

Willard Beach Water Quality Monitoring & Piped Infrastructure Improvements

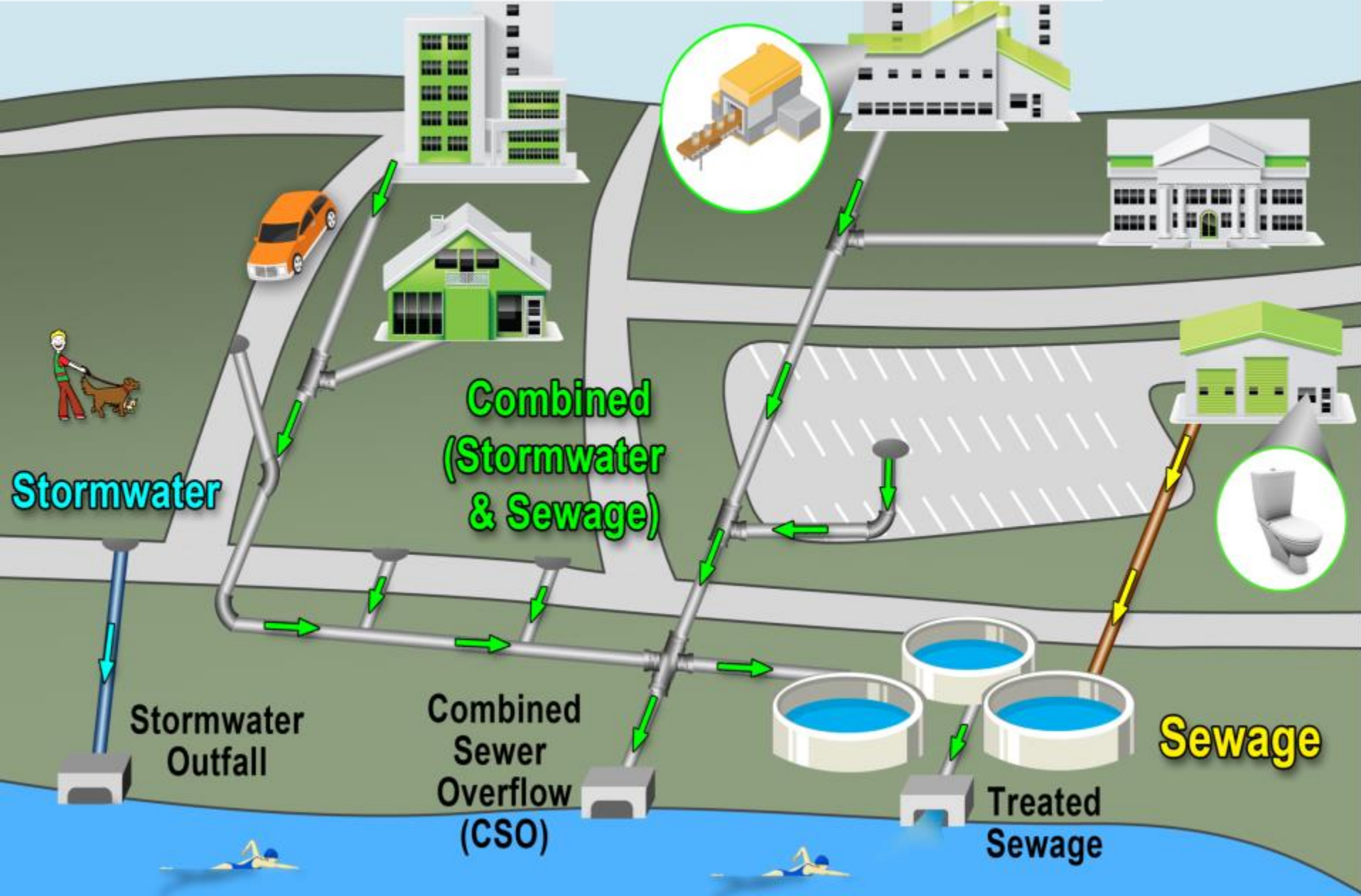


Fred Dillon - Stormwater Program Coordinator

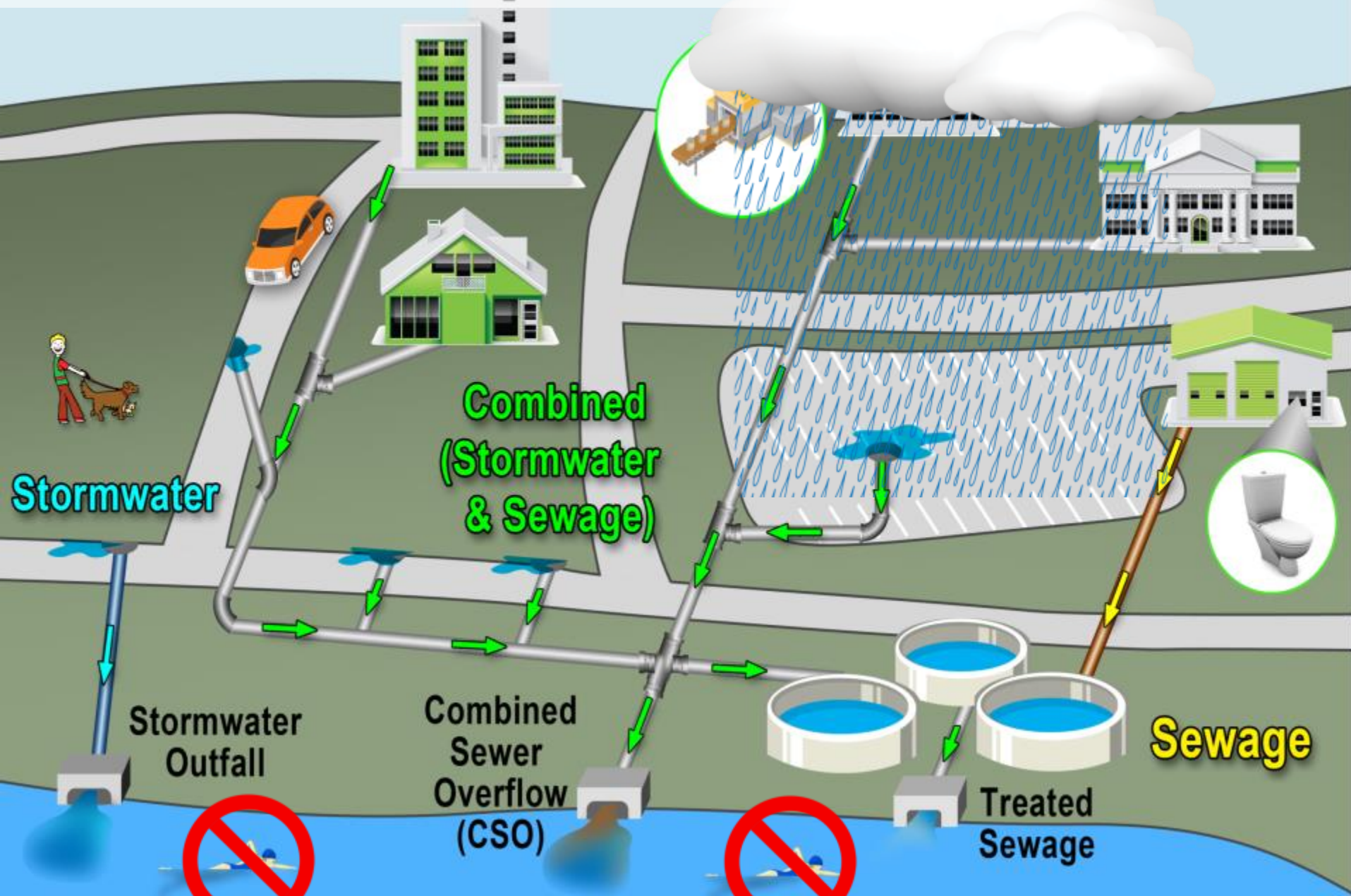


CITY OF
**SOUTH
PORTLAND**
Water Resource
Protection

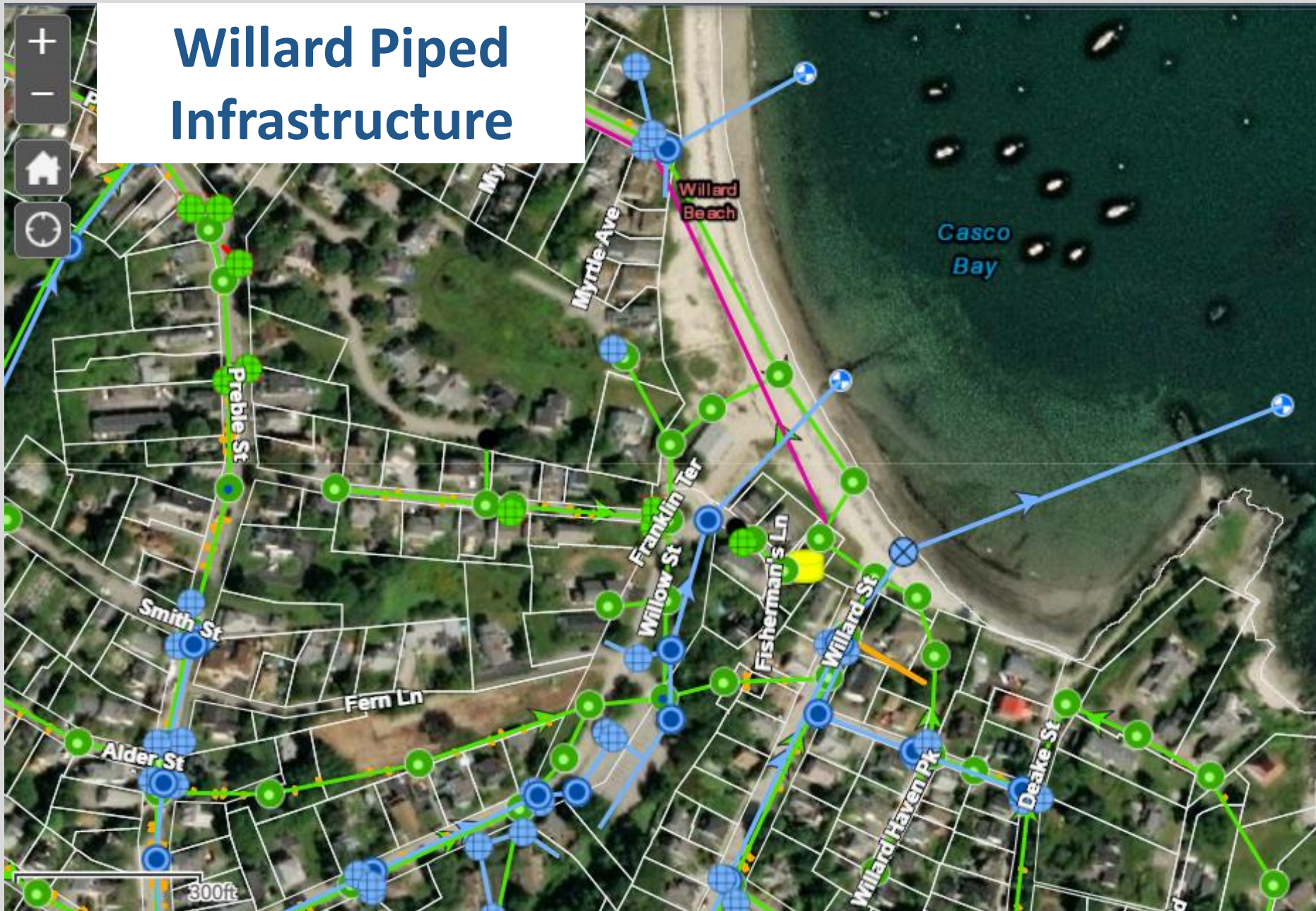
Municipal Piped Infrastructure



Municipal Piped Infrastructure

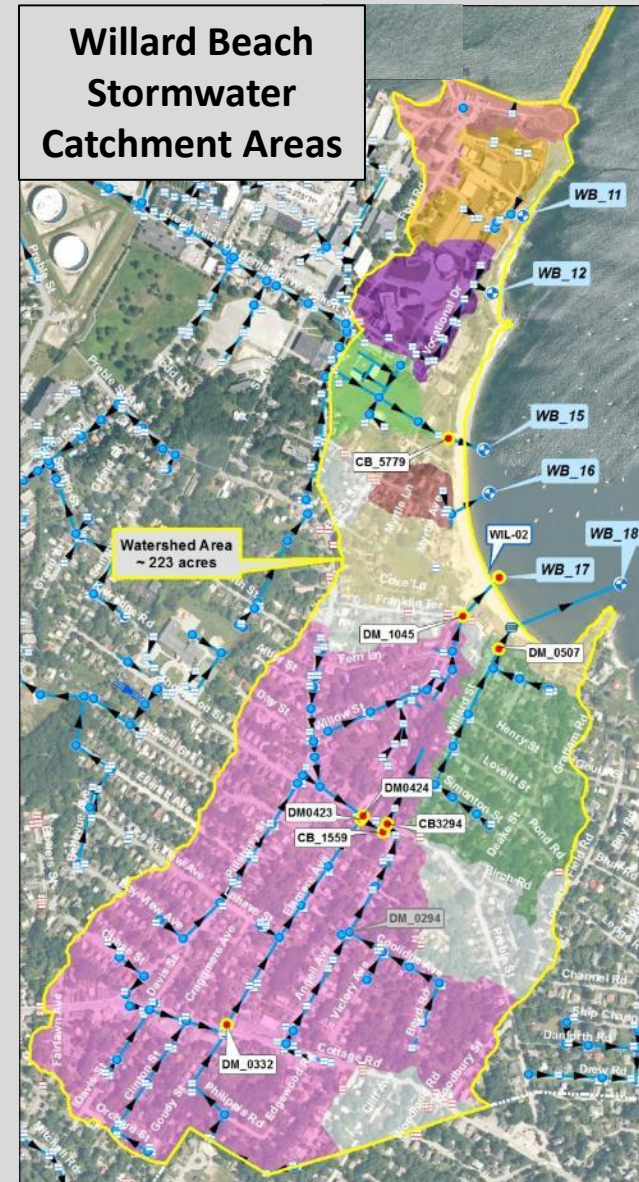


Willard Piped Infrastructure



Willard Beach Watershed

- ~223 acre watershed
- ~2,000' sandy beach
- 7 public access points
- Used year-round
- WQ monitoring since 1997
- MHB participant since 2003



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- ~223 acre watershed
(41% Impervious Cover)
- ~2,000' sandy beach
- 7 public access points
- Used year-round
- WQ monitoring since 1997
- MHB participant since 2003
- *History of elevated bacteria levels w/ numerous advisories*





