Contract Type:	Cost Plus Fixed Fee	**Award Based On:**	Highest Ranking Score
Commodity:	Professional Services	**Contract Number:**	DCFA - #463-WSA
Contractor Market:	Open Market		

BUDGET INFORMATION

Funding:	Capital	**Department:**	DC Clean Rivers Project
Service Area:	Combined Sewer Overflow	**Department Head:**	Carlton M. Ray
Project:	CY		

ESTIMATED USER SHARE INFORMATION

User	Share %	Dollar Amount
District of Columbia	90.00%	$ 666,000.00
Federal Funds	0.00%	$
Washington Suburban Sanitary Commission	10.00%	$ 74,000.00
Fairfax County	0.00%	$
Loudoun County & Potomac Interceptor	0.00%	$
Total Estimated Dollar Amount	**100.00%**	**$ 740,000.00**

Leonard R. Benson / 3-7-18
Chief Engineer — Date

Dan Bae / 3/9/18
Director of Procurement — Date

Matthew T. Brown / 3/8/18
Chief Financial Officer — Date

Henderson J. Brown, IV / _____
Interim CEO and General Manager — Date

DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY
BOARD OF DIRECTORS CONTRACTOR FACT SHEET

ACTION REQUESTED

ENGINEERING SERVICES:

Grit, Screening and Primary Facilities Upgrades (Joint Use)

Approval to execute an architectural and engineering services contract for $1,000,000.

CONTRACTOR/SUB/VENDOR INFORMATION

PRIME:	SUBS:		PARTICIPATION:
HDR Engineering, Inc. 11820 Fountain Way, Suite 204 Newport News, VA 23606 Headquarters Omaha, Nebraska 68114	Milhouse Engineering & Const., Inc. Gaithersburg, MD.	MBE	33.0%
	PDH Associates, Inc. Potomac, MD.	WBE	7.1%

DESCRIPTION AND PURPOSE

Contract Value, Not-To-Exceed:	$1,000,000	
Contract Time:	240 Days	(0 Years, 8 Months)
Anticipated Contract Start Date:	05-01-2018	
Anticipated Contract Completion Date:	12-27-2018	

Other firms submitting proposals/qualification statements:

CDM Smith	JMT*
GHD Group*	O'Brien & Gere (OBG)
Hazen and Sawyer	RK&K

* Asterisk indicates short listed firms.

Purpose of the Contract:

The Grit, Primary and Screens Facilities have experienced accelerated deterioration due to a corrosive environment caused by hydrogen sulfide gases. As a result, electrical equipment needs to be evaluated as well as ancillary equipment and processes in an effort to provide continued reliable service for another 20 years. This contract serves to provide engineering services for the development of a concept finalization/preliminary design report (CF/PDR), participation in Value Engineering Study and provide design lock-in documentation for work identified through a condition assessment.

A Future Supplemental Agreement will follow once the concept finalization / preliminary design report and design lock-in has been undertaken. The supplemental agreement will include design, bid phase services, O&M Manual development, services during construction, start-up phase, and commissioning phase assistance.

Contract Scope:

- Undertake field reviews and develop a condition assessment.
- Develop a Basis of Design memorandums.
- Define an opinion of probable construction costs.
- Produce a concept finalization / preliminary design report.
- Participate in value engineering workshops, and formalization of design lock-in documentation.

PROCUREMENT INFORMATION

Contract Type:	Lump Sum	**Award Based On:**	Highest Ranking Score
Commodity:	Engineering Design Services	**Contract Number:**	DCFA#483-WSA
Contractor Market:	Open Market		

BUDGET INFORMATION

Funding:	Capital	**Department:**	Wastewater Engineering (DWE)
Service Area:	Wastewater Treatment	**Department Head:**	Diala Dandach
Project:	BQ		

ESTIMATED USER SHARE INFORMATION

User	Share %	Dollar Amount
District of Columbia	41.22%	$ 412,200.00
Federal Funds	0.00%	$
Washington Suburban Sanitary Commission	45.84%	$ 458,400.00
Fairfax County	8.38%	$ 83,800.00
Loudoun County & Potomac Interceptor	4.56%	$ 45,600.00
Total Estimated Dollar Amount	**100.00%**	**$ 1,000,000.00**

3-7-18
Leonard R. Benson / Date
Chief Engineer

FOR 3/8/18
Matthew T. Brown / Date
Chief Financial Officer

3/9/18
Dan Bae / Date
Director of Procurement

Henderson J. Brown IV / Date
Interim CEO and General Manager

DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY
BOARD OF DIRECTORS CONTRACTOR FACT SHEET

ACTION REQUESTED

CONSTRUCTION CONTRACT

Division PR-A1 – Potomac River Project A1 (GI)
(Non-Joint Use)

Approval to execute a construction contract for $6,265,502.47

CONTRACTOR/SUB/VENDOR INFORMATION

PRIME:	SUBS:	PARTICIPATION:
Fort Myer Construction Corporation 2237 33rd Street, NE Washington, DC 20018 (CBE)	CBE Eligible Amounts: Total Eligible $5,129,342.47 CBE* Total $5,114,342.47 See Attachment A for List of firms.	99.7%

*Based upon the Green Infrastructure (GI) Memorandum of Understanding with the District of Columbia, this contract shall utilize best efforts to maximize Certified Business Enterprise (CBE) participation, with a goal that at least 50% of the dollar amount of this contract be awarded to CBEs. No Federal funding (i.e. EPA) will be used for this contract.

DESCRIPTION AND PURPOSE

Contract Value, Not-To-Exceed:	$ 6,265,502.47
Contract Time:	320 Days (0 Years, 10 Months)
Anticipated Contract Start Date (NTP):	04-30-2018
Anticipated Contract Completion Date:	03-16-2019
Bid Opening Date:	02-14-2018
Bids Received:	3
Other Bids Received	
Anchor Construction Corporation	$ 8,984,628.00
Corman Kokosing Construction Company	$10,010,290.00

Purpose of the Contract:

Provide construction of Division PR-A1 – Potomac River Project A1 (GI) in support of DC Clean Rivers Project.

This work is required by a Consent Decree.

Contract Scope:

- Construct Green Infrastructure (GI) practices located in the public Right of Way (ROW) to manage 1.2" of rain falling on the equivalent of approximately eight (8) impervious acres within the Potomac River sewershed

Federal Grant Status:

- Construction Contract is not eligible for Federal grant funding assistance.

PROCUREMENT INFORMATION			
Contract Type:	Fixed Price	**Award Based On:**	Lowest responsive, responsible bidder
Commodity:	Construction	**Contract Number:**	150220
Contractor Market:	Open Market		

BUDGET INFORMATION			
Funding:	Capital	**Department:**	DC Clean Rivers Project
Service Area:	Combined Sewer	**Department Head:**	Carlton Ray
Project:	CZ		

***ESTIMATED USER SHARE INFORMATION**

User	Share %	Dollar Amount
District of Columbia	100.00%	$6,265,502.47
Federal Funds	0.00%	$
Washington Suburban Sanitary Commission	0.00%	$
Fairfax County	0.00%	$
Loudoun County & Potomac Interceptor	0.00%	$
Total Estimated Dollar Amount	**100.00%**	**$6,265,502.47**

3-7-18
Leonard R. Benson
Chief Engineer
Date

3/9/18
Dan Bae
Director of Procurement
Date

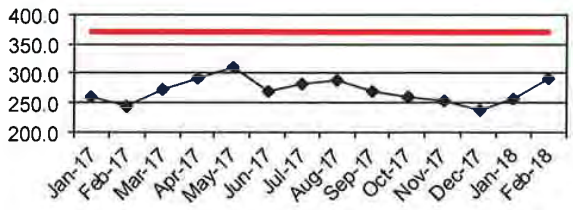
3/8/18
Matthew T. Brown
Chief Financial Officer
Date

Henderson J. Brown, IV
Interim CEO and General Manager
Date

BLUE PLAINS ADVANCED WASTEWATER TREATMENT PLANT
PERFORMANCE REPORT – FEBRUARY 2018

Average plant performance for the month was excellent with all effluent parameters well below the seven-day and monthly NPDES permit requirements. The monthly average influent flow was 290 MGD. There was 110 MG of Excess Flow during this reporting period. The following Figures compare the plant performance with the corresponding NPDES permit limits.

