

# 2020 Watershed Update

## Agenda...

Wednesday, February 26, 2020

Municipality of Anchorage

Alaska Department of Transportation and Public Facilities

At the BP Energy Center, Birch Room

900 E. Benson Blvd.

The Municipality of Anchorage and Alaska Department of Transportation and Public Facilities  
Invite you to the 2020 APDES Watershed Update Highlighting  
Anchorage Storm Water Permit Compliance Activities

**Welcome** Municipality of Anchorage and Alaska Department of Transportation

*Doors open and Refreshments available starting at 9:00 a.m.*

### Program

9:15 APDES Storm Water Program

- Introductions
- Agency Updates

9:40 Current Issues and Activities

- Brewery By-product Storage and Disposal
- DCM Implementation and Changes to Landscape Code
- Type II SWPPPs
- Storm System Master Planning and Condition Assessment

10:15 Poster Session of Projects from 2019 and 3<sup>rd</sup> Term

10:40 Breakout Session

Essential Elements of the MSGP

***Birch Room***

Presented by: William Ashton, ADEC

*Or*

Campbell Creek Watershed Plan Scope

***Aspen Room***

Presented by: Cherie Northon, AWC

11:30 Discussion and Adjournment – Project Team

*We're pleased to have you join us for all or a portion of the 2020 Watershed Update*

*You can find additional information on the stormwater permit at [anchoragestormwater.com](http://anchoragestormwater.com)*











# *2020 Watershed Update*

**Municipality of Anchorage  
Alaska Department of Transportation  
and Public Facilities**

*A.laska  
P.ollutant  
D.ischarge  
E.limination  
S.ystem*

# Today's Agenda

## APDES Meeting Agenda:

### **BIRCH Room**

**9:15 APDES Storm Water Program**

- Introductions
- Agency Updates

**9:40 Current Issues and Activities**

- Brewery By-product Storage and Disposal
- DCM Implementation & Changes to Landscape Code
- Type II SWPPPs
- Storm System Master Planning and Conditions Assessment

**10:15 Poster Session of Projects from 2019 & 3<sup>rd</sup> Term**

**10:40 Essential Elements of the MSGP**

**11:30 Discussion & Adjournment – Project Team**

### **ASPEN Room**

**10:40 Campbell Creek  
Watershed Plan  
Scope**



# *APDES Annual Meeting*



## Municipality of Anchorage and Alaska Department of Transportation and Public Facilities



## Agency Updates and Current Issues

# *APDES Annual Meeting*



Municipality of Anchorage  
and Alaska Department of Transportation  
and Public Facilities



## Anchorage Storm Water Permit Compliance

- \*APDES = Alaska Pollutant Discharge Elimination System
- \*MS4 = Municipal Separate Storm Sewer System

# *APDES Annual Meeting*

## Permit:

Term 3: August 1<sup>st</sup> 2015 – July 31<sup>st</sup> 2019

Term 4: Begins August 1<sup>st</sup> 2020

\*Term 4 Permit Application currently under development

## Permit Programs

- ✓ Illicit and Industrial Discharge
- ✓ Infrastructure and Street Management
- ✓ Construction
- ✓ New Development
- ✓ Public Education
- ✓ Monitoring

# *APDES Annual Meeting*

## Brewery By-product Storage and Disposal

Presented by:

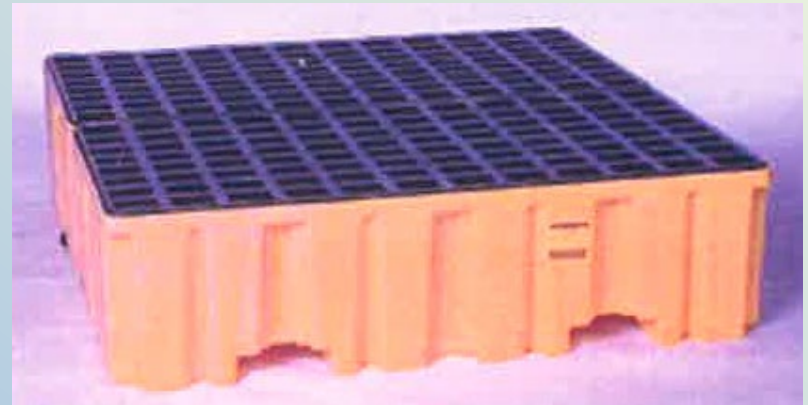
Kyle Cunningham  
MOA Environmental Specialist

# Brewery By-product Storage and Disposal



## Best Management Practices

- ✓ Covered outdoor storage
- ✓ Replace leaky containers
- ✓ Remove direct Storm Drain connections
- ✓ Stage containers on permeable ground (gravel or vegetated area)
- ✓ Spill kit on hand and nearby



# Brewery By-product Storage and Disposal

By-products stored in bags and/or under cover



Secondary containment system for leak prevention/leaky totes

Cap or solid lid for Storm Drain inlets

*APDES Annual Meeting*

## DCM Implementation and Changes to Landscape Code

Presented by:

Jeffrey Urbanus  
MOA Watershed Hydrologist

# *DCM Implementation and Title 21 Landscaping Requirements*

## **WMS and MOA Planning have been working to integrate existing Green Infrastructure and Landscaping Requirements**

- DCM vs Title 21
- Looking for ways to minimize the impact of mandated design elements
  - Meeting two requirements within the same footprint.
  - Take advantage of the recording requirements of Stormwater BMPs
  - Allow for expanded use of native vegetation for landscaping
    - Less site impact and less soil disturbance and compaction
    - Less money spent on design and site prep.
  - Honor the intent of the landscaping requirements.



# *DCM Implementation and Title 21 Landscaping Requirements*



Taku Lake  
Rain Garden

# *DCM Implementation and Title 21 Landscaping Requirements*

## **Progress to Date**

- Identification of a mechanism to allow this to happen:  
Alternate Equivalent Compliance section of Title 21
  - More of a focus on performance and intent vs. prescriptive elements
- Code Change to Title 21.
  - Allow for expanded use of natural vegetation.

# *DCM Implementation and Title 21 Landscaping Requirements*

## **Next Steps**

- Additional guidance for designers and reviewers
- Intend to stay with a non-prescriptive approach
  - Recommended Plant Species
  - Recommended Best Practices and Techniques
- Completed in the next couple of months

# *APDES Annual Meeting*

## Type II SWPPPs

Presented by:

Kristi Bischofberger  
MOA Watershed Manager

# Type II SWPPPs

## Type 2 SWPPPs -

- ASM Volume II is being revised to include Owners Statement for Type 1 SWPPPs & add Appendix B reference
- Appendix C is being revised to be consistent with ASM Volume II requirements

## 2.0 CONSTRUCTION SUBMITTAL REQUIREMENTS

Required construction-related submittals vary depending on the size and scope of each project. Below is a list and brief description of the types of submittals that may be required.

### 2.1 Types of Submittals

1. *Stormwater Threat Assessment Form*. This form (provided in Appendix A) is required for all projects. This flowchart considers various factors that may deem a site environmentally sensitive and require increased MOA inspections.
2. *Owner's Statement* – This is required for all projects. See Appendix B for Type 1 SWPPPs, or Appendix C for Type 2 and 3 SWPPPs.
3. *Stormwater Pollution Prevention Plan (SWPPP)* - Some form of SWPPP is required for most projects within the MOA. Refer to Section 3 and Table 2.1-1 to determine what type of SWPPP is required for your project.
4. *Notice of Intent (NOI) for the CGP* - This is required only for projects that are required to submit a Type 3 SWPPP. A Type III SWPPP is required for projects that collectively disturb one or more acres of ground. Project categories assume that projects are not part of a common plan of development. For projects that are part of a larger plan of development, the area must consider the entire collective project. Refer to Section 3.6 for additional information.
5. *Dewatering Plan* - This is required for projects that will be pumping to dewater an area for construction activities.
6. *Other Information* -- Some select sites are required to submit additional information as required by state, local, and federal law or as requested by the MOA such as a **Multisector General Permit SWPPP**, Spill Prevention and Countermeasure Control (SPCC) plans, or other relevant permits such as wetland fill permits. Information regarding SPCC plans is provided in Section 4. If you have questions regarding the applicability of other submittals to your project, please contact the MOA.

Table 2.1-1 summarizes these requirements, and specific details are provided in subsequent sections.

### 2.2 Submittal Address

The MOA address for submittals is provided below.

Municipality of Anchorage  
 Department of Public Works, Project Management and Engineering  
 Watershed Management Services  
 4700 South Elmore Road (physical location)  
 P.O. Box 196650 (mailing address)  
 Anchorage, Alaska 99519-6650

Type 2 and 3 SWPPP Completeness Checklist

Identifying Information		Type 2 SWPPP	Type 3 SWPPP
<b>Project (2.2.3)</b>			
	Have you included project name, site location/address, city, state, zip code, and phone number (if appropriate)?		
<b>Operator(s) (2.2.3)</b>			
	Are there multiple operators on this permit?		
	If YES, have you included company/organization name, contact person, address, (including city, state, and zip code), and telephone/fax/email contact information?		
	Have you included the above information for the		
	contact person for SWPPP questions : company/organization name, contact city, state, and zip code), contact information?		
	date the SWPPP was prepared		
	(estimated) start and completion of /YYYY)?		
	ization Number?	Not Req	
	SWPPP been documented on the endments?		
	ation/Delegation form been dated, and signed by a Responsible		Req
<b>Section 1 - General information</b>			
	Operator(s)/Contractor(s) for the ess, contact information, and area of		Req
	Subcontractor(s) for the project, tact information, and area of nsibility?		Req