Willard Beach Water Quality



**Bathhouse Flag
Indicates Daily
Swimming Conditions**



OPEN – no advisory or closure.

ELEVATED BACTERIA ADVISORY
Bacteria levels may be unsafe.
Water contact not advised.

PRECAUTIONARY RAINFALL ADVISORY
Rainfall can increase bacteria levels.
Water contact not advised.

CLOSED – no swimming or
water contact activities.



Water quality can change unexpectedly and rainfall can increase bacteria levels. Swim at your own risk. FMI please use QR code links.



3/6/24

NOTICE

South Portland Stormwater Outfall

**May have elevated
bacteria levels**

**Please avoid contact
with pipe discharge**

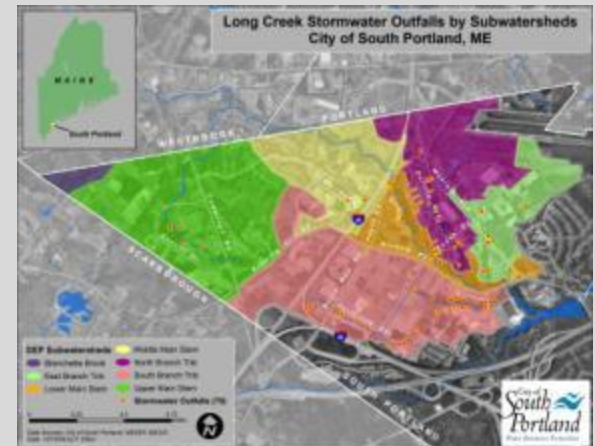


Scan FMI on WRP webpage

MS4 Permit Requirements

Illicit Discharge Detection & Elimination (MCM3)

- Identify & **eliminate pollution sources ASAP**
- Maintain & update stormwater infrastructure mapping