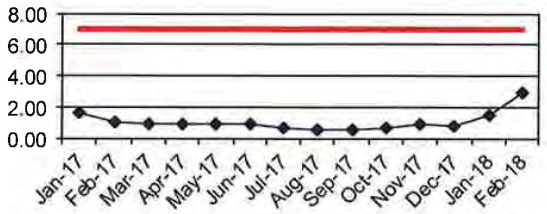
Plant Influent Flow (mgd)



Influent Flow — Average Design Capacity

This graph illustrates the monthly average influent flow to the plant. The design average flow is 370 MGD. Blue Plains has a revised 4-hour peak flow capacity of 511 MGD through complete treatment. Flows up to 336 MGD in excess of the 511 MGD peak capacity receive primary treatment, disinfection and dechlorination.

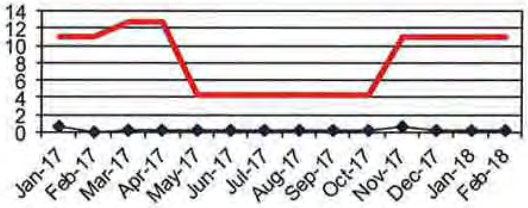
TSS (mg/l)



Effluent TSS — Permit Limit

Effluent Total Suspended Solids (TSS) is a measure of the amount of solid material that remains suspended after treatment. The effluent TSS concentration for the month averaged 2.90 mg/L, which is below the 7.0 mg/L permit limit.

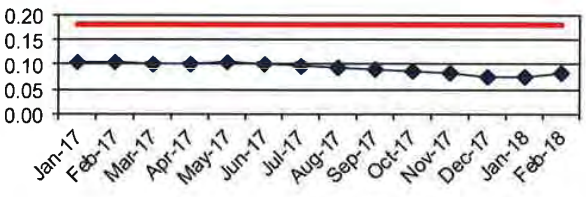
Ammonia (mg/l)



Effluent NH3 — Permit Limit

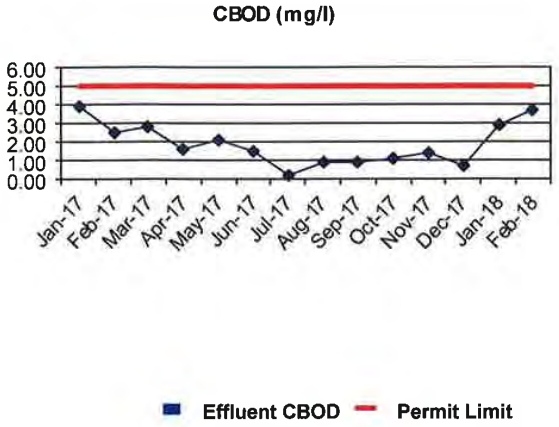
The Ammonia Nitrogen (NH3-N) is a measure of the nitrogen found in ammonia. For the month, effluent NH3-N concentration averaged 0.29 mg/L and is below the average 11.1 mg/L limit.

Total Phosphorus Annual Average (mg/l)

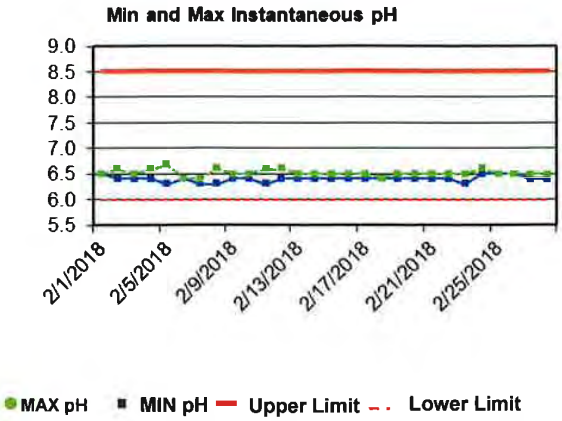


Effluent TP — Permit Limit

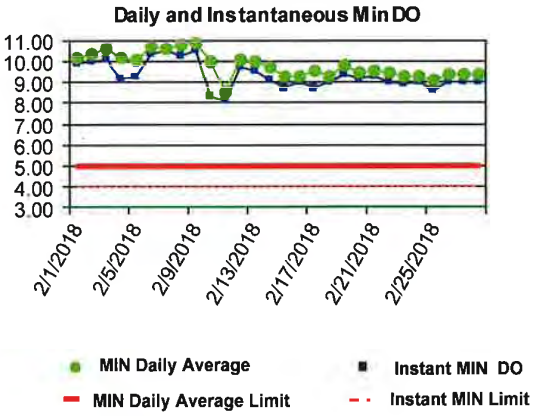
The Total Phosphorus (TP) is a measure of the particulate and dissolved phosphorus in the effluent. The annual average effluent TP concentration is 0.08 mg/L, which is below the 0.18 mg/L annual average limit.



Carbonaceous Biochemical Oxygen Demand (CBOD) is a measure of the amount of dissolved oxygen required for the decomposition of organic materials. The effluent CBOD concentration averaged 3.75 mg/L (partial month), which is below the 5.0 mg/L limit.

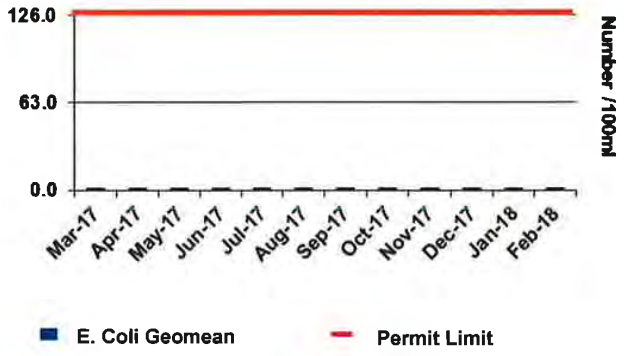


pH is a measure of the intensity of the alkalinity or acidity of the effluent. The minimum and maximum pH observed were 6.3 and 6.7 standard units, respectively. The pH was within the permit limits of 6.0 and 8.5 for minimum and maximum respectively.



Dissolved Oxygen (DO) is a measure of the atmospheric oxygen dissolved in wastewater. The DO readings for the month are within the permit limits. The minimum daily average is 8.6 mg/L. The minimum instantaneous DO reading is 8.1 mg/L. The minimum permit limits are 5.0 mg/L and 4.0 mg/L respectively.