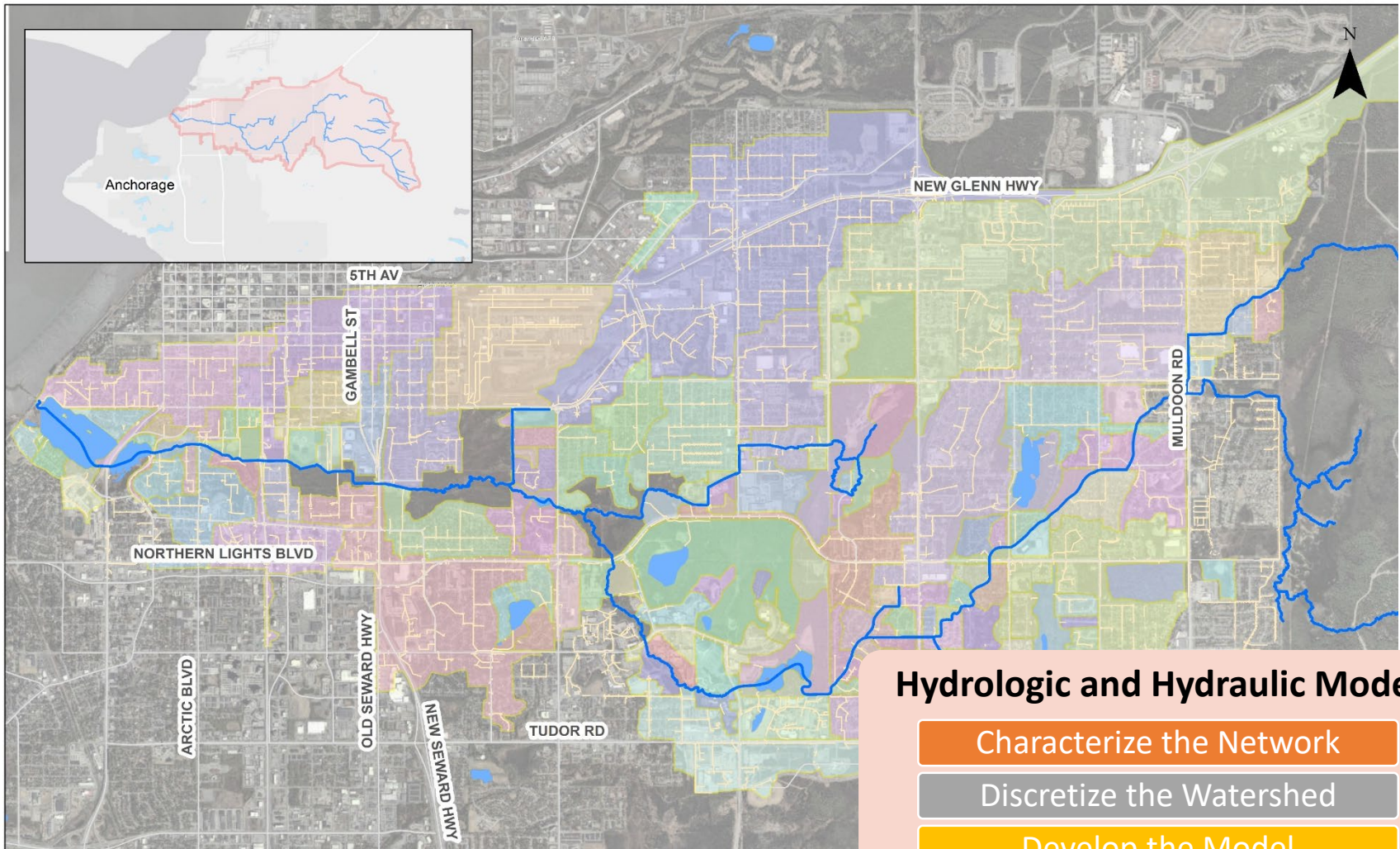
*APDES Annual Meeting*

# Storm System Master Planning and Condition Assessment

Presented by:

Janie Dusel  
AWR Engineering

# Chester Creek Watershed Stormwater Master Plan



# APDES Annual Meeting

## Poster Session

- Wet Weather Monitoring
- Dry Weather Monitoring
- Pesticide Monitoring
- LID Project Monitoring
- WMS Mapping
- Construction Erosion & Sediment Control
- Stormwater BMPs

*Return at 10:40*

WMS Survey  
Annual Meeting, February 27, 2019

We appreciate your feedback.  
Please rate this training and let us know how we can improve it.

What is your background?

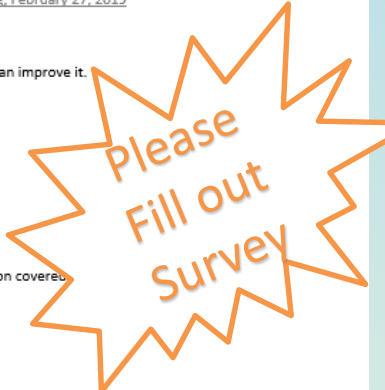
- Community Member - Unaffiliated
- Engineering Professional
- Environmental Professional
- Manager/Public Official
- Other

How would you describe the amount of information covered?

- Much too much
- Right amount
- Somewhat too little
- Much too little

Overall, how satisfied were you with the meeting/training?

1 2 3 4 5 6 7 8 9 10  
Lowest Highest



[www.AnchorageStormwater.com](http://www.AnchorageStormwater.com)

WMS Plan Review Map | Watershed Management

anchoragestormwater.com

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### Watershed Management

HOME | PROGRAMS | MAPS | DOCU

#### Announcements

**DCM Chapter 2: Anchorage Stormwater Manual-Final Version**

The Municipality of Anchorage has adopted changes to Chapter 2 (Drainage) of the Design Criteria Manual.

These revisions are in the form of a two-volume Anchorage Stormwater Manual:

- Volume 1: Management and Design Criteria
- Volume 2: Construction Practices

**2018 Annual Meeting**

The 2018 APDES Annual Meeting was held on March 8th at the BP Energy Center. A preliminary agenda was sent to last year's attendees. A copy can be viewed here.

#### WELCOME

The Municipality of Anchorage Watershed Management Services works to protect and improve the quality of all Anchorage's streams and waterways in order to comply with federal and state regulations, specifically the Alaska Pollution Discharge Elimination System (APDES).

#### Our Watershed

The creeks, streams, wetlands, and other waters within the Municipality of Anchorage give our city much of its unique character. This network of waterways supports not only fish, wildlife, and natural habitats, but also businesses, neighborhoods, and the health of our community, improving our quality of life.

#### Stormwater and Water Quality

As Anchorage grows, development can disrupt and permanently alter natural water conditions and functions through clearing, altering topography (flattening hills, filling low lands), compacting soil, and building parking lots, roads, and driveways. As Anchorage is developed, more stormwater flows directly into creeks and waterways, rather than being filtered through the soil. This runoff accumulates pollutants (car oil, grease, pesticides, detergents, etc.) that flow directly into the streams and waterway. The change in stormwater volumes and timing can also cause higher than natural rates of erosion along stream banks and streambeds.

Many people believe that stormwater is clean and does not harm water quality.



# *2019 Watershed Update*

**Municipality of Anchorage  
Alaska Department of Transportation  
and Public Facilities**

*A.laska  
P.ollutant  
D.ischarge  
E.limination  
S.ystem*

# *Illicit Discharge*

## AMC 21.07.040 – Regulates Discharges to MOA storm drains

- Defines specific prohibited discharges, but also defines “illicit discharge” as “pollutants or any materials other than storm water”.
- Streets drain to creeks - #1 public outreach message
- All drains are not equal - Storm drain flows DO NOT go to the sewage treatment plant



# *Illicit Discharge*



# *Illicit Discharge*

Free Disposal for Household Hazardous Waste



## **Not sure what to do with that leftover household hazardous waste?**

The Anchorage Regional Landfill and the Central Transfer Station accept up to 5 gallons (40 pounds) of household hazardous waste, paint, turpentine, aerosols, poisons, antifreeze, oil, etc. for **FREE!!!**

### **Anchorage Regional Landfill**

**Glenn Highway & Hiland Road Interchange**

**Tues – Sat 8 am – 5 pm**

Provided by the Municipal  
Watershed Management Program

**428-1742**

### **Central Transfer Station**

**Old Seward & E. 54th Avenue**

**Tues, Thurs, Sat 8 am – 5 pm**

**343-6262**

# Spill Cleanup



WMS Plan Review Map x Watershed Management - | x

anchoragestormwater.com

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## Watershed Management

HOME PROGRAMS MAPS DOCUMENTS CONTACT

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HOW DO I?

#### LINKS

- [ADEC NOI Portal](#)
- [Documents](#)
- [Rain Garden Program](#)
- [Find Staff](#)

# www.AnchorageStormwater.com/maps

The screenshot shows a web browser window with the URL [anchoragestormwater.com/maps.html](http://anchoragestormwater.com/maps.html). The page features a navigation menu with links for HOME, PROGRAMS, MAPS, DOCUMENTS, and CONTACT. The main content area is titled "Watershed Management Map Gallery" and includes a search bar for maps. A grid of six map thumbnails is displayed, each with a caption: "Proposed Stream Setbacks", "Municipal Drainage ...", "MOA Wetlands Mapping", "MOA Wetland Atlas Index", "Green Infrastructure ...", and "Floodplain Mapping". To the right of the map gallery is a sidebar titled "Map Gallery" with a welcome message and a link for "more details".

WMS Plan Review Map x Watershed Management - | x

anchoragestormwater.com/maps.html

Apps For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now... Other bookmarks

## Watershed Management

HOME PROGRAMS MAPS DOCUMENTS CONTACT

### Watershed Management Map Gallery

This gallery is intended to provide Anchorage residents, businesses and visitors with access to municipal watershed mapping data.

Search maps

- Proposed Stream Setbacks
- Municipal Drainage ...
- MOA Wetlands Mapping
- MOA Wetland Atlas Index
- Green Infrastructure ...
- Floodplain Mapping

#### Map Gallery

Welcome to the Municipality of Anchorage's Watershed Management Map Gallery. The Watershed Management group maintains a database of hydrographic spatial data and it is organized here to help you quickly and easily access and interact with the data. Source data for the majority of content displayed here is the Watershed Management's Hydrography Geodatabase (HGDB).