Willard Beach / South Portland, ME
Stormwater System Monitoring Locations

Watershed Area
 ~ 223 acres

Monitoring Locations:
 CB_5014
 WIL-02
 WB_17
 DM_1045
 DM_0507

Watershed Area
~ 223 acres

CB_5014

WIL-02

WB_17

DM_1045

DM_0507

Willard Beach Water Quality Sampling Locations

Beach water quality sample location varies depending on tidal conditions and is collected roughly along this transect

Wil-02

WB_17

When WB_17 is submerged by high tide, stormwater sample is collected at next upstream structure (DM_1045)

Wastewater Structures

SMH

Wastewater Mains

Force Main

Gravity

Drainage Pipes

Gravity

Drainage Outfalls



LOW ST

Willard Beach

6_7

Playground

6_6

Beach House

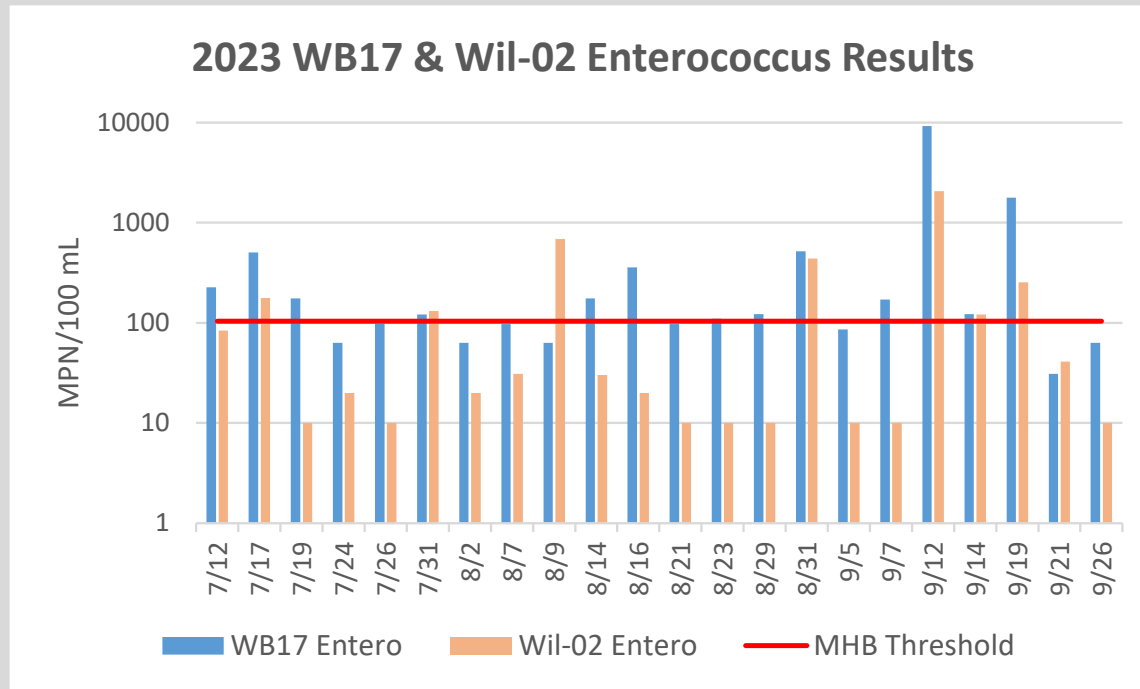
40ft







2023 Beach & WB17 Entero Results



WB17>Wil02 19

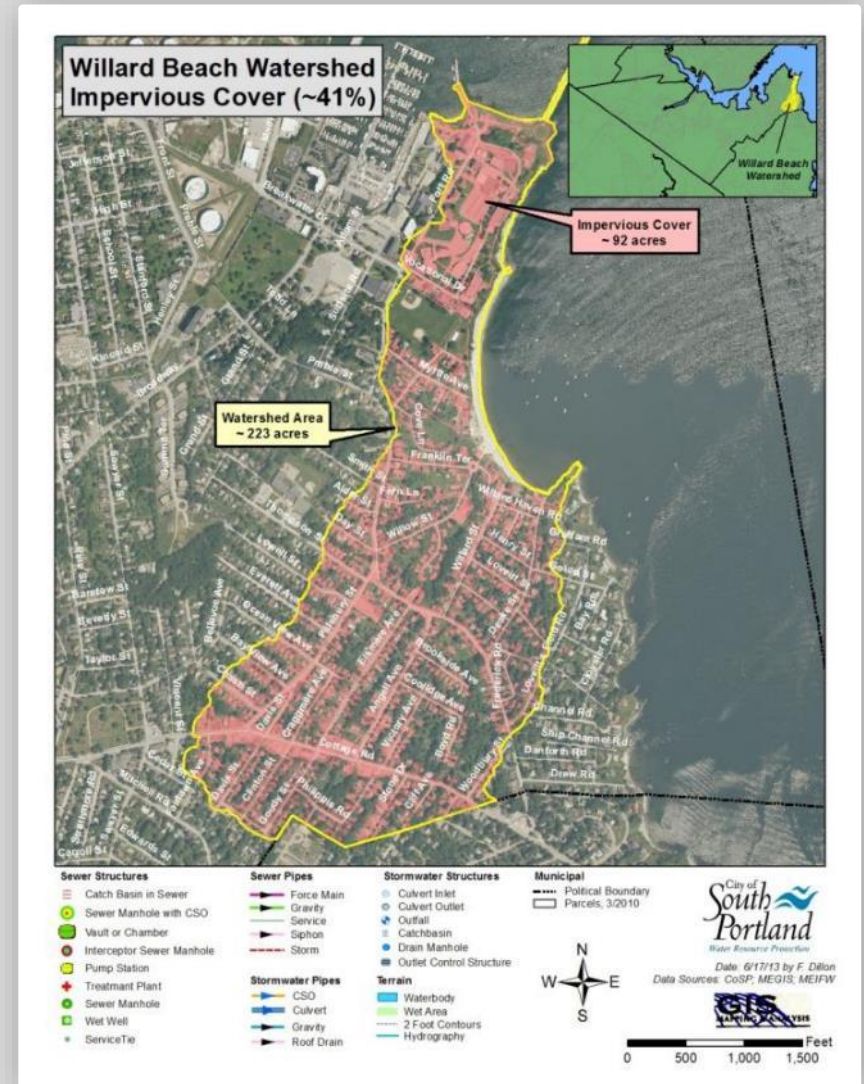
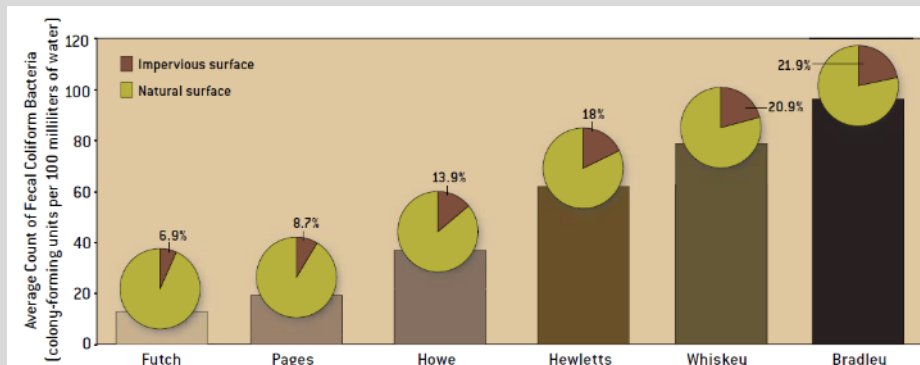
Wil02>WB17 3