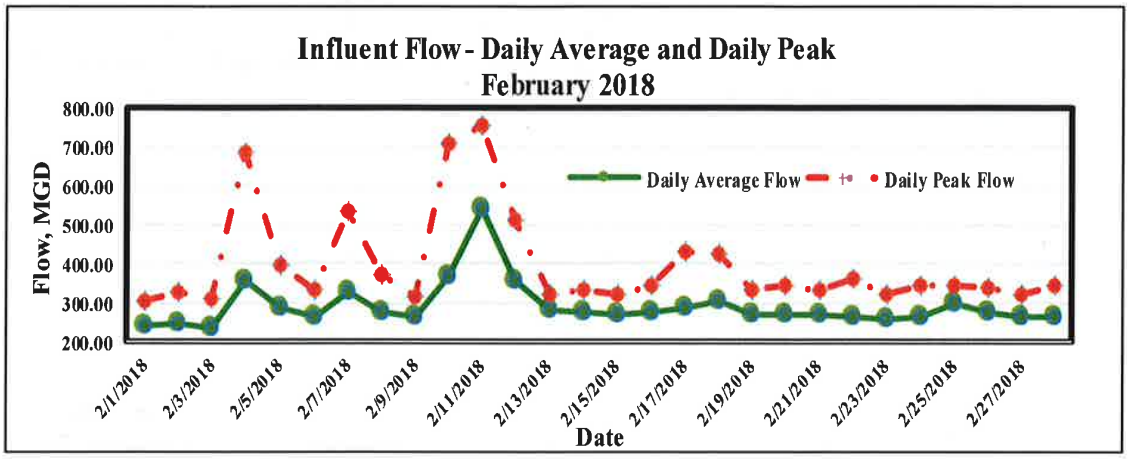
E. coli

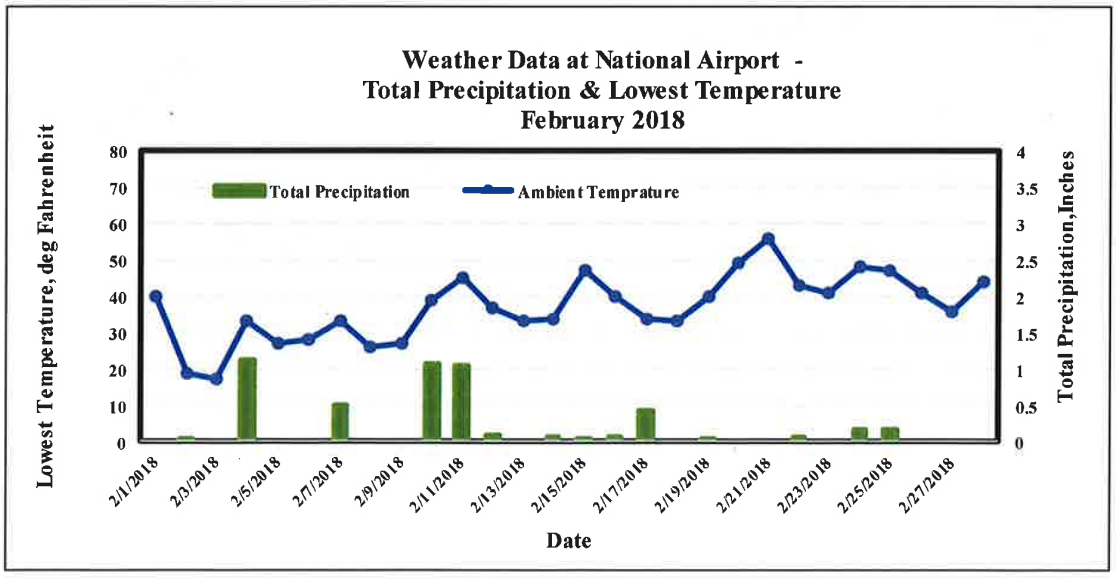


E.coli is an indicator of disease causing organisms (pathogens). The E.coli permit limit is 126/100mL. The E coli geometric mean is 1.3 /100mL, and well below the permit limit.

Winter Weather Impact on Plant Performance

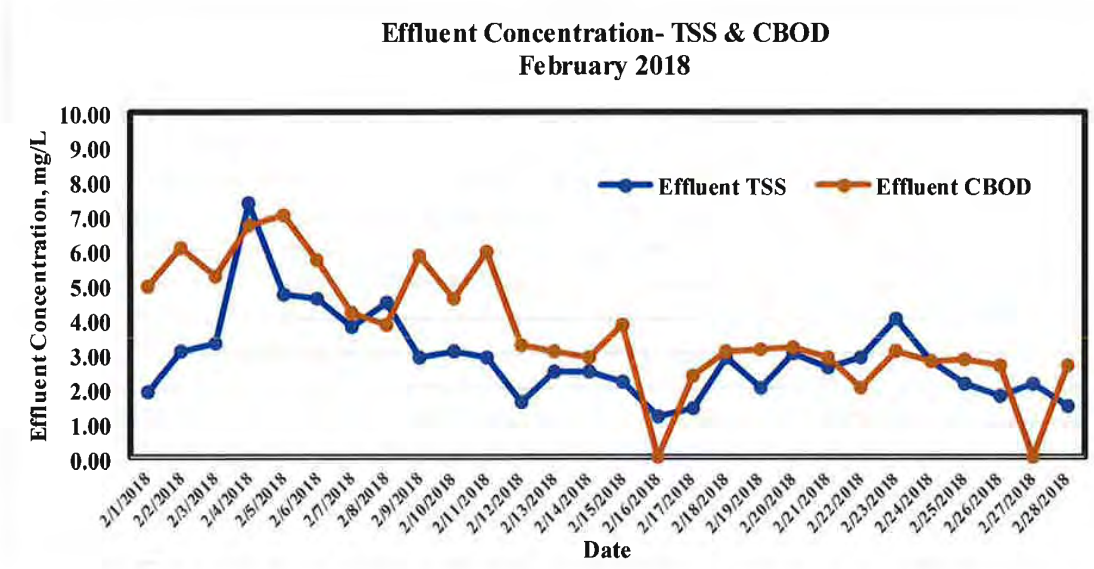
Despite higher than average monthly temperature recorded for the month of February 2018, the Washington Metropolitan Region received above normal total precipitation (4.79 inches as measured at National Airport) and few days of below freezing temperatures at the beginning of the month. Two of the numerous wet weather events resulted in peak influent flows exceeding 511 MGD and total excess flow of 110 Million Gallons (MG) that received treatment through Preliminary, Primary, Disinfection, and Dechlolination treatment processes; before the flow was discharged through Outfall 001.





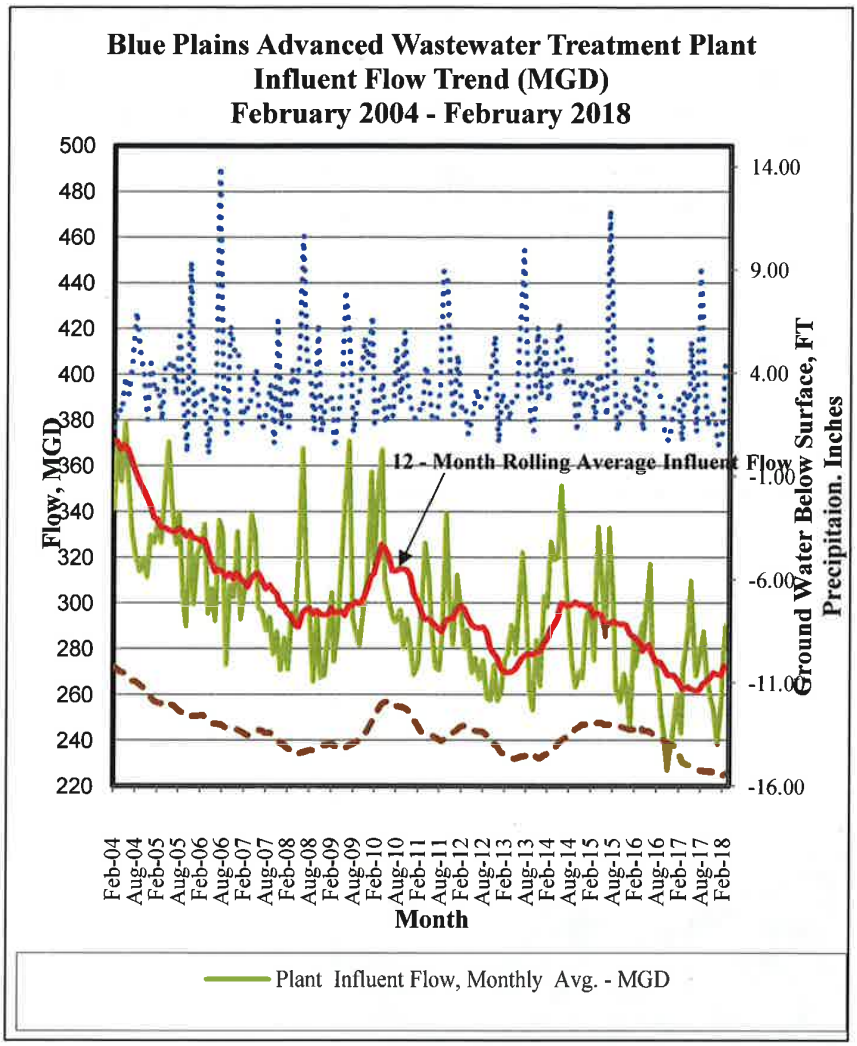
At the beginning of the month, higher than average concentrations of TSS and CBOD were measured in the effluent. They occurred immediately following the below freezing temperatures on February 2nd and 3rd and wet weather event on February 4th, that resulted in a daily average and peak influent flows of 354 MGD and 684 MGD respectively. The deicing materials, applied on roads during freezing temperatures, were washed into the treatment process during the subsequent wet weather event. This event had an adverse impact on the treatment process creating a higher level of microscale size colloidal particles with poor settling characteristics and difficult to remove in the plant's effluent filters. The colloidal particles load appears to be the source of the above average concentrations of TSS and CBOD observed in the final effluent.