[more details](#)

# www.AnchorageStormwater.com/maps

The screenshot displays the MOA Drainage Viewer web application. The browser address bar shows the URL: [moapw.maps.arcgis.com/apps/View/index.html?appid=c9dbd7c294b3461cb902d2c6124e29a9](http://moapw.maps.arcgis.com/apps/View/index.html?appid=c9dbd7c294b3461cb902d2c6124e29a9). The application title is "MOA Drainage Viewer".

The map shows an aerial view of a city area with a network of drainage lines and nodes overlaid. The nodes are represented by various symbols and colors, including yellow circles, red squares, blue diamonds, and blue circles. The drainage lines are shown as black and yellow lines.

The legend on the right side of the map is titled "MOA Drainageways and Drainageway Nodes" and lists the following symbols and their corresponding features:

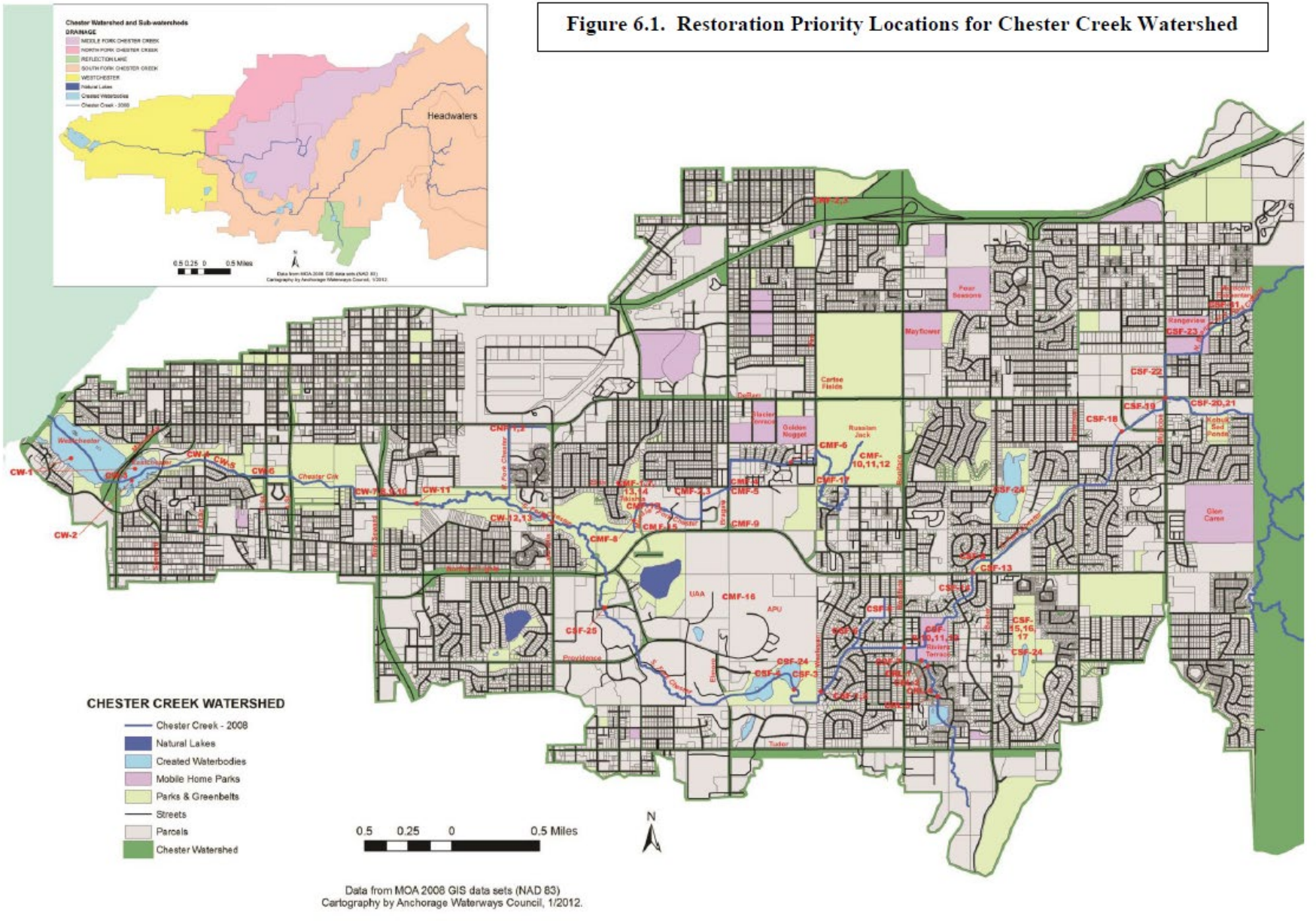
- Manhole
- Catchbasin Manhole
- Clean-Out
- Catch Basin
- OGS
- Lift Station
- Diverter
- Drywell
- Weir
- Blind Connect
- Top Intake Manhole
- Roof Drain

The interface also includes a search bar at the top left with the text "Find address or place" and a scale bar at the bottom left showing 0, 200, and 400 feet. The bottom of the page features the Esri logo and the text "POWERED BY esri Municipality of Anchorage, DigitalGlobe, Fed GIS, GeoEye, Microsoft".



# Chester Creek Restoration Priorities

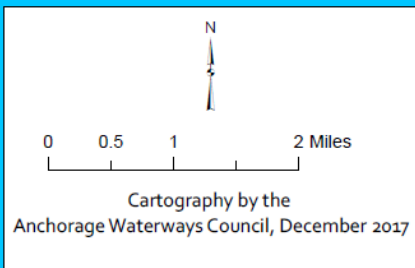
Figure 6.1. Restoration Priority Locations for Chester Creek Watershed