WB17>MHB 13

Wil02>MHB 7

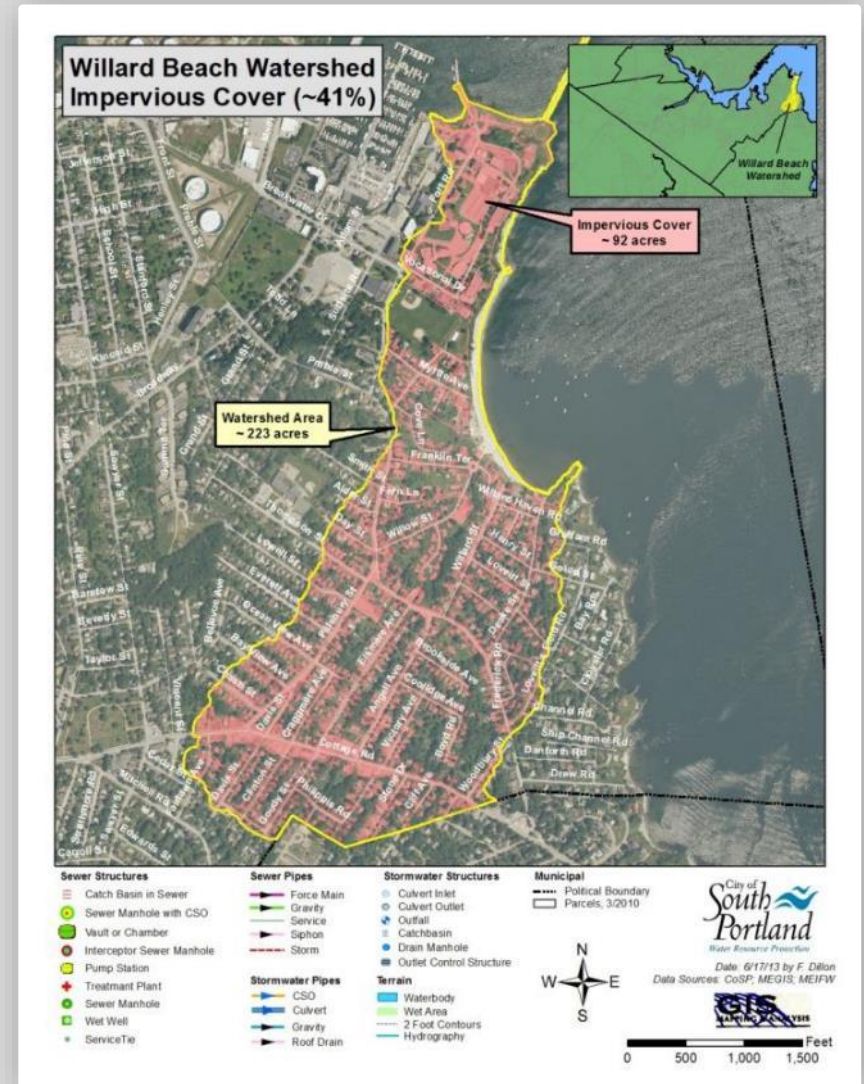
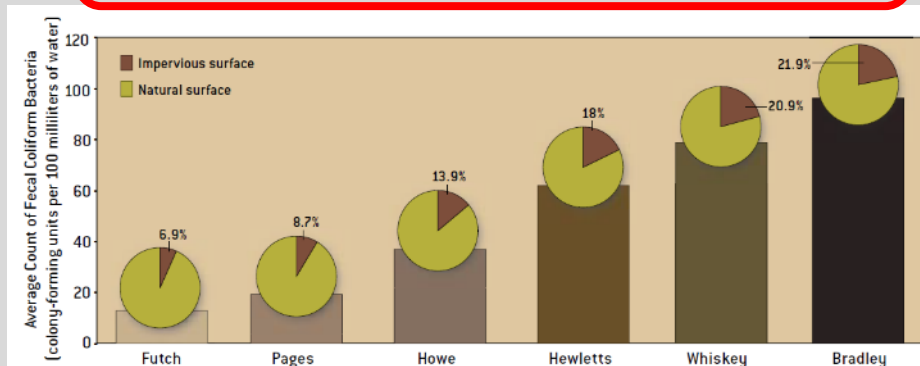
Potential Bacteria Sources

- Watershed activities
- Beach activities
- Storm drain re-growth
- “Out there” (Casco Bay)
- Wrack (sea weed, etc.)
- Sewers to storm drains



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- Storm drain re-growth
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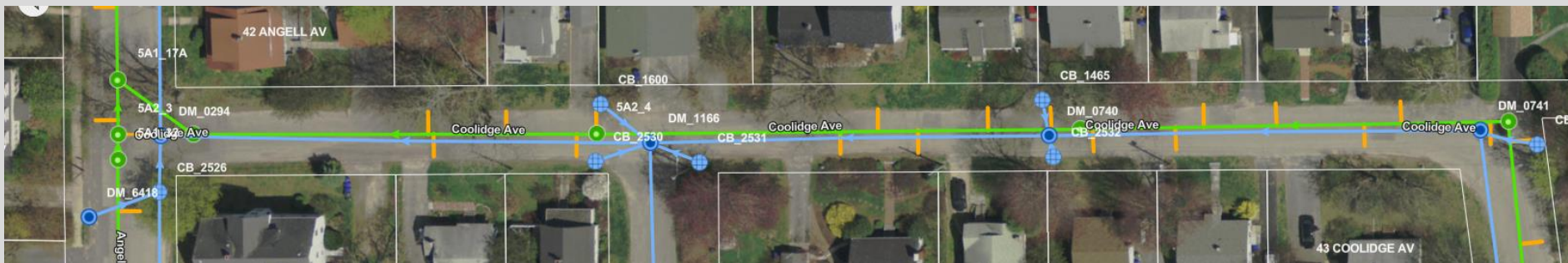
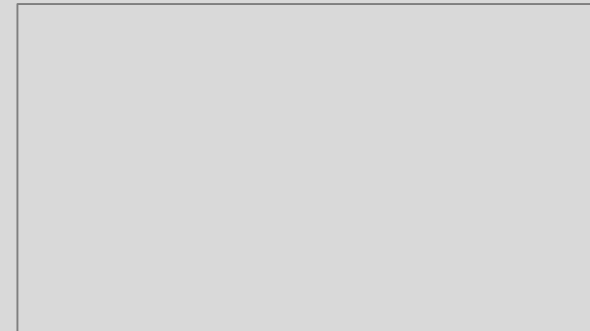
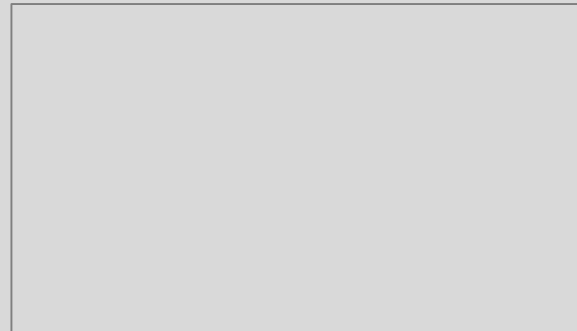
Co-Located Sewers & Storm Drains