The plant's operators, process engineering, and research staff worked diligently to monitor and mitigate the impact and develop control strategies for future use. As shown on the figure below, both effluent TSS and CBOD concentrations have declined to normal levels. **All effluent quality parameters were below the weekly and monthly average NPDES permit limits**.



Plant Influent Flow Trend

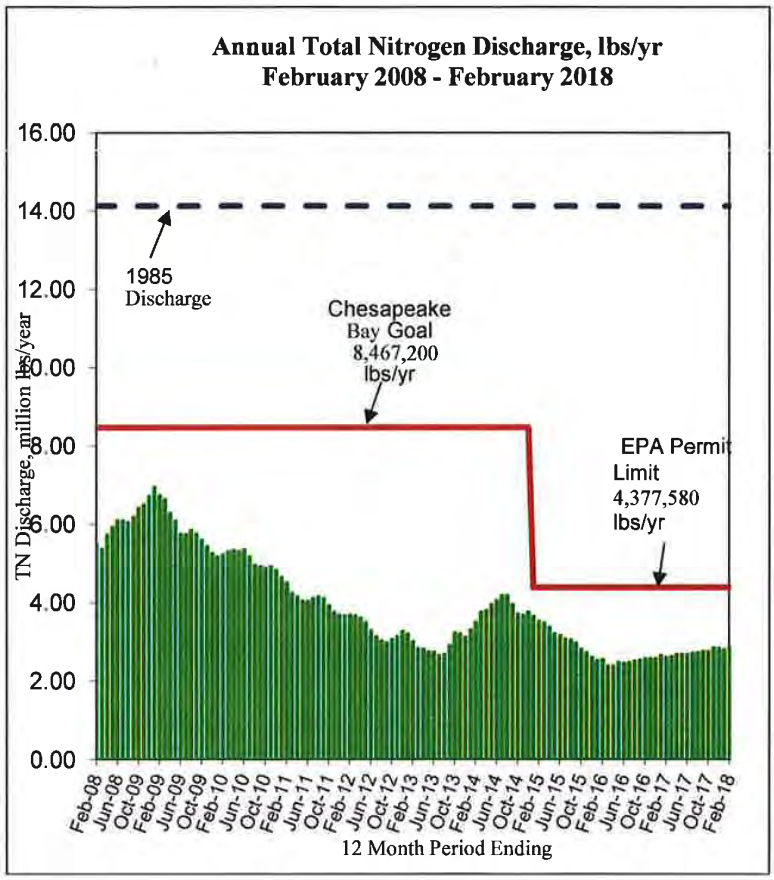
The graph below shows a long-term influent flow trend to the plant ending February 2018. While for any given month the flow is weather dependent, the 12-month rolling average influent flow has remained at or below 300 MGD since February 2011.



Blue Plains Total Nitrogen (TN) Removal – Performance

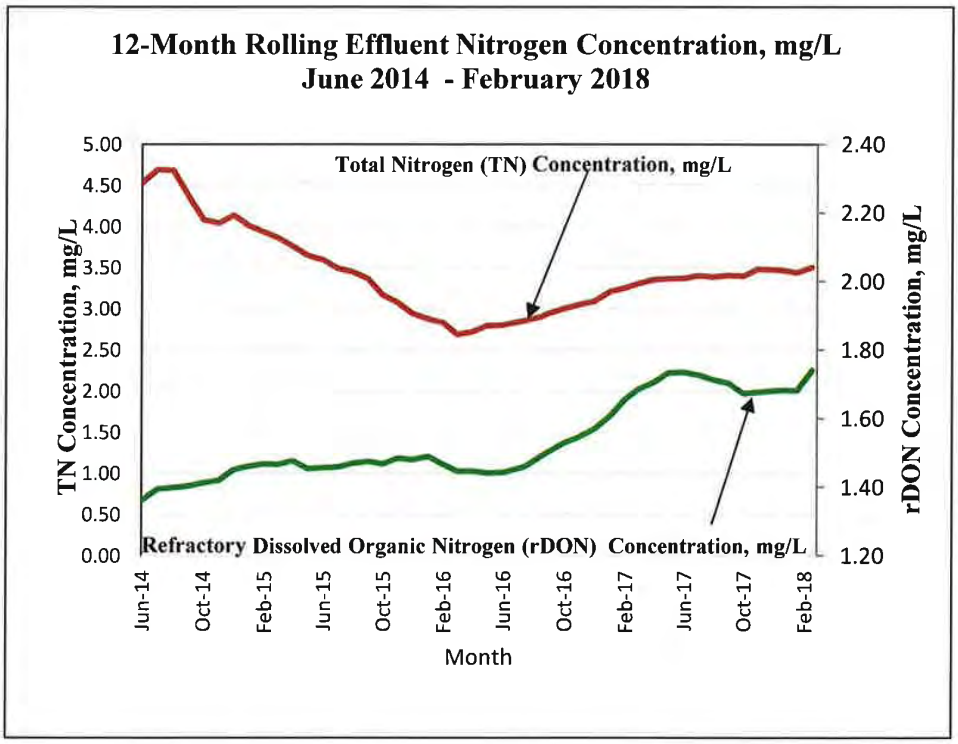
The graph below shows 12-month rolling TN discharge, in million pounds per year, over a 10-year period ending February 2018. In February 2018, the monthly average TN concentration and total load in the effluent were 4.44 mg/L and 296,600 lbs. respectively.

During the 2017 calendar year, the total pounds of nitrogen discharged in the effluent was 2,835,177 and is below the NPDES permit discharge limit of 4,377,580 lbs. /year. The performance corresponds to annual average influent flow of 269 MGD, maximum month flow of 308 MGD, and average monthly wastewater temperatures above 17 °C observed during the calendar year. The Blue Plains Enhanced Nitrogen Removal Facility (ENRF) is designed to meet the TN discharge limits at influent loads corresponding to annual average flows of 370 MGD, maximum month flows of 485 MGD, and operating wastewater temperatures below 12 °C.



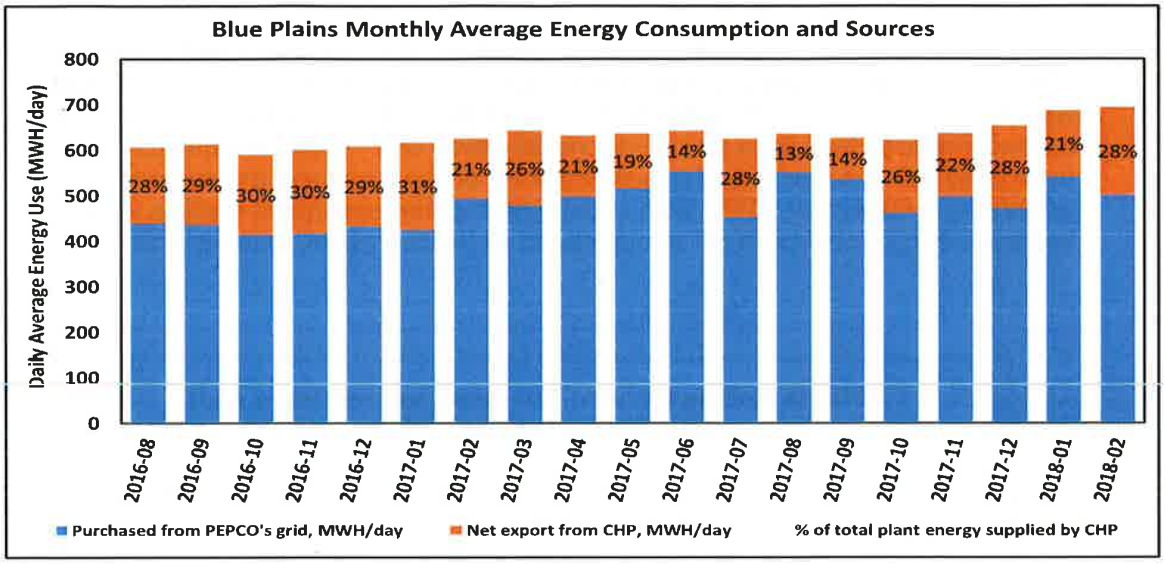
Note: Since the commissioning of ENRF, the 12-month rolling average TN concentration and load in the effluent continued to decline and reached the lowest level in March of 2016. Although the TN load in the effluent remained well below the permit limit, the slight but steady increase since March of 2016 was mostly caused by higher concentrations of refractory dissolved organic nitrogen (rDON) in the filtrate (liquid removed from dewatering class A biosolids) returned for treatment in the plant's secondary and enhanced nitrogen removal processes. The rDON concentrations are within anticipated levels and have stabilized as shown on the chart below (green line).