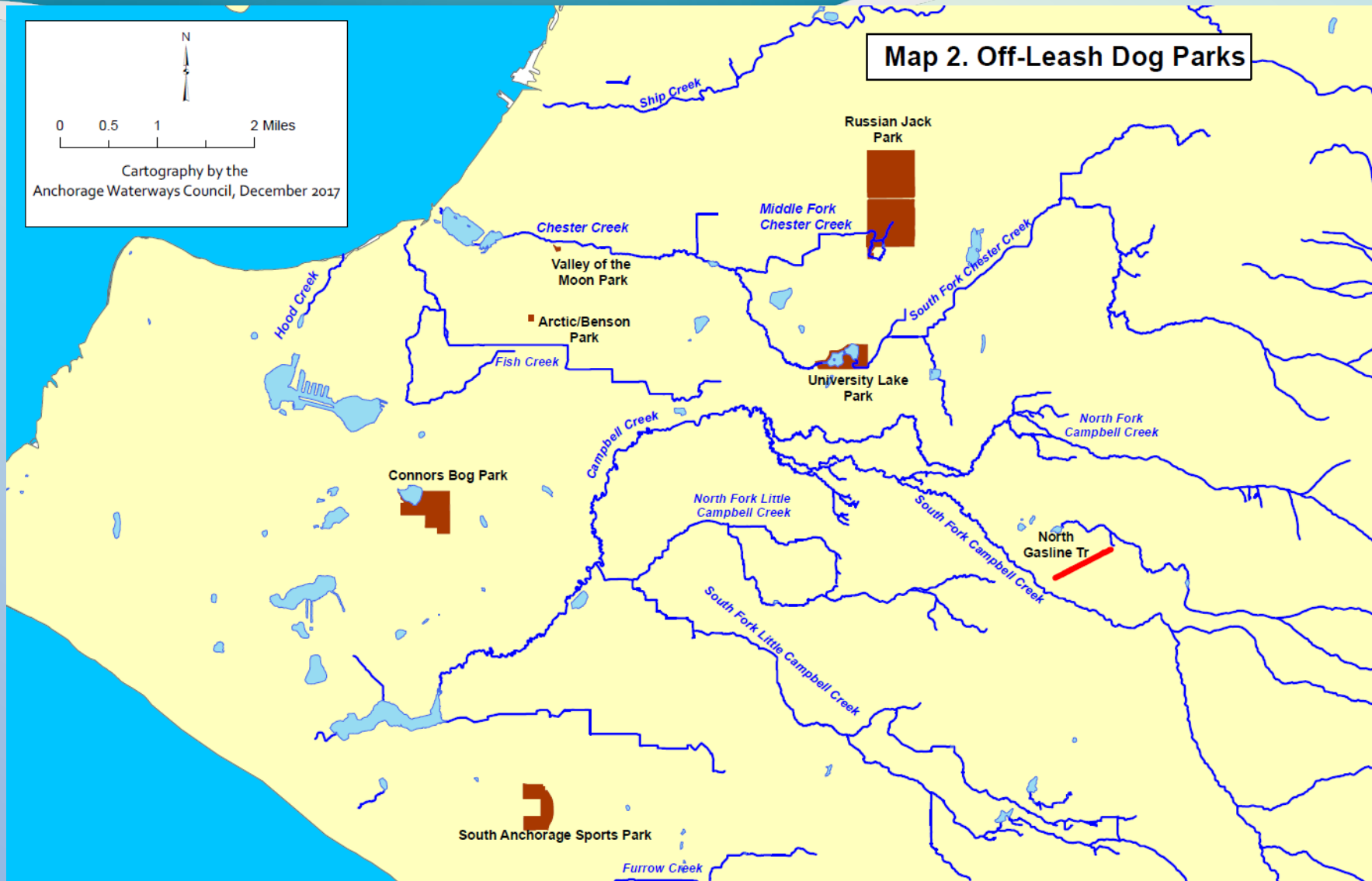
# Chester Creek Restoration Priorities



# Dog Parks



Map 2. Off-Leash Dog Parks

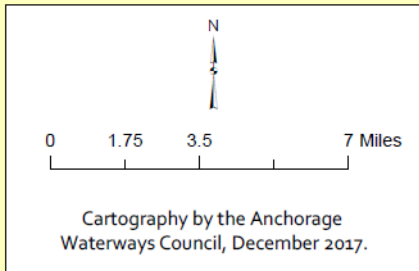


# Dog Parks



# Animal Facilities

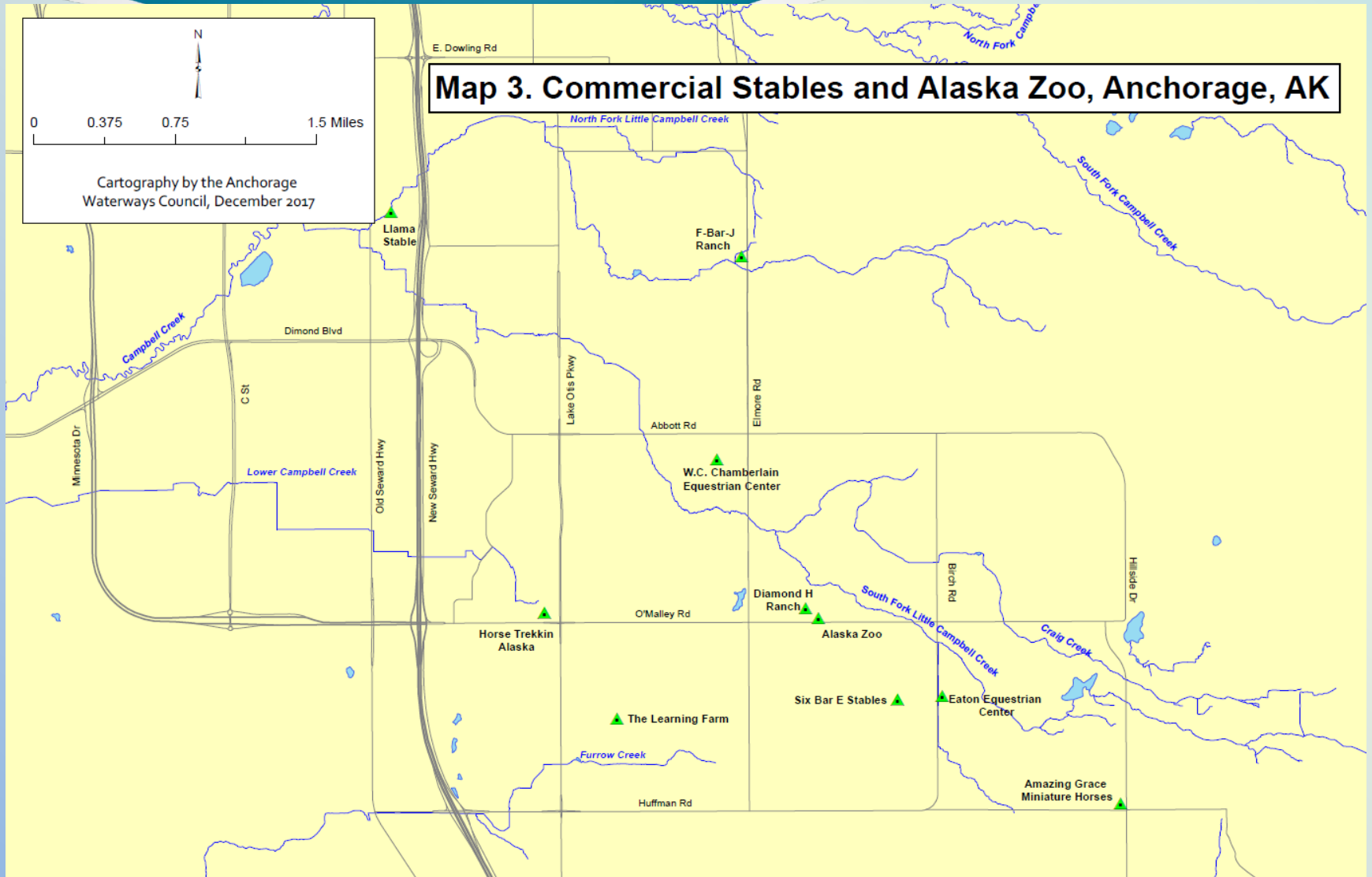
Map 1



## Animal Facilities

- Indoor Animal Facilities
  - 🏠 Airport Pet Relief Stations
  - 🟢 Animal Care and Control
1. AK Must Love Dogs
  2. Dog Tired Doggy Daycare
  3. Doggie Dog World
  4. Home Away From Home K-9 Daycare
  5. Arfie's Doggy Daycare
  6. Peters Creek Boarding Kennel
  7. Pat's TLC Boarding
  8. Purrfect Purr Cat Hotel
  9. Petco South
  10. Petco North
  11. AK Dog Wash Resort
  12. Alaska SPCA
  13. K-9 Aquatics
  14. Pet Zoo North
  15. Pet Zoo South
  16. Fido's Playground
  17. Southpaw Kennels
  18. Rabbit Creek Kennels
  19. Pet Smart South
  20. Pet Smart North
  21. Midnight Sun Service Dogs
  22. A Happy Dog Day Camp & Boarding
  23. A Happy Dog Day Camp & Boarding
  24. The Dog Park
  25. Ted Stevens Anchorage International Airport
  26. The Hound Lounge in Midtown

# Commercial Stables and Alaska Zoo



# Scoop the Poop!



Connors Bog on Scoop the Poop Day



University Lake on Scoop the Poop Day

**THERE IS NO  
POOP FAIRY!**



**BE A SUPER HERO!  
SCOOP UP AFTER  
YOUR PETS!**



[anchoragecreeks.org](http://anchoragecreeks.org)

# Creek Cleanup





# Fishing Line Recycling by AWC



Fishing line and trash collected from a monofilament bin near Ship Creek



# Fish Waste



## Fish Waste Handling & Disposal

August 2016



Division of  
Environmental Health

### Solid Waste Program

**Anchorage Office:**  
555 Cordova St  
Anchorage, AK 99501  
(907) 269-7802  
Fax (907) 269-7510

**Fairbanks Office:**  
610 University Ave  
Fairbanks, AK 99709  
(907) 451-2108  
Fax (907) 451-2188

**Juneau Office:**  
410 Willoughby Ave.  
Suite 303  
Juneau, AK 99801  
(907) 465-5318  
Fax (907) 465-5362

Improper disposal of fish waste from sport fishing, personal use fishing, and commercial fisheries poses a potential risk to the environment and public health and safety. The Alaska Department of Environmental Conservation (ADEC) Solid Waste Program only regulates the land disposal of fish waste from commercial operations. However, it is important to understand the best management practices for disposing fish waste to reduce nuisances and animal attraction.

#### Personal Use & Sport Fish Waste

Even for sport and personal use fishing, disposing of fish waste on public or private land is illegal and can result in fines. The [Alaska Department of Fish & Game](#) recommends that you clean fish riverside or in port, chop fish carcasses into numerous pieces, and throw them into deep or fast-moving water or use a provided fish grinder. Anglers who remove fish from the fishing site and fillet or process them must also dispose of fish waste in a safe manner:

- α Fish waste should be taken directly to a permitted landfill that will accept it.
  - The Central Peninsula Landfill in Soldotna accepts fish waste free of charge during the fishing season.
  - Anchorage Regional Landfill, the Central Transfer Station, and the Girdwood Transfer Station accept residential fish waste.
  - Matanuska-Susitna Borough takes bagged residential fish waste at the Palmer Central Landfill and the Big Lake, Butte, and Sutton transfer stations.
- α If you have local trash pickup, freeze the fish waste to eliminate odors and then put it out the morning of your trash pickup day. Do not place waste out the night before or put it in commercial dumpsters.

#### Commercial Fish Waste

ADEC Solid Waste Program allows three methods for managing commercial fish waste on land:

- α Landfill Disposal: Commercial fish waste may be disposed in a permitted landfill willing to accept it.

**Improper disposal of fish waste creates a dangerous bear attractant.**

- **Chop the fish carcass up and throw it into fast-moving water;**
- **Take it directly to the landfill; or**
- **Put it in YOUR trash the morning of pickup.**



# *APDES Annual Meeting*

BIRCH ROOM

## Essential Elements of the MSGP

Presented by:

William Ashton  
ADEC

# *APDES Annual Meeting*

ASPEN ROOM

## Campbell Creek Watershed Plan Scope

Presented by:

Cherie Northon  
Executive Director  
Anchorage Waterways Council

The background features a central blue shape with a white border, surrounded by wavy, layered shapes in shades of blue and beige. The overall design is modern and flowing.