INFILTRATION

EXFILTRATION

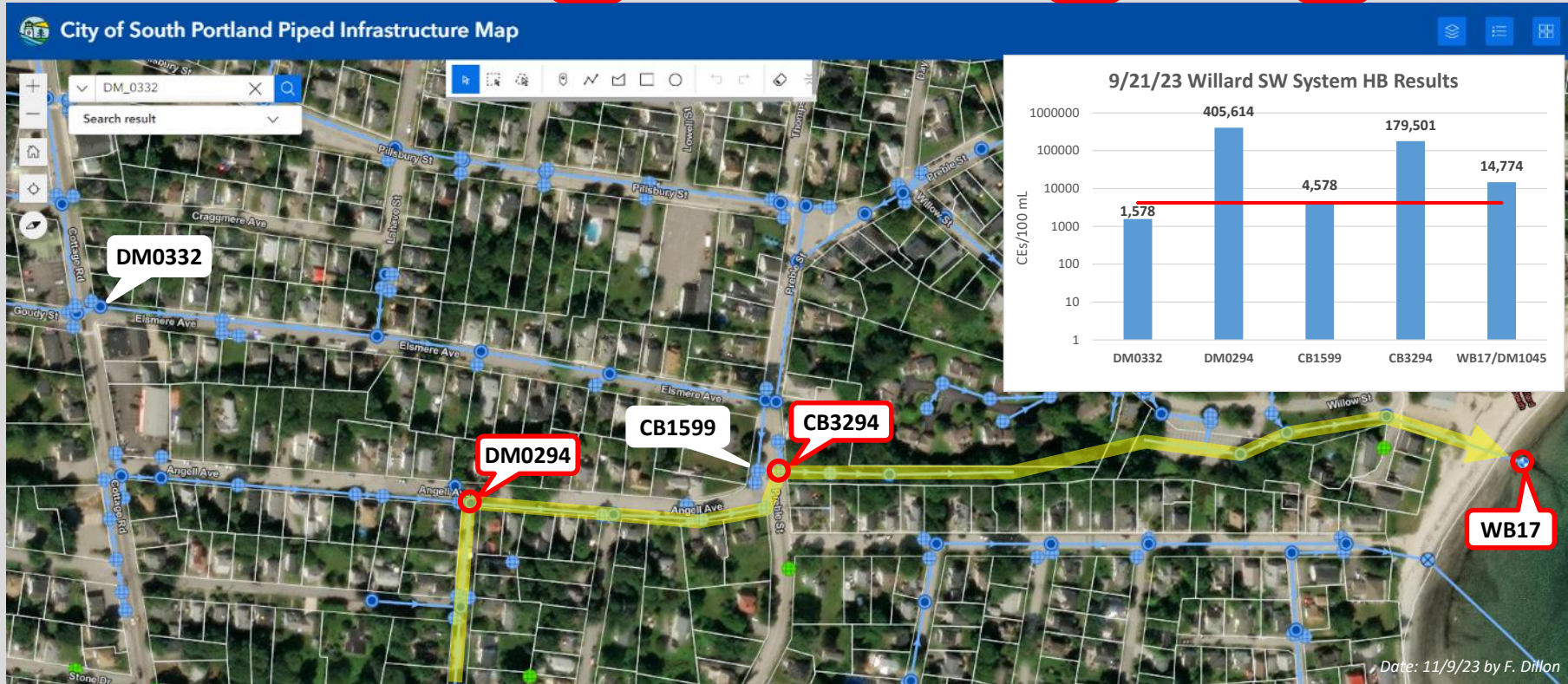
Sewer

Stormwater



2023 SW System WQ Results (9/21)

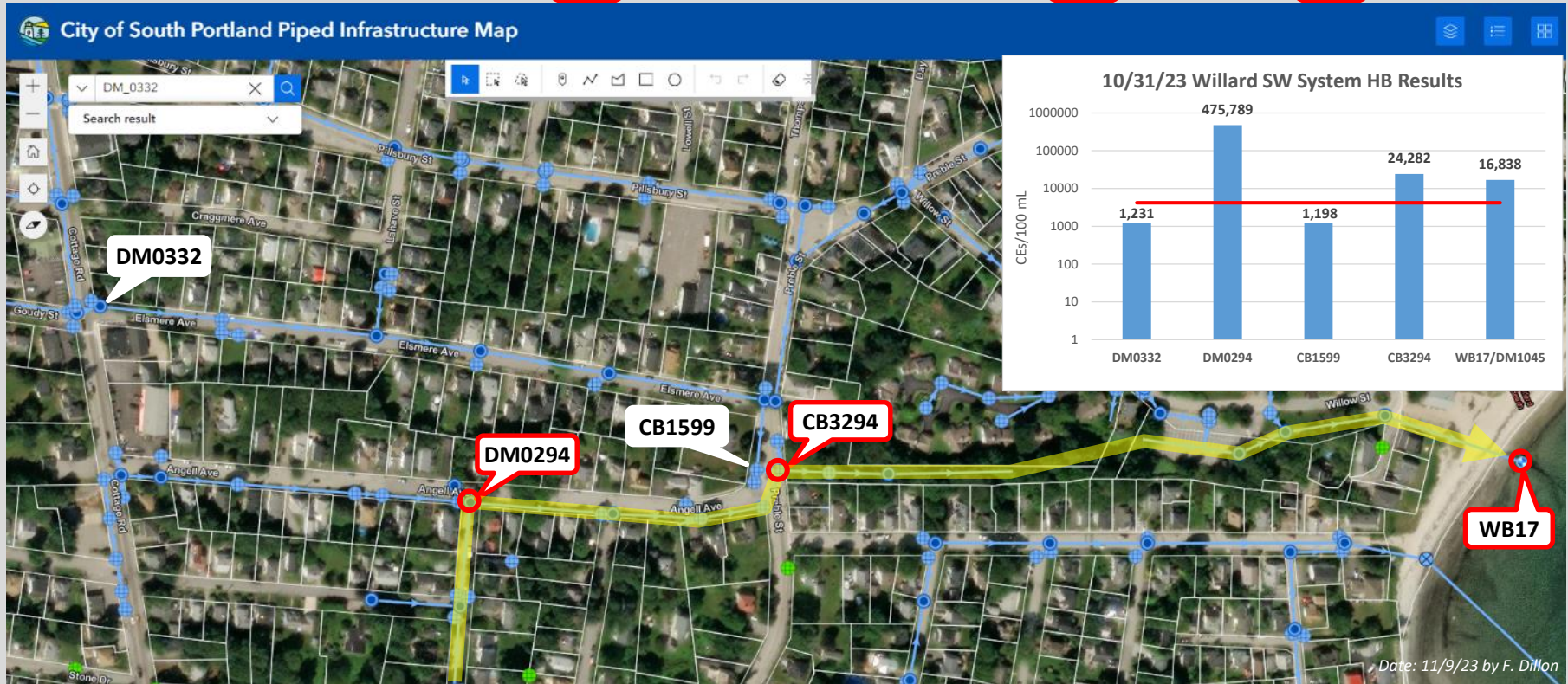
	DM0332			DM0294			CB1599			CB3294			WB17 (DM1045)			Precip	
Sample Date	Entero MPN/100mL	OB (ug/L)	HB (CEs / 100mL)	Entero MPN/100mL	OB (ug/L)	HB (CEs / 100mL)	Entero MPN/100mL	OB (ug/L)	HB (CEs / 100mL)	Entero MPN/100mL	OB (ug/L)	HB (CEs / 100mL)	Entero MPN/100mL	OB (ug/L)	HB (CEs / 100mL)	Precip 1 day prior	Precip 2 days prior
9/21/23	86	110	1,578	158	98	405,614	63	99	4,578	171	75	179,501	31	37	14,774	0	0.95



Human Bacteroides is specific for fecal contamination from human sources

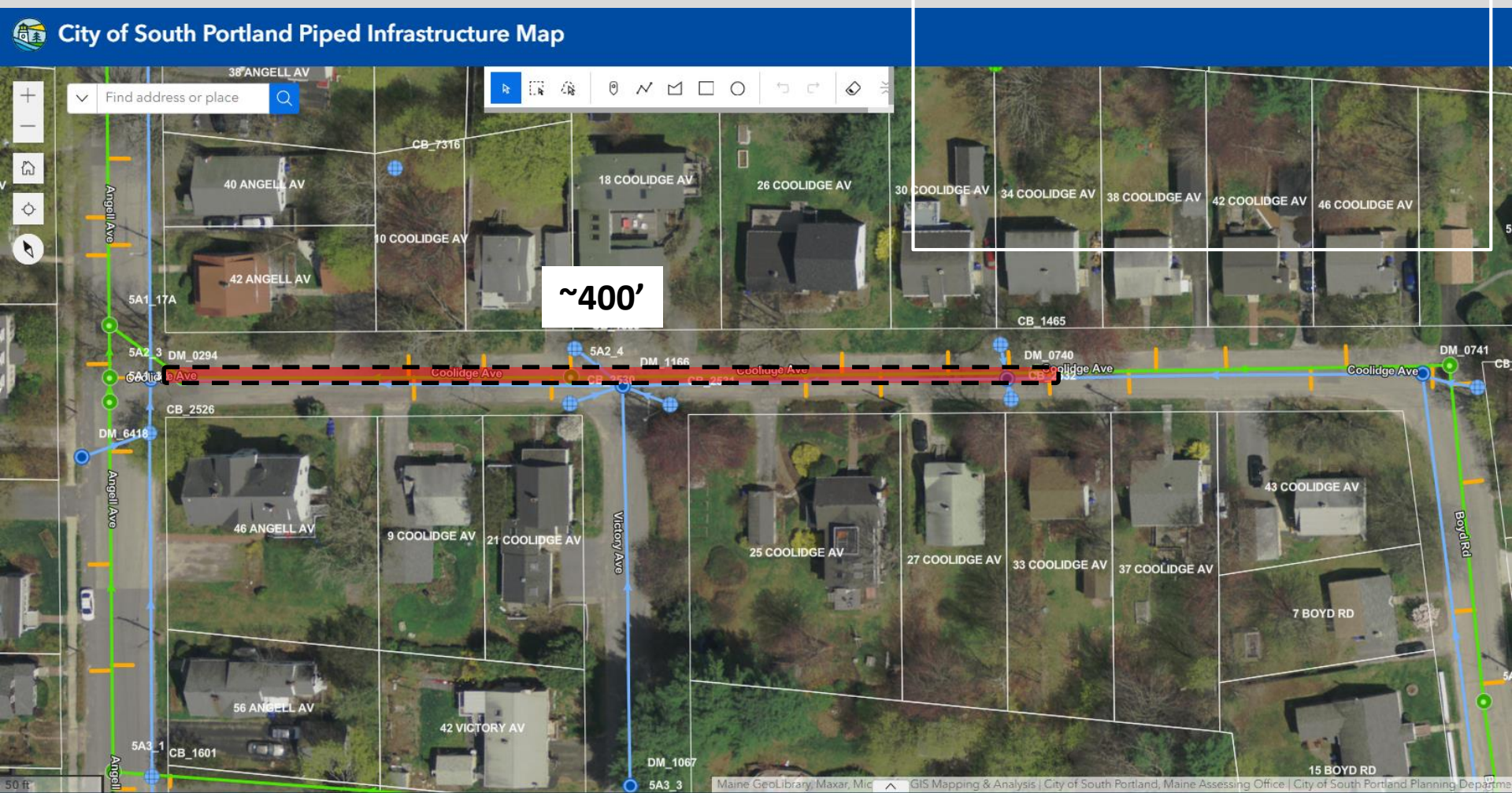
2023 SW System WQ Results (10/31)