The monthly average TN concentrations in recent months (November and December 2017) were slightly elevated due to scheduled major outages of Nitrification Reactors. In November 2017, half of the 12 Nitrification Reactors were removed from service for six consecutive days to replace 20 inch discharge valves on 21 return sludge pumps associated with the reactors. Replacement work on the remaining six reactors was completed in December 2017. Both shutdowns and the subsequent startups were successfully completed with full compliance of all NPDES permit requirements.

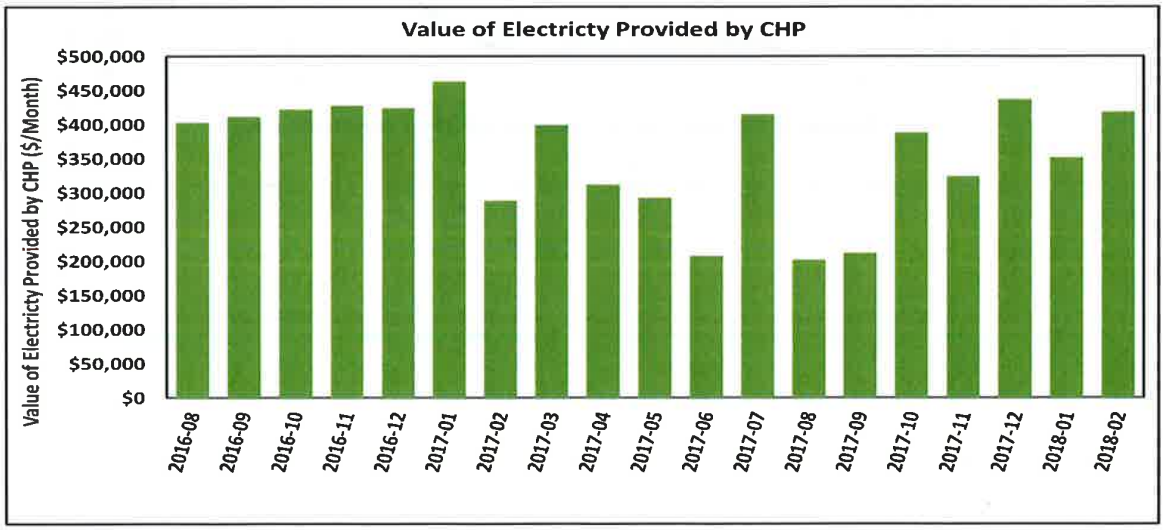


Plains Electricity Generation and Usage

In February 2018, the average energy consumed at Blue Plains was 693 megawatt hours per day (MWH/day) or 2.42 MWH of electricity per million gallon of wastewater processed through complete treatment. The Combined Heat and Power (CHP) facility generated an average of 192 MWH/day, making up for 28% of total energy consumed at Blue Plains. The remaining 501 MWH/day was purchased from PEPCO.



The graph above is based on power monitors installed at the Main Substation and CHP, and reflects average energy consumed at Blue Plains in MWH/day. Of the total use, the energy purchased from PEPCO and net energy supplied by CHP are indicated by the blue and orange highlights, respectively. The graph below shows the monthly value of the net electricity produced by CHP by assuming unit price of $78/MWH of electricity.



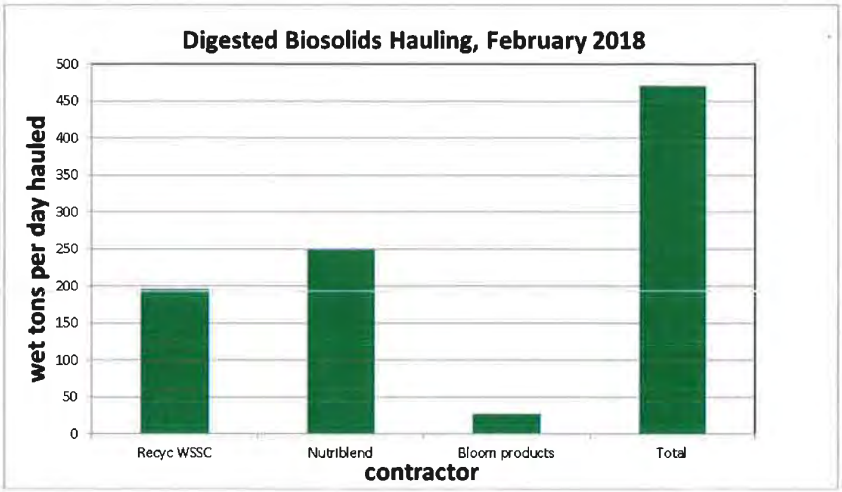
CHP Operation and Maintenance Status

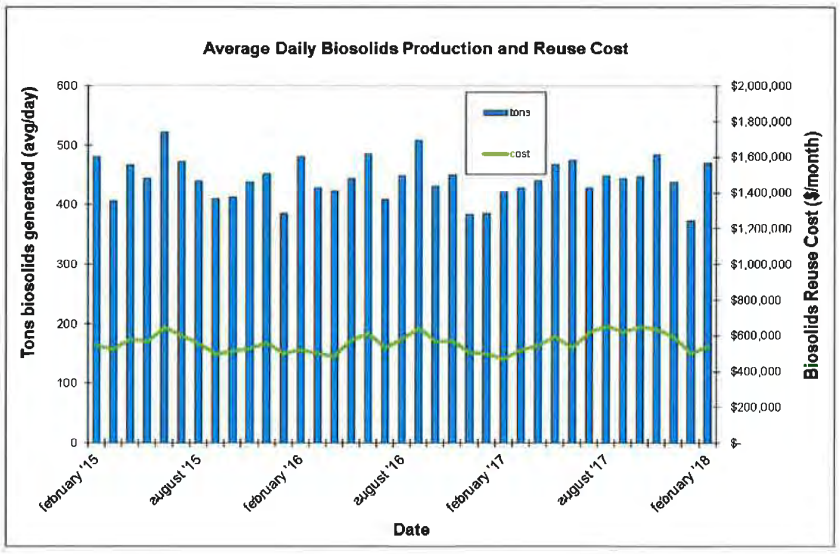
The recent repair works, completed on two of the three Heat Recovery Steam Generators (HRSG), have significantly improved the reliability of the CHP to produce and supply adequate high pressure steam to the Thermal Hydrolysis Process (THP) and maximize use of digester gas for electricity production. The average electrical energy production rate, in MWH/day, in February 2018 was the highest achieved since the beginning of the contract operation period on July 1, 2016.

The annual reconciliation of the contract operation period that ended on September 30, 2017 is still in progress. The reconciliation will include, amongst other items, reimbursement payments for any power production shortfalls under the Digester Gas Electrical Power Production Guarantee, as set forth in the contract.

RESOURCE RECOVERY

In February, biosolids hauling averaged 470 wet tons per day (wtpd). The average percent solids for the Class A material was 32.5%. The graph below shows average daily biosolids produced and the associated monthly cost for reuse (transportation and application cost) for a three-year period ending February 2017. In February, diesel prices averaged $3.29/gallon, and with the contractual fuel surcharge, the weighted average biosolids reuse cost (taking into account the marketed material) was $41.46 per wet ton.