# *Q & A Discussion*

Anchorage MS4 Permit



# 2019 Dry Weather Screening Municipality of Anchorage



2019 HDR Field Team: Alena Gerlek, Lynn Spencer, Kacy Grundhauser, Sabre Hill, and Eric Packer

## Program Objective

Identify illicit discharges of pollutants to the MS4 within the Municipality of Anchorage

## Methods

- Screen 15 outfalls/year for parameters indicative of potential illicit discharges
- Identify suitable alternate sites
- Sample after 48 hours of dry weather
- Field and laboratory analysis of 7 parameters
- Follow-up screening if threshold is exceeded

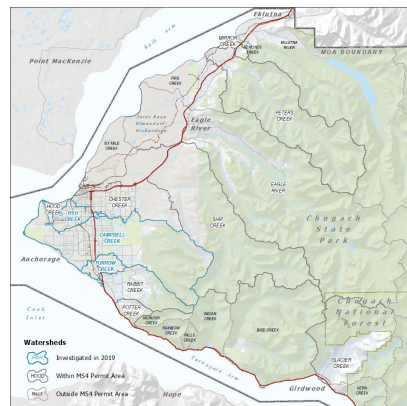
Parameter	Threshold
pH	≤ 4 or ≥ 9
Total Chlorine	≥ 1.0 mg/L
Detergents	≥ 1.0 mg/L
Total Copper	≥ 1.0 mg/L
Total Phenols	≥ 0.5 mg/L
Turbidity	≥ 250 NTU
Fecal Coliform	≥ 400 cfu/100 mL

NTU = nephelometric turbidity unit; cfu = colony forming unit

## Watershed Prioritization

The 12 watersheds within the MS4 permit area are prioritized based on four criteria:

- Impaired waters (Category 4 or 5)
  - Previously documented illicit discharges
  - Impervious area within the watershed
  - Commercial and industrial land use
- 3 watersheds are targeted for sampling each year

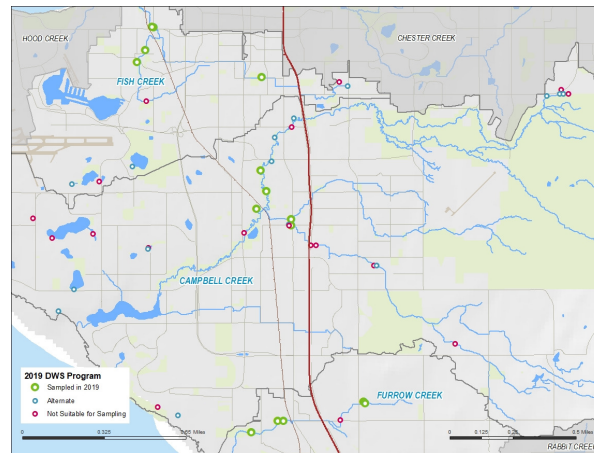


Watersheds within the Municipality of Anchorage

## 2019 Sampling and Reconnaissance

The 2019 program examined outfalls in **Furrow Creek, Campbell Creek** and **Fish Creek** watersheds. Reconnaissance occurred between May 22 and June 11. Sampling occurred on June 18 and June 27.

Watershed	Sampled	Alternate	Not Suitable for Sampling	Could Not Locate	Total
Campbell Creek	5	12	6	8	31
Fish Creek	5	3	1	2	11
Furrow Creek	5	0	1	0	6
<b>Total</b>	<b>15</b>	<b>15</b>	<b>8</b>	<b>10</b>	<b>48</b>



Outfalls sampled or examined in summer 2019

Outfalls in the watersheds targeted in 2019 were sampled previously during the current permit cycle; Campbell Creek in 2016 and Furrow Creek and Fish Creek in 2017. Outfalls that were not included in the 2016 and 2017 programs were prioritized for reconnaissance and sampling in 2019.

## Results

In 2019, **no outfalls sampled exceeded the threshold for any parameter**. One outfall sampled exceeded the threshold for fecal coliform when it was last sampled in 2017. This outfall was below the threshold in 2019.

Watershed	Outfall	2017 Results	2019 Results
Furrow Creek	5-1	Primary = <b>890 cfu/100mL</b> Follow-up = 4.9 cfu/100mL Replicate = 6.6 cfu/100mL	Not detectable

Results in bold indicate exceedance of parameter threshold

Outfalls targeted for sampling:

- Flowing
  - Previous exceedance/illicit discharge
  - Odor, scum/sheen, soapy suds, color, cloudiness, etc.
  - Evenly distributed throughout watershed
  - Not previously investigated in 2016 or 2017
- Outfalls selected as alternate sites:

- Low flow
  - Difficult to sample (access, outfall condition)
  - Drain less extensive networks
  - No previous exceedance/illicit discharge
  - Discharging apparently clear, clean water
- Field teams also documented outfalls that are submerged, clogged, or otherwise damaged and may require maintenance.



Fecal coliform exceedance documented at outfall 5-1 to Furrow Creek in 2017; no exceedance in 2019



Orange flocculent at outfall 1359-1 to Furrow Creek; no exceedances measured



Outfall 555-1 to Fish Creek curbside catch basin frost jacked and not flowing into storm drain



Outfall 703-1 to Campbell Creek is buried by sediment and vegetation



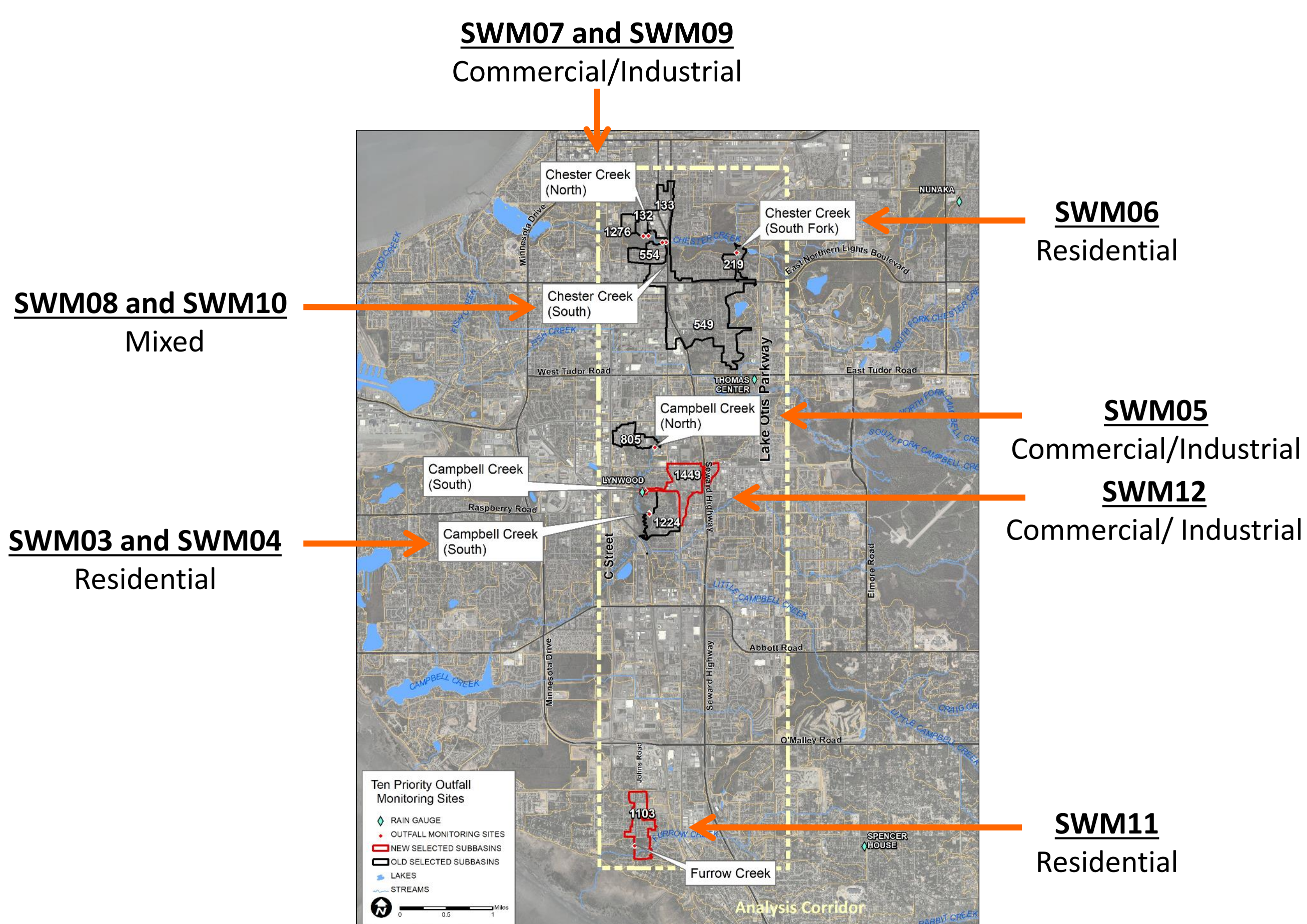
# 2019 Stormwater Outfall Monitoring Study of Pollutants in Stormwater Runoff, Year 9



## Objectives of Study

- Broadly estimate the annual pollutant loading for fecal coliform and petroleum hydrocarbon to specific watersheds.
- Assess the effectiveness of existing stormwater controls.
- Prioritize portions of the MS4 that need additional controls.
- Provide feedback on whether Total Maximum Daily Load (TMDL) objectives are being met.

## Ten Outfalls Monitored...



## Methodology

- Stormwater outfall sampled after >0.1 inch of precipitation in 24 hours preceded by 24 hours of ≤0.1 inch of precipitation. Velocity of flow measured and discharge from outfall calculated.
- Temperature, pH, DO, specific conductance, turbidity, and flow velocity measured with field probe and meter.
- Water quality samples collected for BOD<sub>5</sub>, TSS, fecal coliform, hardness, dissolved copper, TAH and TAqH.
- Visual observations recorded.