	DM0332			DM0294			CB1599			CB3294			WB17 (DM1045)			Precip	
Sample Date	Entero MPN/100mL	OB (ug/L)	HB (CEs / 100mL)	Entero MPN/100mL	OB (ug/L)	HB (CEs / 100mL)	Entero MPN/100mL	OB (ug/L)	HB (CEs / 100mL)	Entero MPN/100mL	OB (ug/L)	HB (CEs / 100mL)	Entero MPN/100mL	OB (ug/L)	HB (CEs / 100mL)	Precip 1 day prior	Precip 2 days prior
10/31/23	345	120	1,231	657	94	475,789	373	136	1,198	798	76	24,282	171	27	16,838	0.72	0.85



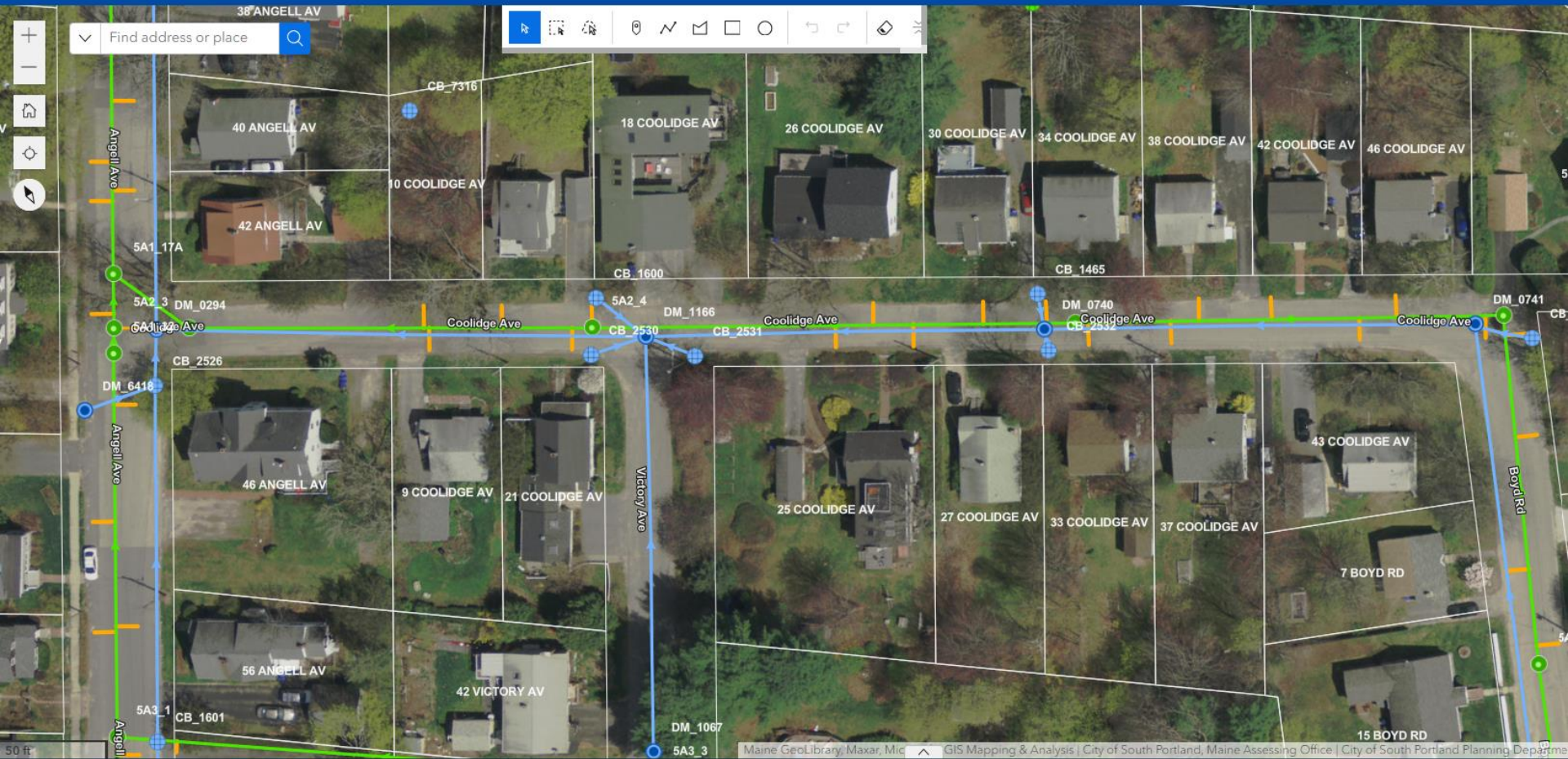
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March 2024 Sewer Lining