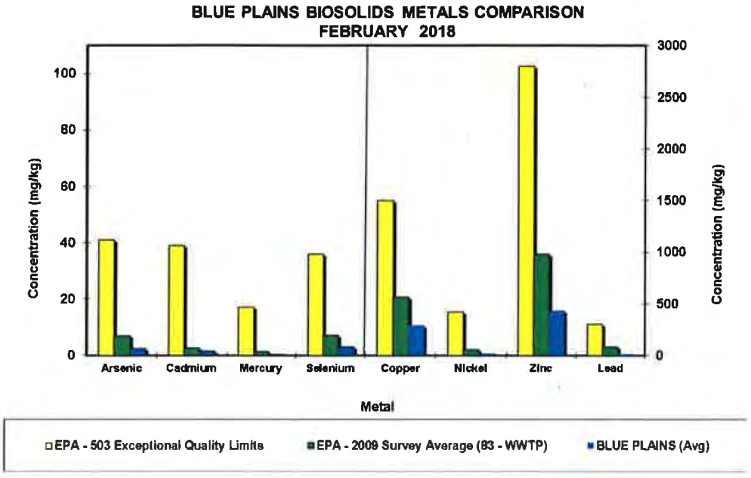




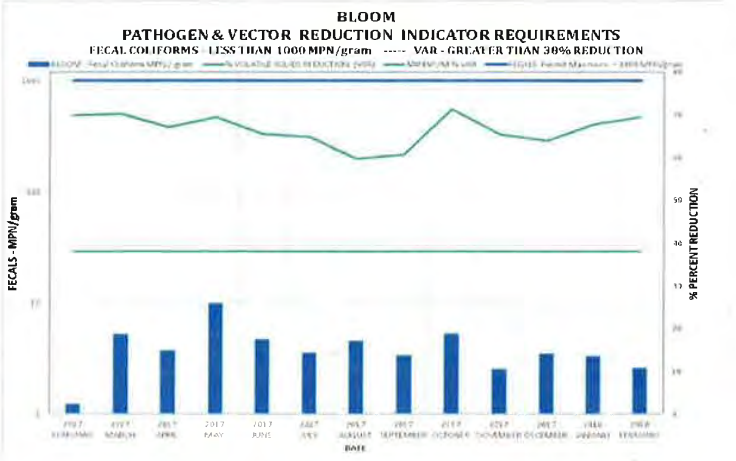
The average quanities of Class A biosolids transported and applied on farms by the two major contracts (WSSC's Recyc and DC Water's Nutriblend) and the quantites marketed as Bloom are shown on the graph above. In February, 736 wet tons of Bloom were distributed to two customers.

Product Quality

All biosolids produced during the month of February met Class A Exceptional Quality (EQ) requirements required by EPA. The graph below shows the EPA regulated heavy metals average concentrations in the Class A biosolids. The concentrations are considerably below the regulated exceptional quality limits (EPA-503 Exceptional Quality Limits) and the national average (EPA-2009 Survey Average).

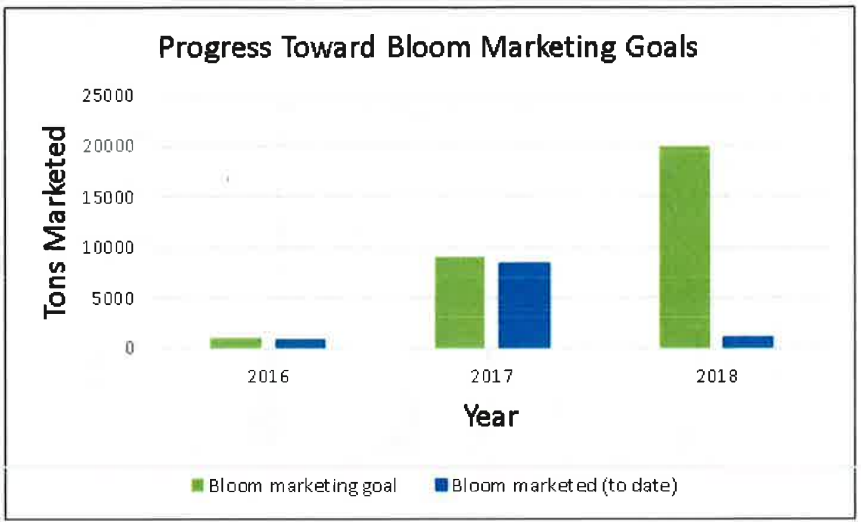


The graph below shows both Vector Attraction Reduction (VAR) and Fecal Coliform (FC) results in the Class A product, both of which are required to maintain the Class A Exceptional Quality (EQ) status. Vector Attrraction Reduction is measured by the reduction in Volatile Solids (VS) or organic compounds that may be odorous and attract nuisance vectors such as flies and rodent. DC Water anaerobic digesters reduced VS by over 65 percent, well above the required 38 percent minimum. In addition, the graph shows fecal coliforms levels in the Class A product. Fecal coliforms are indicators of disease causing organisim (pathogens), and must be below 1,000 MPN/g to meet Class A standards. The FC levels in the Class A product are two orders of magnitude less than the maximum allowable level.



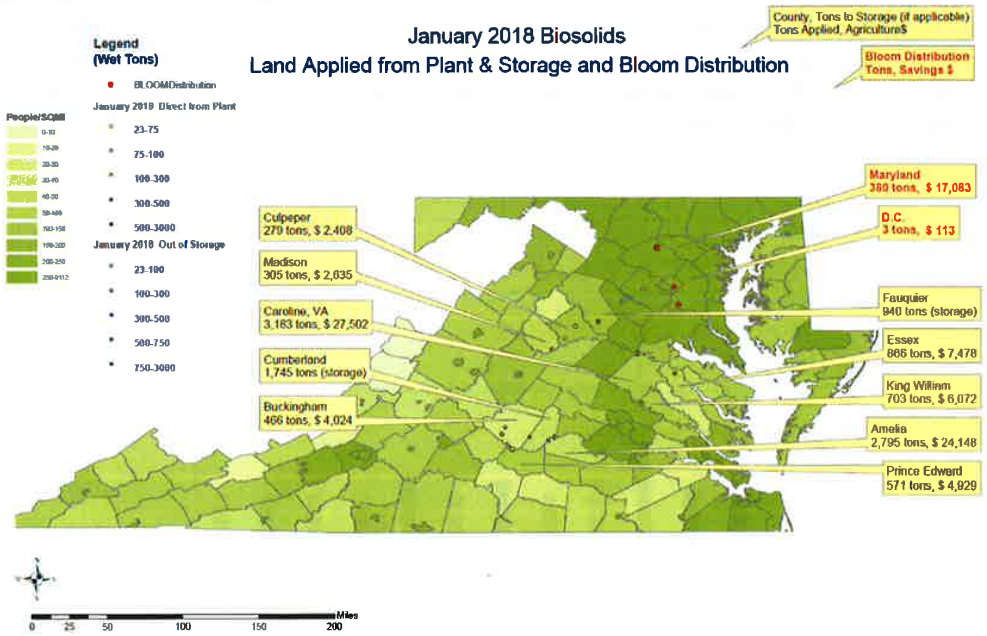
Bloom Marketing

Bloom sales for the current calendar year, through February 28th, totaled 1,119 tons and represents 6% of the 20,000 tons goal.



Bloom Reuse and Value Map

This map shows where Bloom was reused on agricultural land and sold into the market as a soil amendment product in January 2018. Marketing activates occurred exclusively in MD and DC, since this is where we have permits to do so. We just received our Distribution and Marketing permit for the state of VA, and are beginning to make sales calls in the state.



CLEAN WATER QUALITY AND TECHNOLOGY

The Department of Clean Water Quality and Technology includes the research and development, pretreatment and laboratory programs. A summary of activities for each group is provided below.

Research and Development

The research and development team focuses on research topics associated with the planning and operation of Blue Plains. The current focus of research is to optimize treatment process capacity and to work toward achieving energy neutral operations. Activities during December and January included continued work by our research team in the carbon removal/redirection, nitrogen removal, and solids treatment focus areas. In addition, members of the R&D team were involved with the activities below.

Developing a Comprehensive Plant-wide Model for Colloids Flocculation and Carbon Capture

As part of the ongoing investigation of options for optimizing Blue Plains Secondary Treatment capacity and energy balances, the research and development team started working with Dynamita to develop a model using the Sumo software to simulate carbon capture in high rate biological treatment systems. Although biological process models have been used in the wastewater treatment industry for many years, most of the development effort has been focused on nitrogen removal systems operating at solids retention times (SRT, or sludge age) longer than three days. As a result, the available process models are less accurate for simulating performance of high-rate secondary treatment processes. Alternatives for enhancing the Blue Plains secondary treatment capacity require operation at lower SRT, and a modeling tool is needed to properly assess these options.