Outfall SWM07 (484-1), New Seward Highway at Chester Creek



Outfall SWM08 (86-1), New Seward Highway at Chester Creek

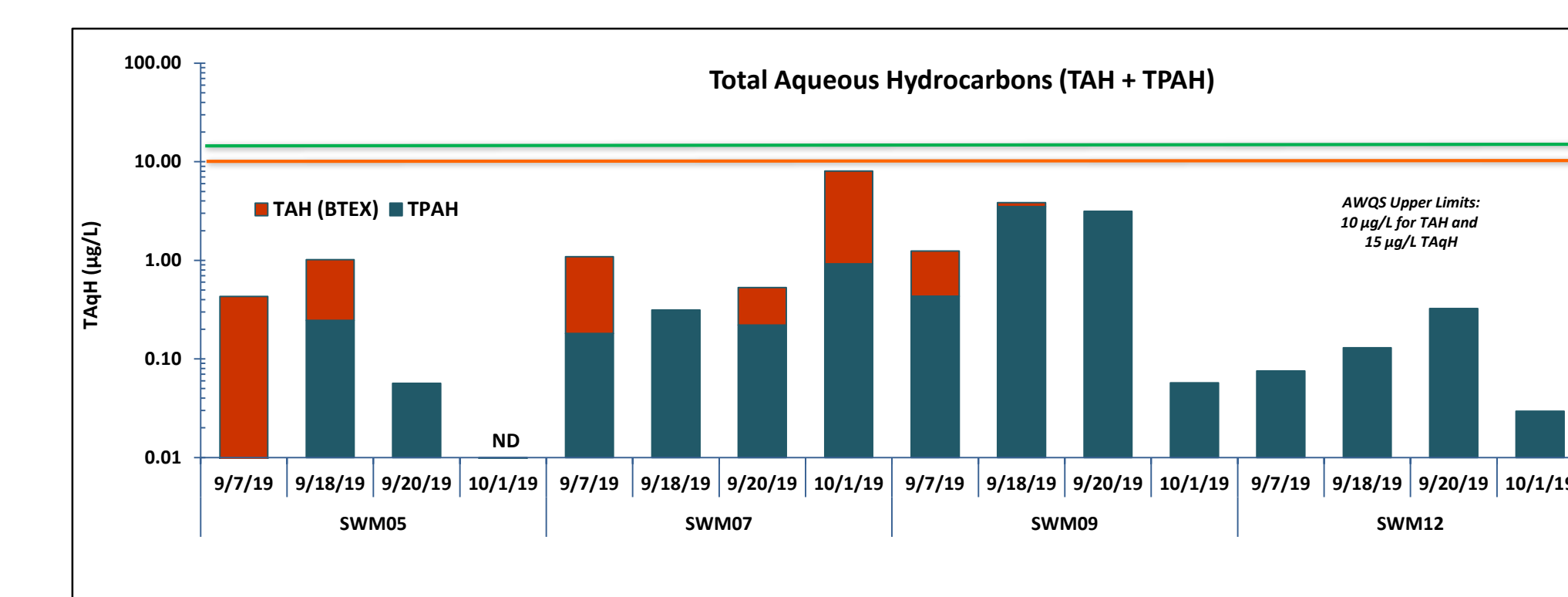
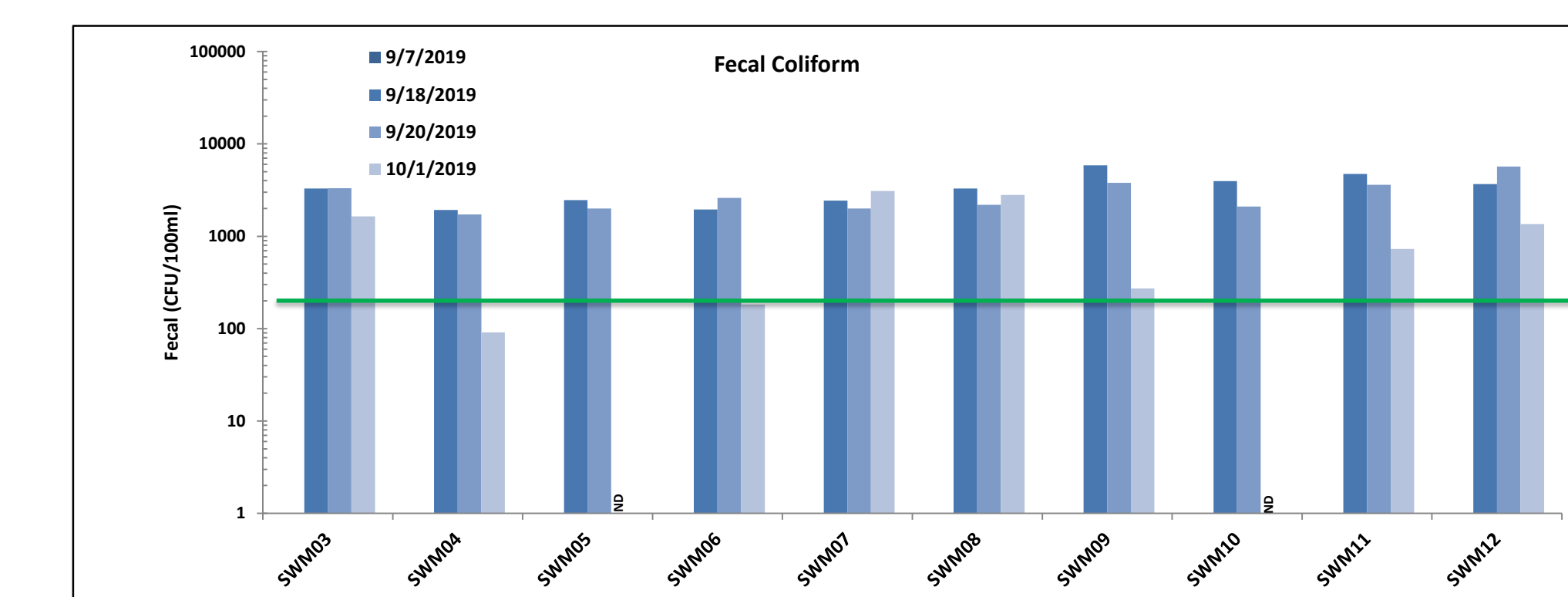