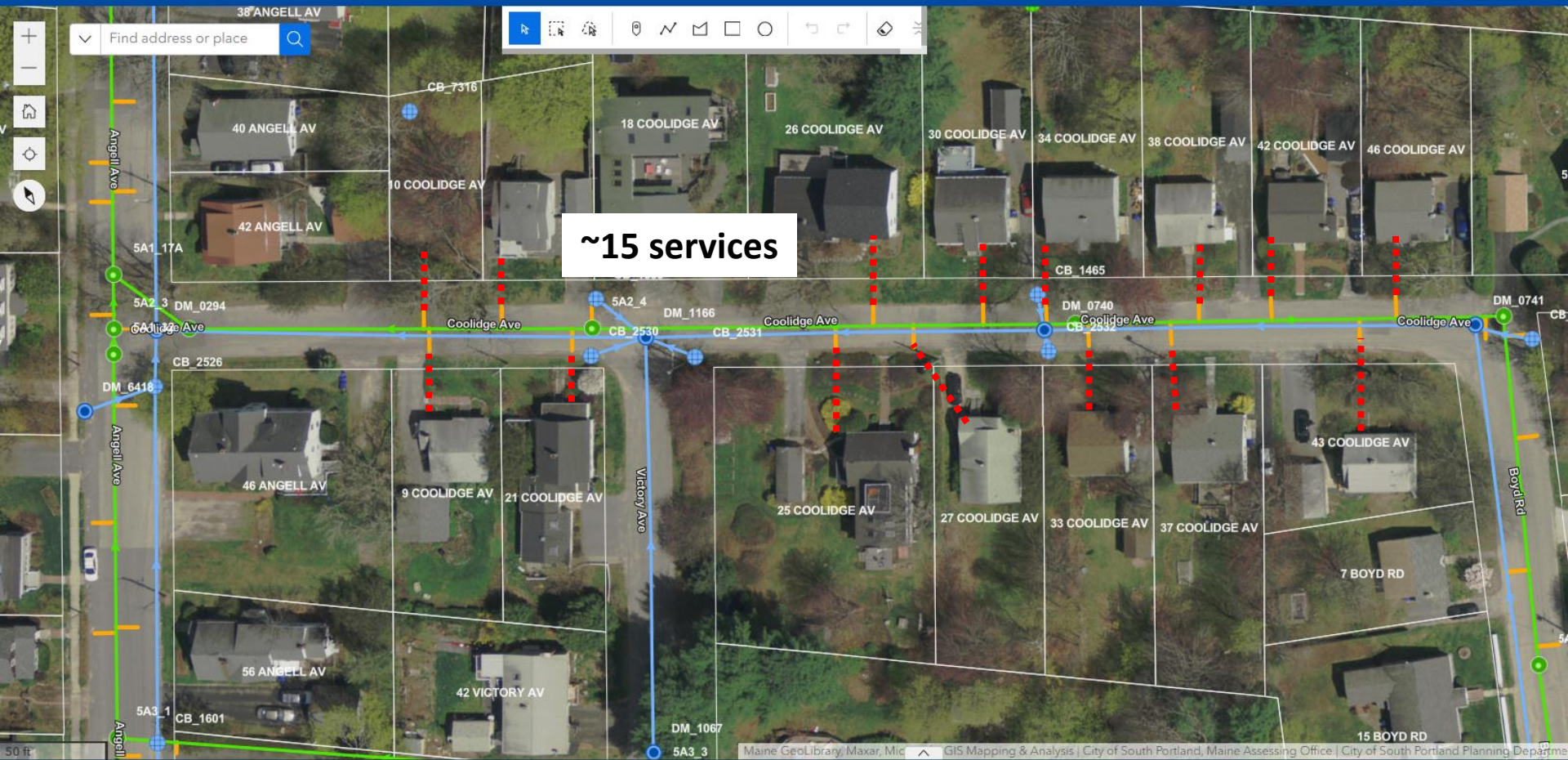
Private Sewer Service Lines

City of South Portland Piped Infrastructure Map



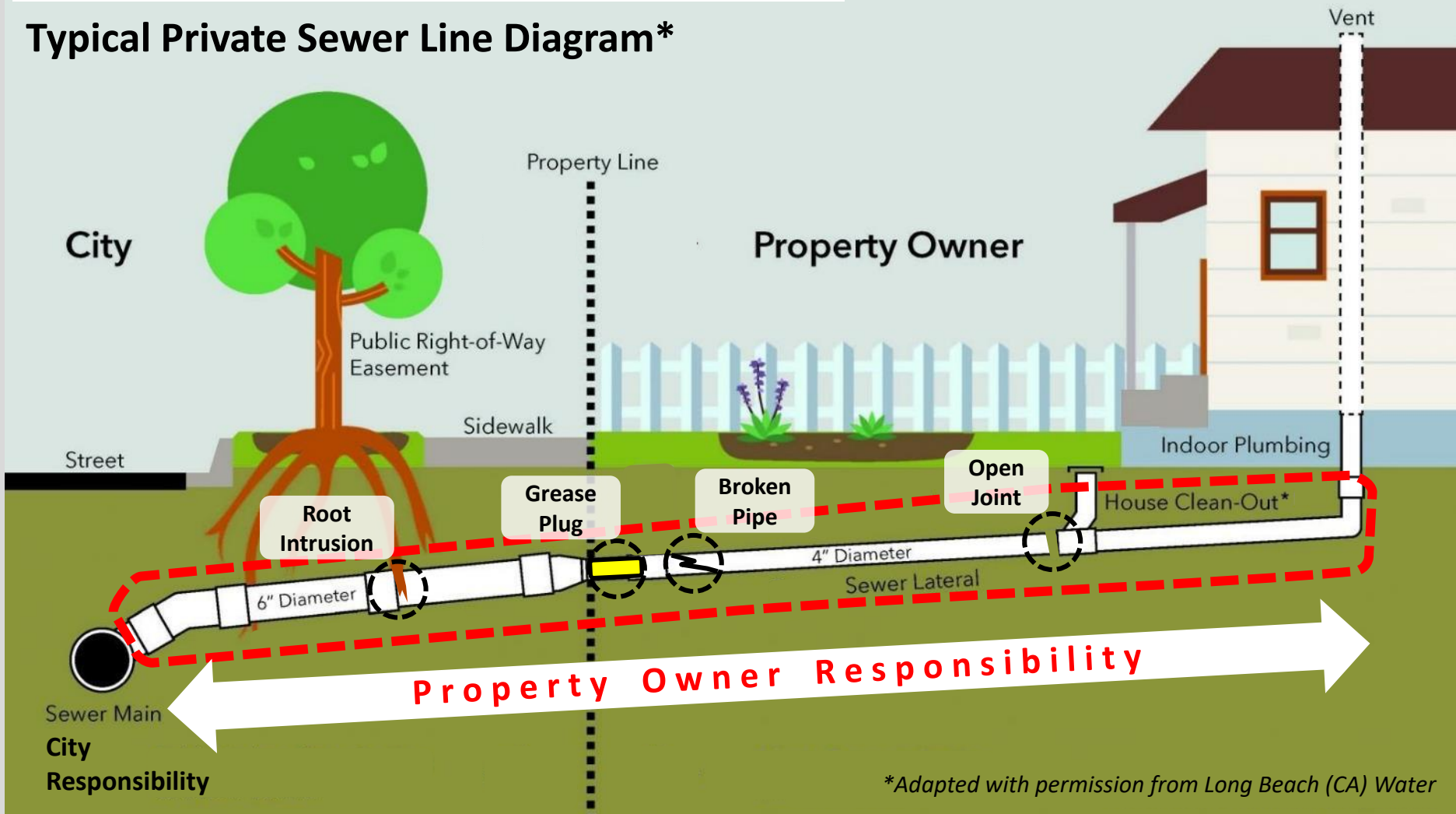
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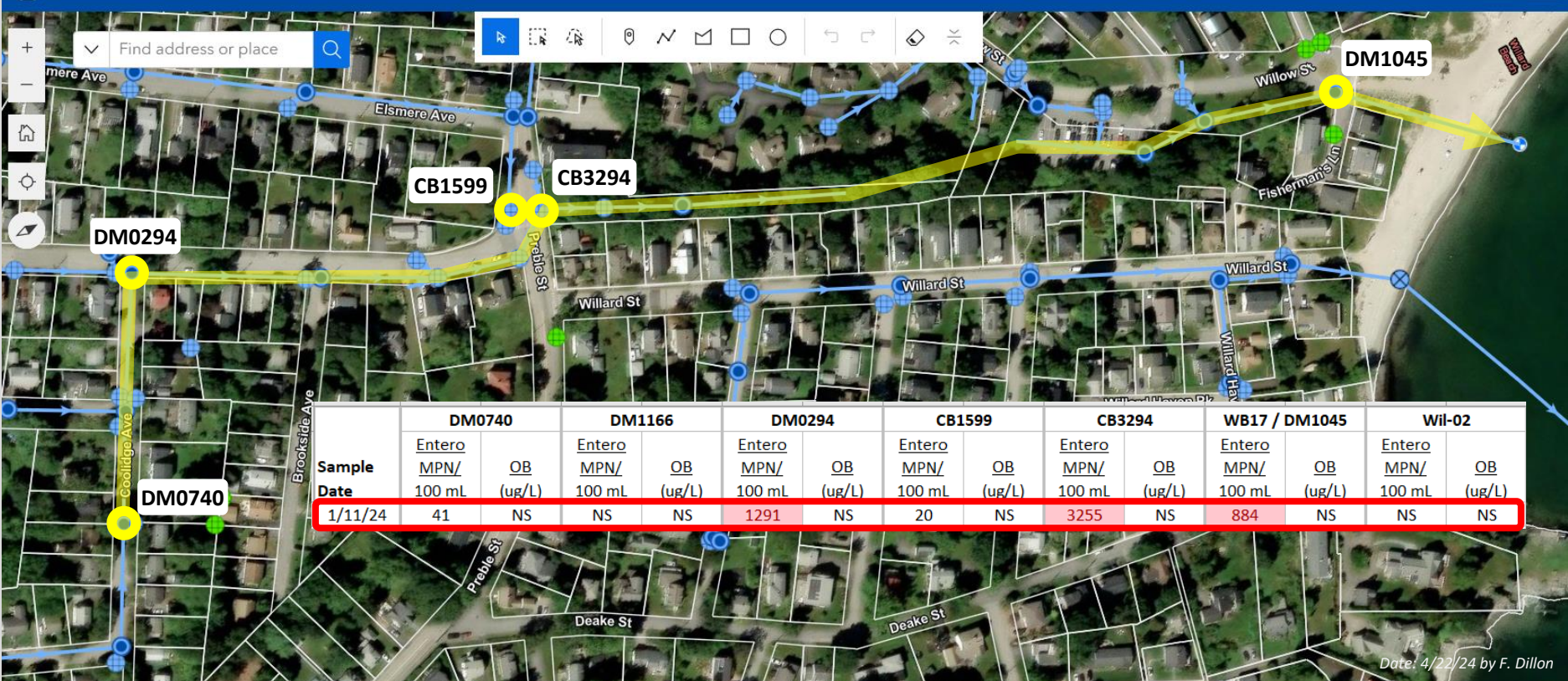