In the existing process models, organic material in the wastewater is quantified as chemical oxygen demand (COD). The COD is classified into various "fractions" based on the size of the organic compounds (i.e. soluble COD, colloidal COD and particulate COD) and the biodegradability (i.e. biodegradable and un-biodegradable). Within the models, the colloidal COD is first quickly flocculated and converted to particulate COD. This flocculation rate occurs almost instantly and is therefore considered "non-limiting" from the perspective of affecting the overall treatment rates. Particulate COD is converted to easily degradable organics (soluble COD) via a process called hydrolysis. Soluble COD is biologically oxidized and converted to energy and new biomass.

However, in high-rate systems that are designed to reduce the energy for oxidizing COD and improve capture of COD for energy recovery, the flocculation of particulate and colloidal COD cannot be assumed to occur instantaneously and the mechanisms and time for this step must be accounted for within the model. The flocculation process is dependent on biological activity and the ability of the organisms to stick together and form flocs by producing natural polymers called EPS (or extracellular polymeric substances). In addition, under high rate conditions, organisms can store soluble

substrate before they are able to oxidize it. A structure for updating the existing models to account for colloidal material and extra polymeric substrate "EPS" generation, flocculation of colloidal and particulate material, and internal storage in microbial cells is shown in Figure 1.

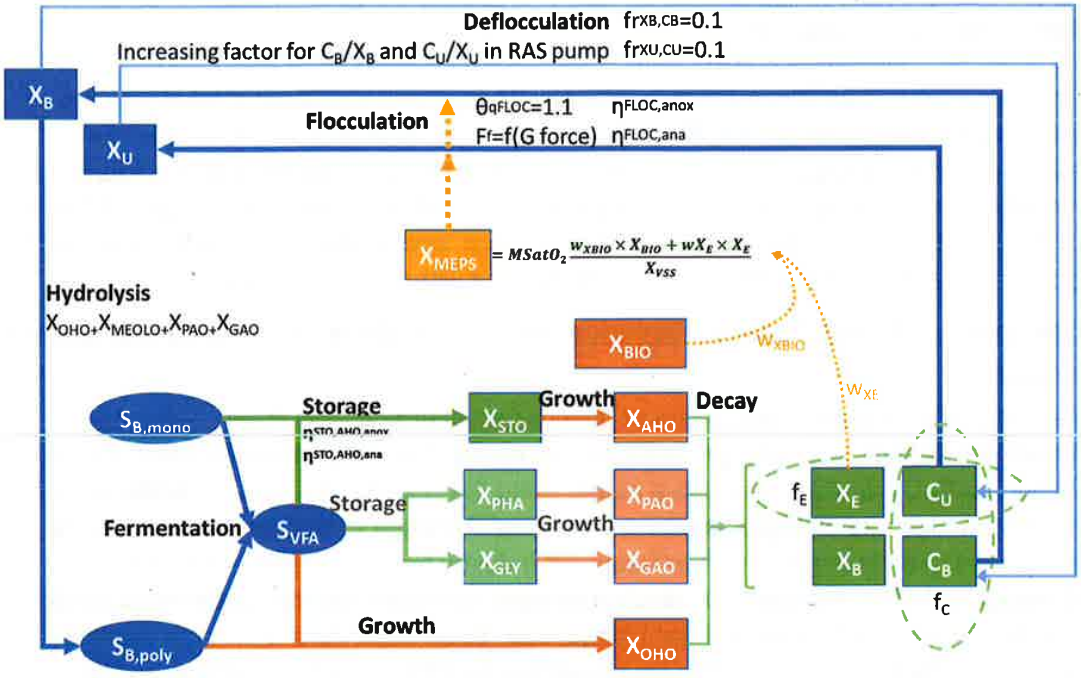


Figure 1. Biological processes added and modified for the removal and capture of organics. [SB,mono = monomer soluble biodegradable COD; SB,poly = polymer soluble biodegradable COD; SVFA = Volatile Fatty Acids; XSTO = Storage particulate COD; XMEPS = Specific EPS content; XE = Endogenous particulate COD; XB = Biodegradable particulate COD; XU = Un-biodegradable particulate COD; CB = Biodegradable colloidal COD; CU = Un-biodegradable colloidal COD]

The model will be tested using data from various pilot and full scale processes with wide range of wastewater characteristics, process configurations, and operational conditions. The model will then be incorporated into the plant-wide mechanistic model for Blue Plains for use in developing strategies for operating the secondary system to increase capacity and improve the energy balance to reduce cost of operation.

AVN Controller Prototype Testing – Phase 2

DC Water is working to develop a standalone controller for application of the AvN control strategy for optimization of nitrogen removal processes. With the assistance of Gray Matter Systems, a prototype controller was developed and tested at Blue Plains. A second stage of demonstration testing was initiated in January at the short-cut nitrogen

removal pilot plant being operated by Hampton Roads Sanitation District. Testing will continue over the next month using remote access, and full documentation of the controller strategy will be completed.

Blue Plains Main Laboratory

The Main Laboratory staff conducts analyses on Blue Plains AWTP effluent for NPDES Permit requirements, as well as on biosolids, pretreatment samples, storm water runoff, and process samples, on a daily basis, 365 days a year. The laboratory currently analyzes approximately 2,800 samples each month and conducts approximately 8,000 analyses, including Total Suspended Solids; Volatile Suspended Solids; Total and Volatile Solids; Ammonia Nitrogen; Nitrite and Nitrate Nitrogen; Total, Soluble, and Ortho Phosphorus; Total and Soluble Kjeldahl Nitrogen; Carbonaceous Biochemical Oxygen Demand; Chemical Oxygen Demand; Total Alkalinity and Hardness; and Fecal Coliform and E. Coli microbiological testing.

In addition to comprehensive testing to support operation of liquid stream processes, the laboratory analyzes Belt Filter Press cake samples for fecal coliform bacteria for DC Water's Class A Biosolids reporting, as well as digester samples from the new Cambi Thermal Hydrolysis and Anaerobic Digestion facility, including Total and Volatile Solids, Total and Volatile Suspended Solids, Ammonia Nitrogen, alkalinity and pH. Fecal coliforms in the BFP dewatered cake and TS and VS upstream and downstream of the digestion process are monitored to show compliance with 40 CFR 503 Pathogen and Vector Attraction Reduction requirements.

The laboratory also assisted the Department of Sewer Services conducting microbiological analysis of water samples for E. coli bacteria, as well as monitoring the Northeast Boundary Swirl Facility Effluent for NPDES compliance. Laboratory staff also participated in the WWOA Executive Board.

This month the laboratory continued analysis of samples from the new Filtrate Treatment Facility which removes nitrogen from the belt press dewatering filtrate. Parameters analyzed include ammonia, nitrate, and nitrite nitrogen; ortho-phosphorus; COD; TSS; VSS and alkalinity.

Water Quality & Pretreatment

The Blue Plains Water Quality & Pretreatment group manages the Industrial Pretreatment Program, including temporary dewatering dischargers from construction and other activities, as well as the Hauled Waste Program. A new program for Dental Dischargers is being implemented as new regulations were finalized requiring compliance with reporting and best management practices as well as installation of an amalgam separator, for those dental facilities placing or removing dental amalgam fillings. Staff also provide specialized sampling and program management support for the Blue Plains NPDES permit, including PCB monitoring and storm water management.

Staff, with contractor support, is currently updating the Blue Plains Storm Water Pollution Prevention Plan (SWPPP), conducting inspections of storm water structures and facilitating cleaning and repairs, as well as coordinating quarterly Blue Plains Storm Water Committee meetings and other SWPPP compliance activities. Staff also developed a sampling plan this month to provide a preliminary assessment of loadings from selected locations in the collection system.

Industrial Pretreatment Program

DC Water currently manages twelve (12) Significant Industrial User (SIU) and eighteen (18) Non-Significant Industrial User (NSIU) wastewater discharge permits. DC Water reviewed semi-annual monitoring reports for all SIUs this month as well as monthly self-compliance monitoring reports for six (6) SIUs and one NSIU. All SIUs and NSIUs are in compliance with discharge standards for the current month.

Enforcement-related activities included the following:

- The Naval Research Laboratory (NRL) continued to comply with their Administrative Order for the PCB violation, including submittal of follow-up monthly monitoring and a monthly progress report.