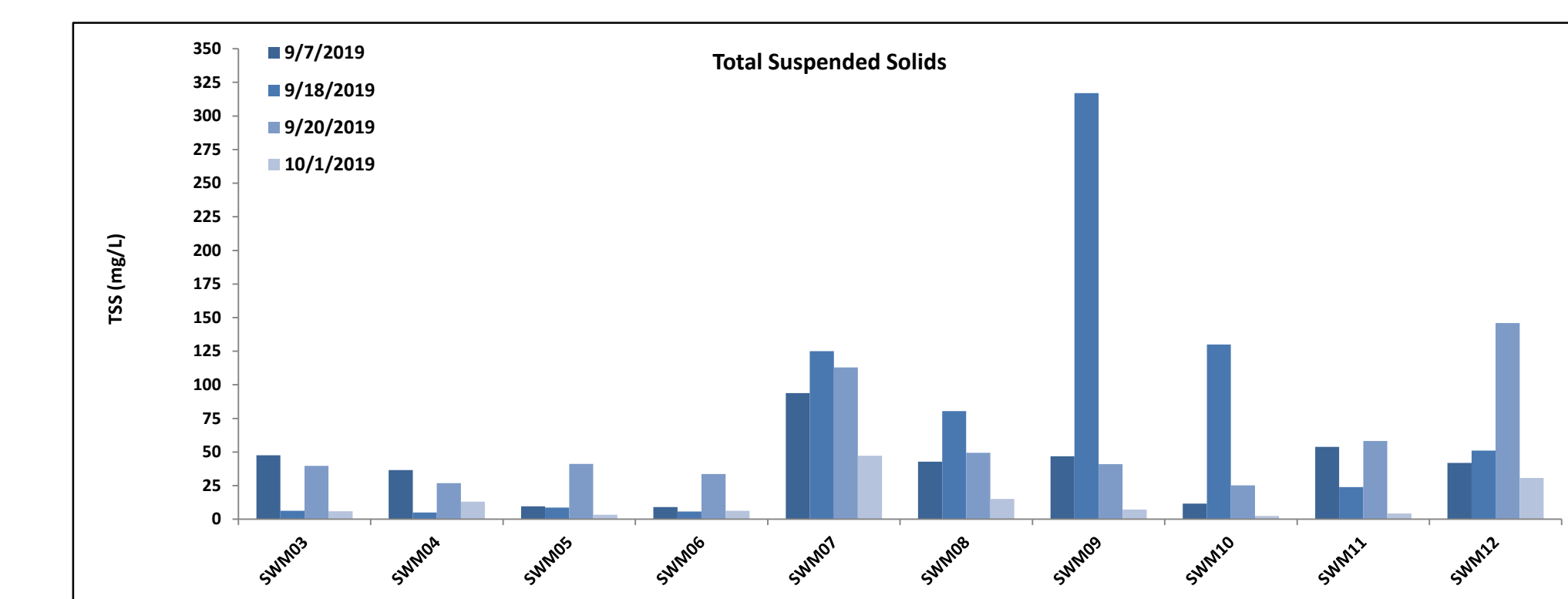
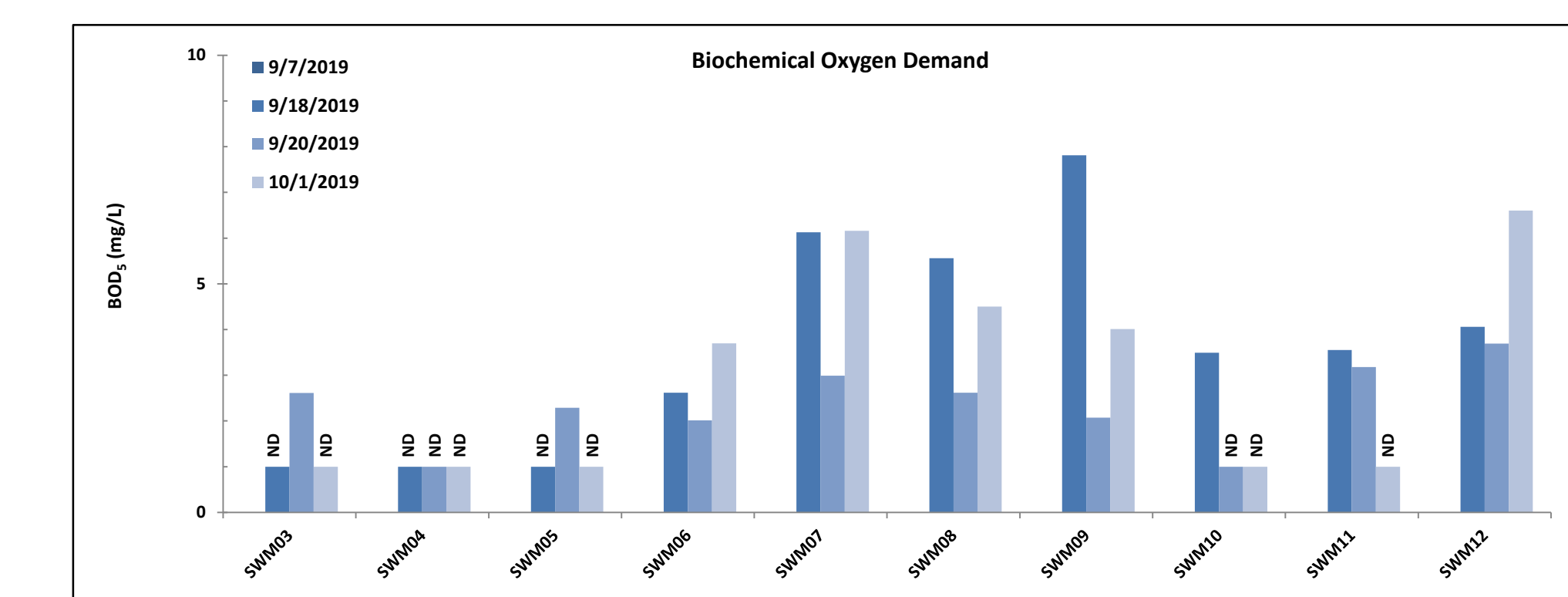
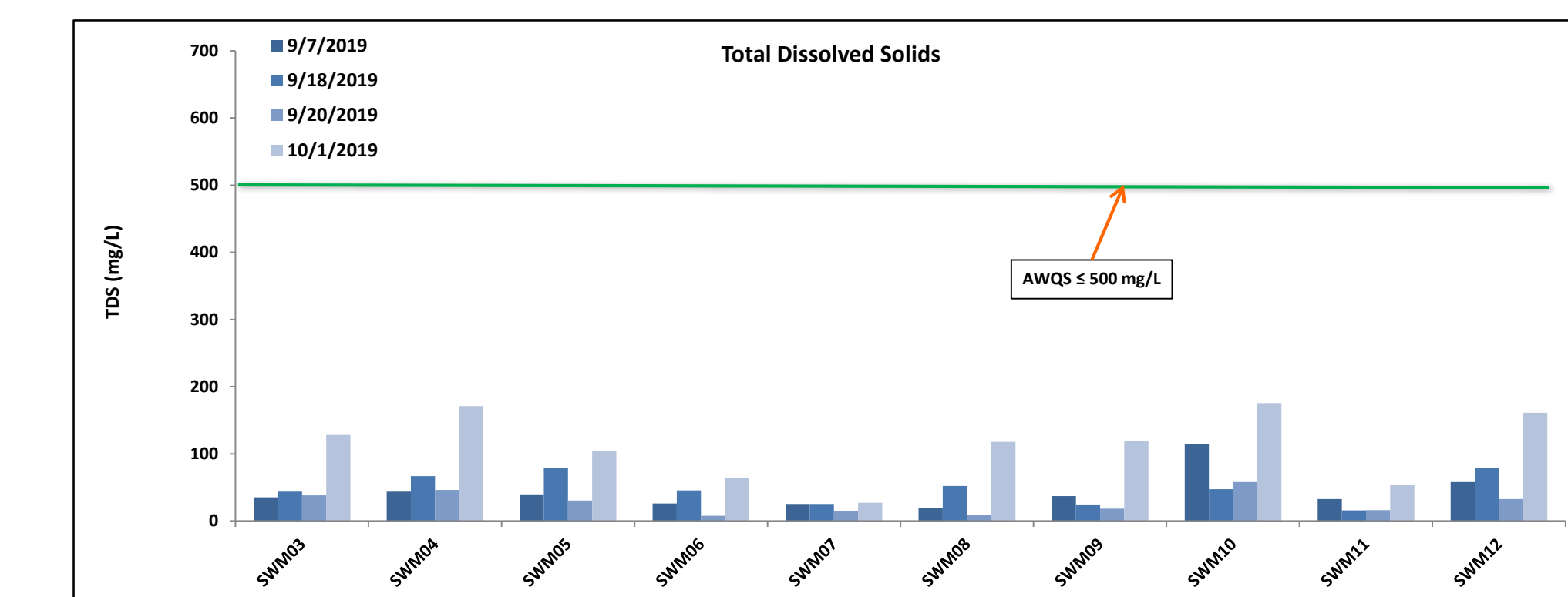
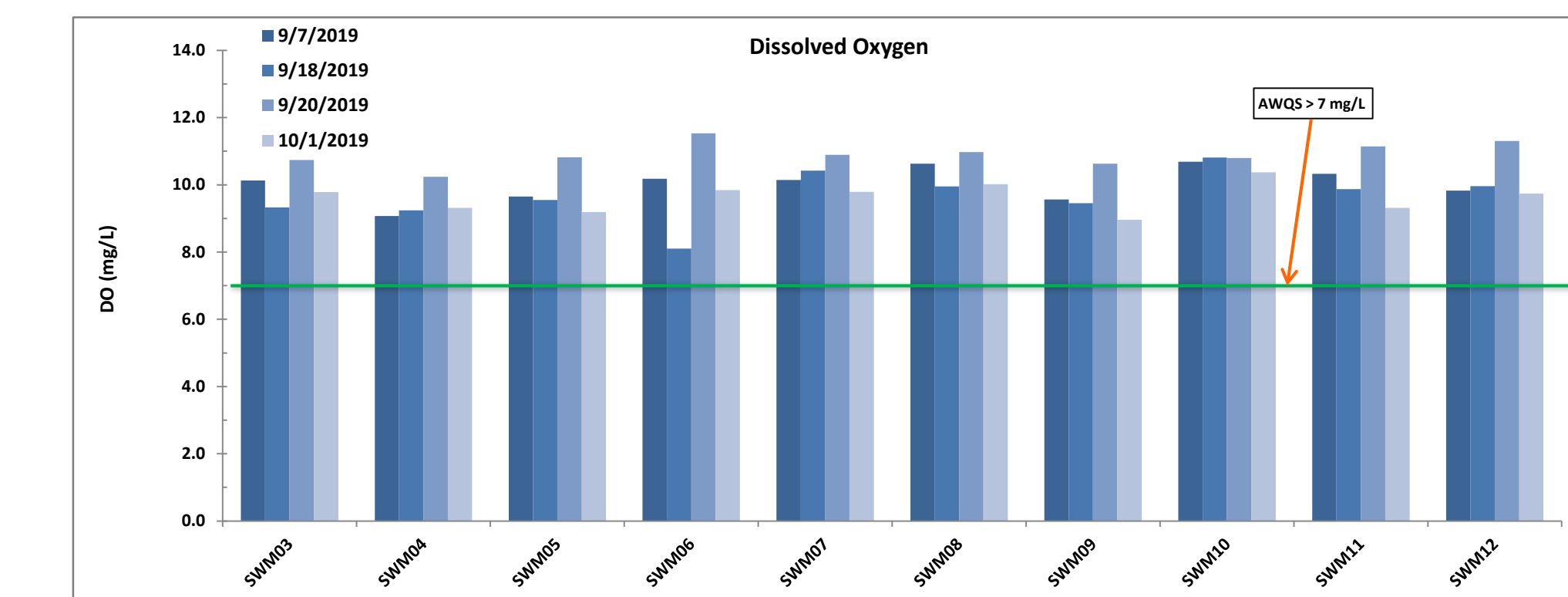
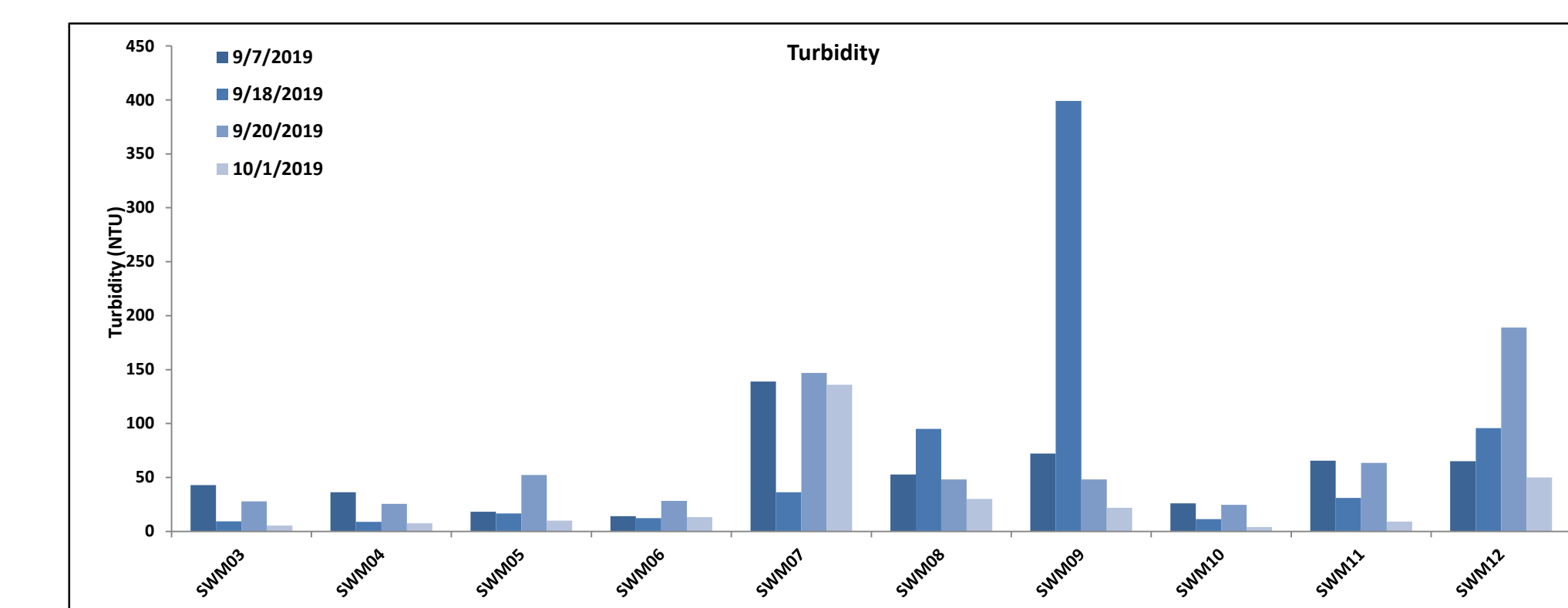


Outfall SWM09 (449-1), Anchorage Football Stadium & Ben Boeke Ice Arena to Chester Creek

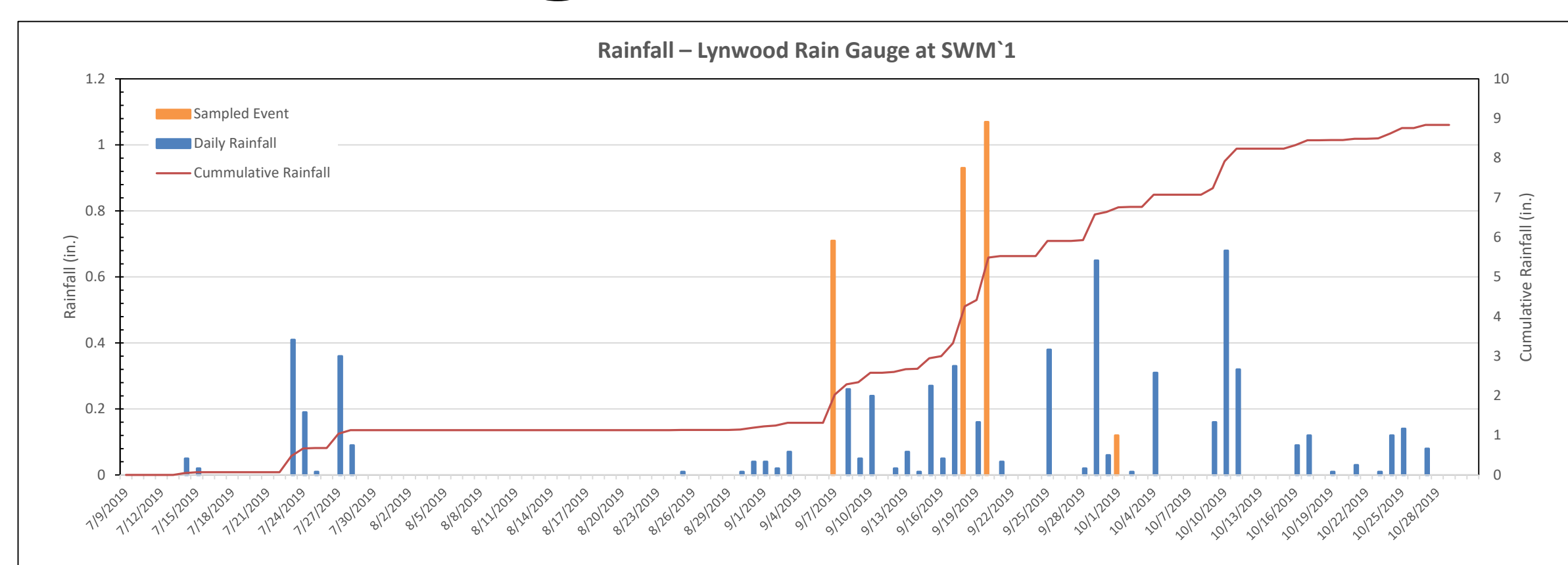


Outfall SWM12 (1454-1), Lynwood Retention Basin to Campbell Creek

## Results



## During Four Storms...



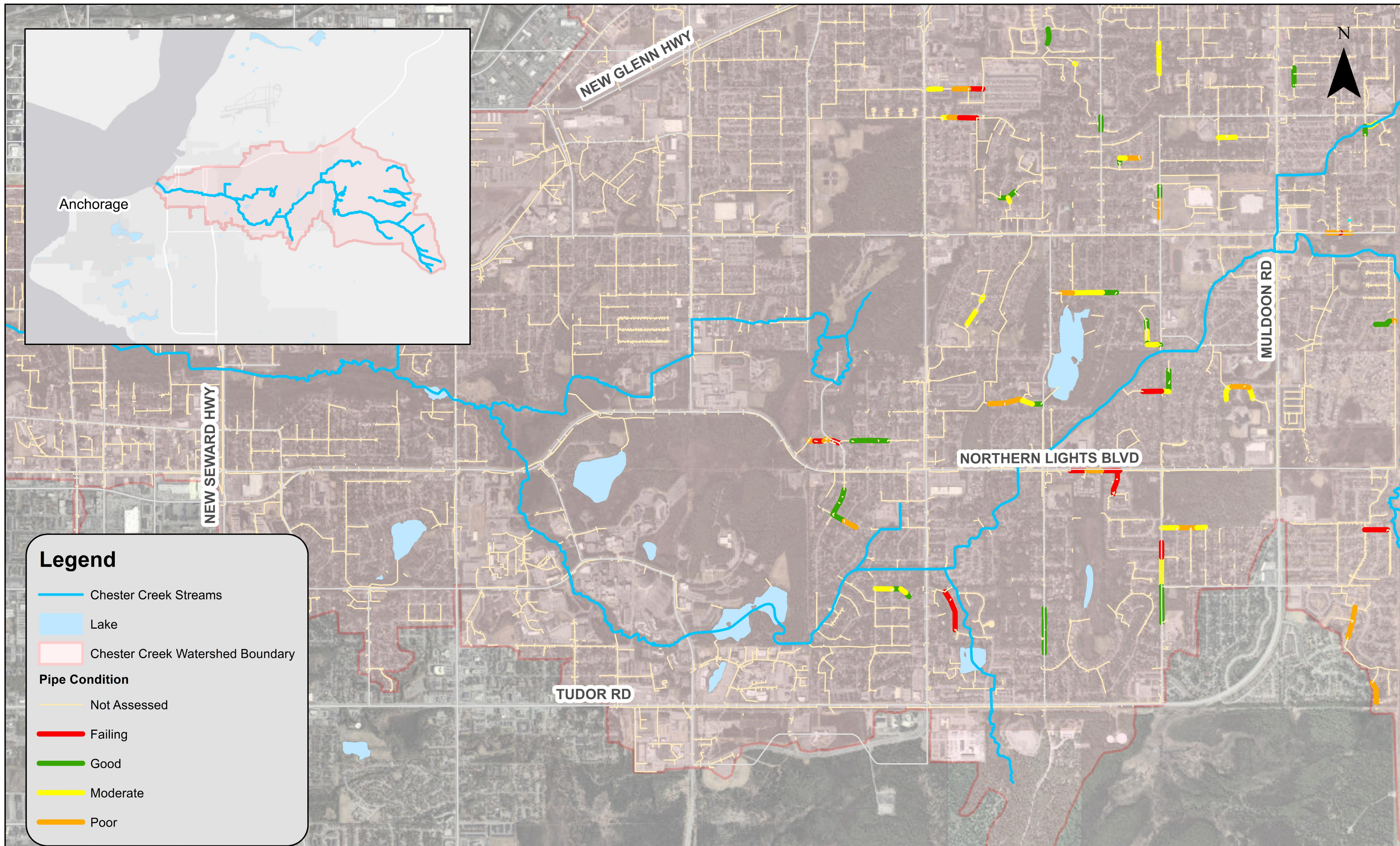
## For Eleven Parameters

Flow (gal/min)	Biological Oxygen Demand (5 Day) (BOD <sub>5</sub> ; mg/L)
Dissolved oxygen (DO; mg/L)	Fecal coliform (FC/100mL)
pH	Total suspended solids (TSS; mg/L)
Turbidity (NTU)	Total aromatic hydrocarbons (TAH; µg/L)*
Temperature (°C)	Total aqueous hydrocarbons (TAqH; µg/L)*
Dissolved copper	*sampled at SWM05, SWM07, SWM09, and SWM12. SWM05 and SWM09 contain OGS units; SWM07 and SWM12 do not.

## Key Findings

- The highest fecal coliform concentration measured 5,870 CFU/100mL. By comparison, during 2018, eight outfalls exceeded 10,000 CFU/100mL. Overall, peak concentrations found in 2019 were substantially decreased from those seen in prior years.
- Despite the general decrease in measured fecal coliform concentrations this year, fecal coliform measurements were still found to exceed the AWQS benchmark of 200 CFU/100 mL; however levels were similar to EPA estimates for median concentrations in cold climates (1,000 CFU/ 100 mL).
- Hydrocarbon concentrations and loading were below AWQS at all four sites; however, concentrations of TAqH were generally higher than previous years.
- It is possible that the extreme drought and wildfire smoke experienced in Anchorage during the summer affected some of the parameters measured.

# Chester Creek Watershed Storm Drain Condition Assessment



## Project Overview

This project is collecting pipe condition information from select storm drains in the Chester Creek watershed and using that data to estimate conditions of storm drains area-wide.

This poster reflects actual condition information collected via CCTV pipe inspection.

Generally, the pipes are categorized as follows:

**Good** = No replacement needed

**Moderate** = Replace in 20 years

**Poor** = Replace in 10 years

**Failing** = Replace in 5 years

## Inspection Results Summary (to date)

Pipe Condition	Length (miles)
Good	1.4
Moderate	1.2
Poor	1.1
Failing	0.9
Not Assessed	143.6

From left to right:  
Examples of CCTV pictures of pipes in good, moderate, poor, and failing conditions.