- A Notice of Violation (NOV) was issued this month to the Bureau of Engraving and Printing for a petroleum oil and grease violation of 206 mg/L at outfall 14 on November 7, 2017. Follow-up monitoring demonstrated compliance with the discharge limit of 100 mg/L. Since the monitoring was not required in their permit, the facility was not determined to be in Significant Non-Compliance (SNC).

- A NOV was issued this month to the Capitol Power Plant for a pH violation at outfall 001 on January 16, 2018. The pH was below 5.0 for four minutes, with a minimum pH of 4.5.

DC Water began preparing the annual Pretreatment Program report to EPA this month. Two SIUs were determined to be in SNC for 2017: NRL and the Naval Support Facility Carderock. These facilities will be published in The Washington Post next month.

DC Water currently manages 71 Temporary Discharge Authorization (TDA) permits, primarily for construction site discharges of groundwater and/or surface runoff in the combined sewer area. Four new TDA permits were issued this month. All TDA permits are currently in compliance with discharge standards.

Hauled Waste Program

As of the end of the current month, the hauled waste program had 31 permitted haulers authorized to discharge domestic septage, portable toilet waste, grease trap waste, groundwater or surface runoff, and other types of waste, if approved in advance and have been characterized and meet pretreatment standards. Staff renewed three hauled waste permits this month under the old fee structure. Hauled waste permits, effective after February 1, 2018, are being issued under the new volumetric fee structure.

DC Water received 1,064 hauled waste loads (2,312,101 gallons) from permitted haulers this month. Manifest forms from each truck entering the plant are collected by the security guards and picked up daily by Pretreatment staff. Data is entered into an Excel spreadsheet to track the volume and type of loads being discharged daily and the results of sampling. Staff are using the new access database developed by Process Engineering to enter hauled waste loads and will be able to sort and analyze data to easily determine monthly volumes for each type of waste received and to provide volumes for billing for those haulers subject to the new fee structure. Two hauled waste samples were collected this month to check compliance with discharge standards.

NPDES Permit Sampling

Staff collected the bimonthly effluent metals, including low level mercury, at outfall 002 this month.

Status Report of Public Fire Hydrants for DC Water Services Committee - March 5, 2018

	December Cmte. Report (Dec 04, 2017)	January Cmte. Report (Jan 02, 2018)	February Cmte. Report (Feb 01, 2018)	March Cmte. Report (Mar 05, 2018)
Public Fire Hydrants:	9,548	9,547	9,547	9,548
In Service:	9,501	9,502	9,509	9,497
(OOS)	47	45	38	51
OOS - defective requiring repair/replacement	29	26	19	22
% OOS requiring repair or replacement (DC Water goal is 1% or less OOS)	**0.30%**	**0.27%**	**0.20%**	**0.23%**
OOS - due to inaccessibility or temp construction work	18	19	19	29

Note: The number of public hydrants in the DC Water system fluctuates; this number fluctuates as hydrants are added and removed during development or construction activities as well as at the request of the Fire Dept.

Breakdown of Public Fire Hydrants Out-of-Service (OOS) as of March 5, 2018 51

Breakdown of Defective

	0-7 Days	8-14 Days	15-30 Days	31-60 Days	61-90 Days	91-120 Days	> 120 Days	Total
Hydrant Needs Repair/Investigation	0	1	1	0	0	0	3	5
Needs Valve Investigation for Low Flow/Pressure or Shut Test for Replacement	0	0	0	0	0	1	2	3
Needs Replacement	0	2	1	2	0	2	7	14
Defective								**22**

Breakdown of Others

	0-7 Days	8-14 Days	15-30 Days	31-60 Days	61-90 Days	91-120 Days	> 120 Days	Total
Temporarily OOS as part of operations such as a main repair	0	2	7	0	0	1	7	17
Construction* - OOS	0	0	1	2	1	1	3	8
Obstructed Hydrant – OOS hydrant due to operation impeded by an obstruction.	0	0	0	0	0	0	4	4
Others								**29**

**Fire hydrants not accessible due to construction activities. Also includes new hydrants which have not yet been commissioned or old hydrants which will be abandoned as part of ongoing construction projects.*

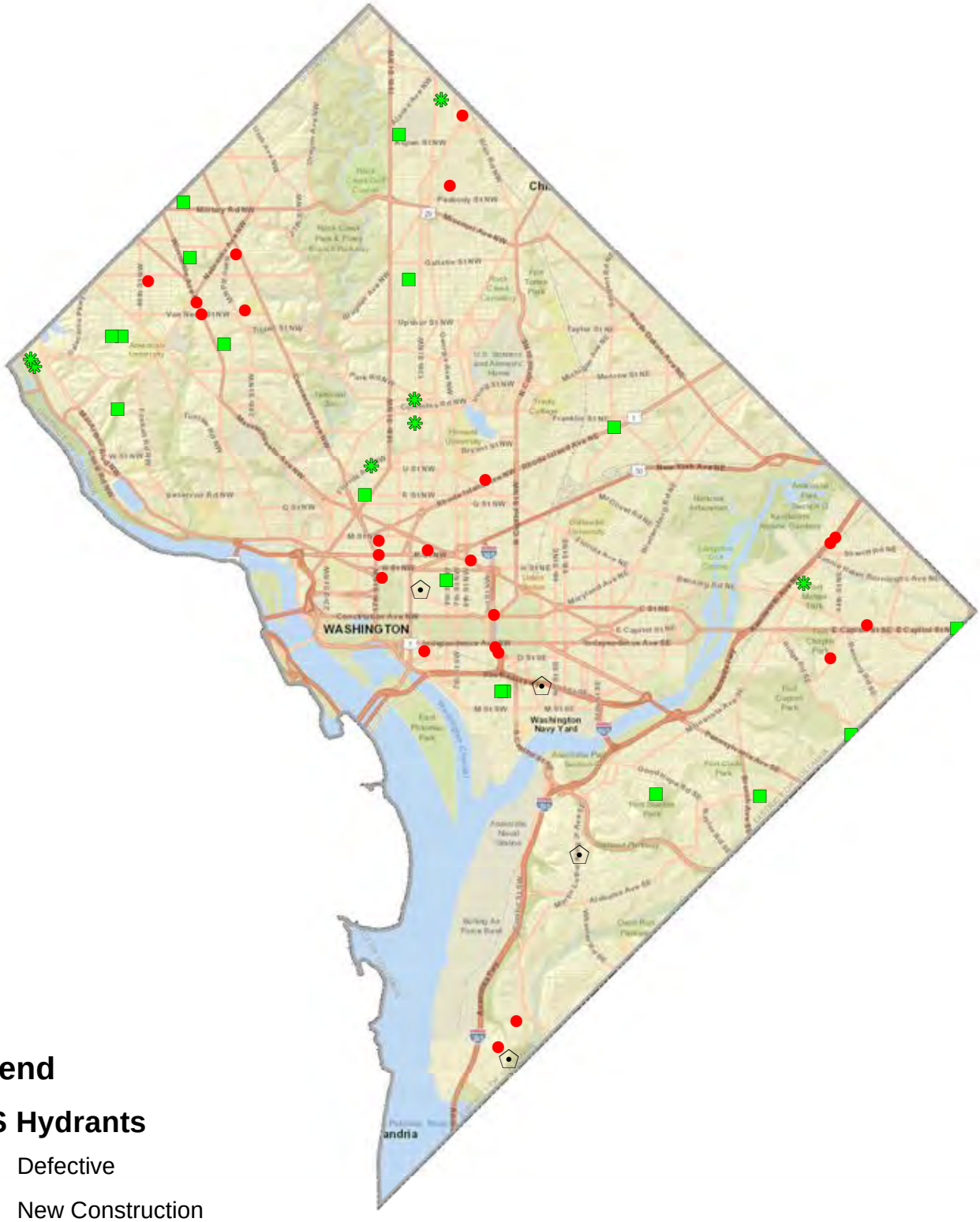
Status of Private Fire Hydrants-Based on FEMS Inspection Reporting

Private Hydrants: 1,318

- **In Service: 1,179**
- **Out-of-Service (OOS): 139**

Map of Public Out-of-Service Hydrants

March 5, 2018



Legend

OOS Hydrants

- Defective
- New Construction
- Obstructed
- Temporary