Private Sewer Service Lines

Typical Private Sewer Line Diagram*

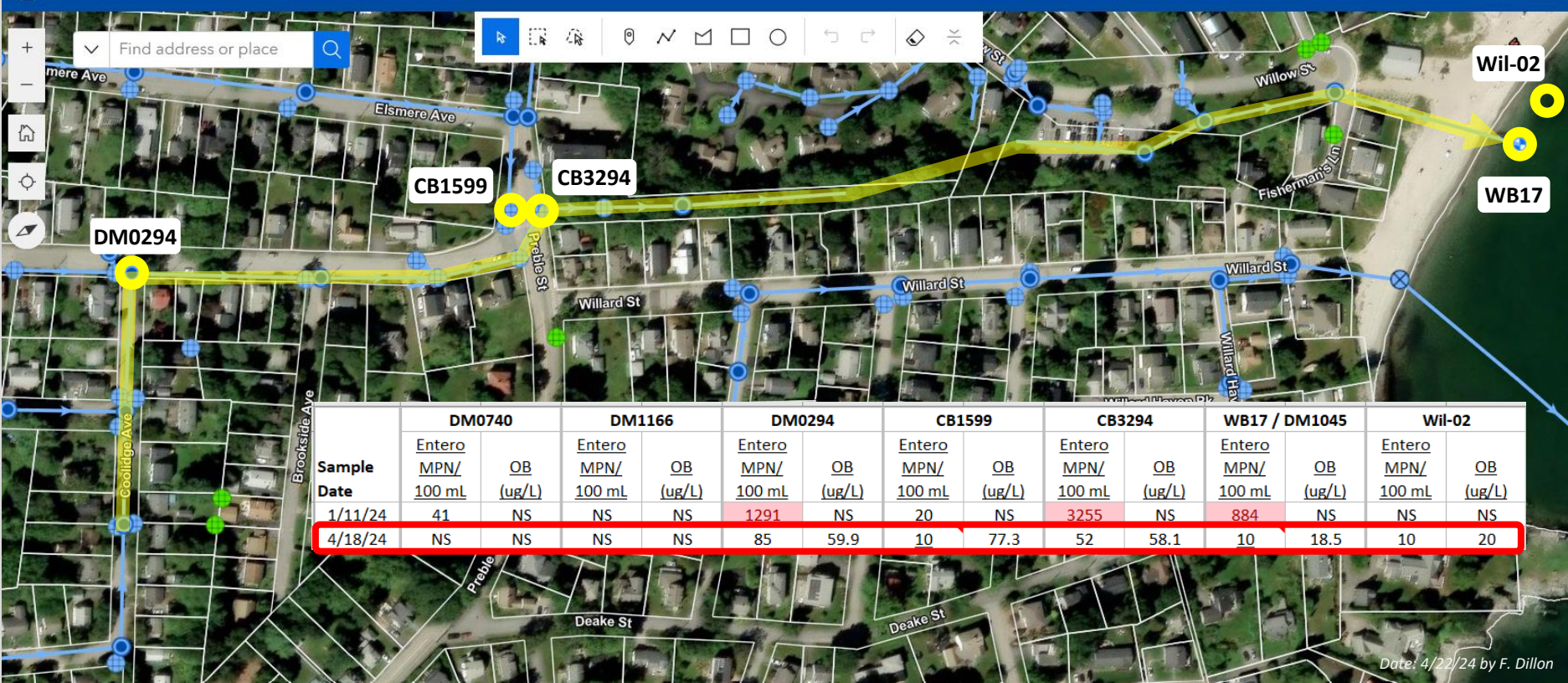


City of South Portland Piped Infrastructure Map - Willard Stormwater System Entero & OB Results – 1/11/24 (2.25" rain)

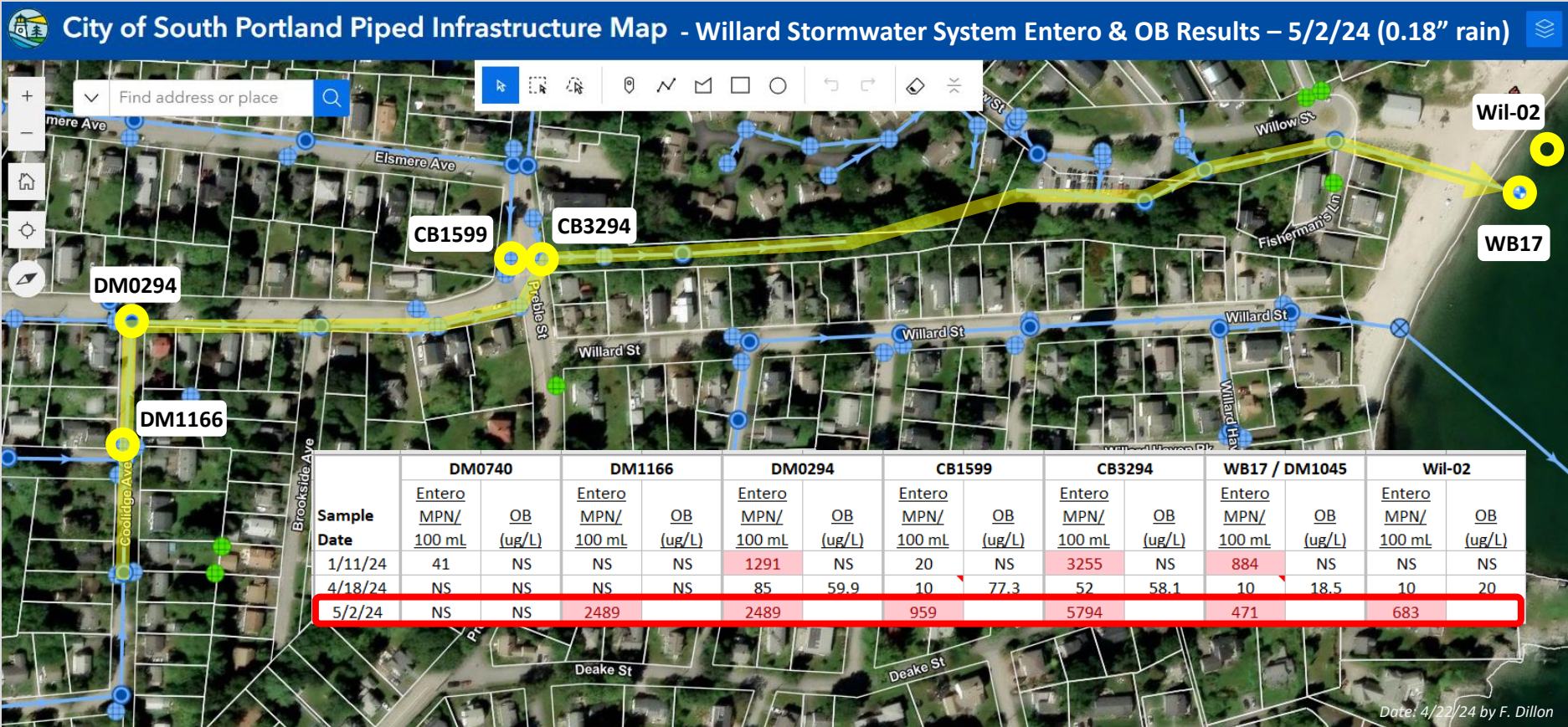


NOTES: rain for prior 48 hr; entero threshold = 104; OB threshold = 100; NS = not sampled; WB17 submerged on 1/11/24

City of South Portland Piped Infrastructure Map - Willard Stormwater System Entero & OB Results – 4/18/24 (0" rain)



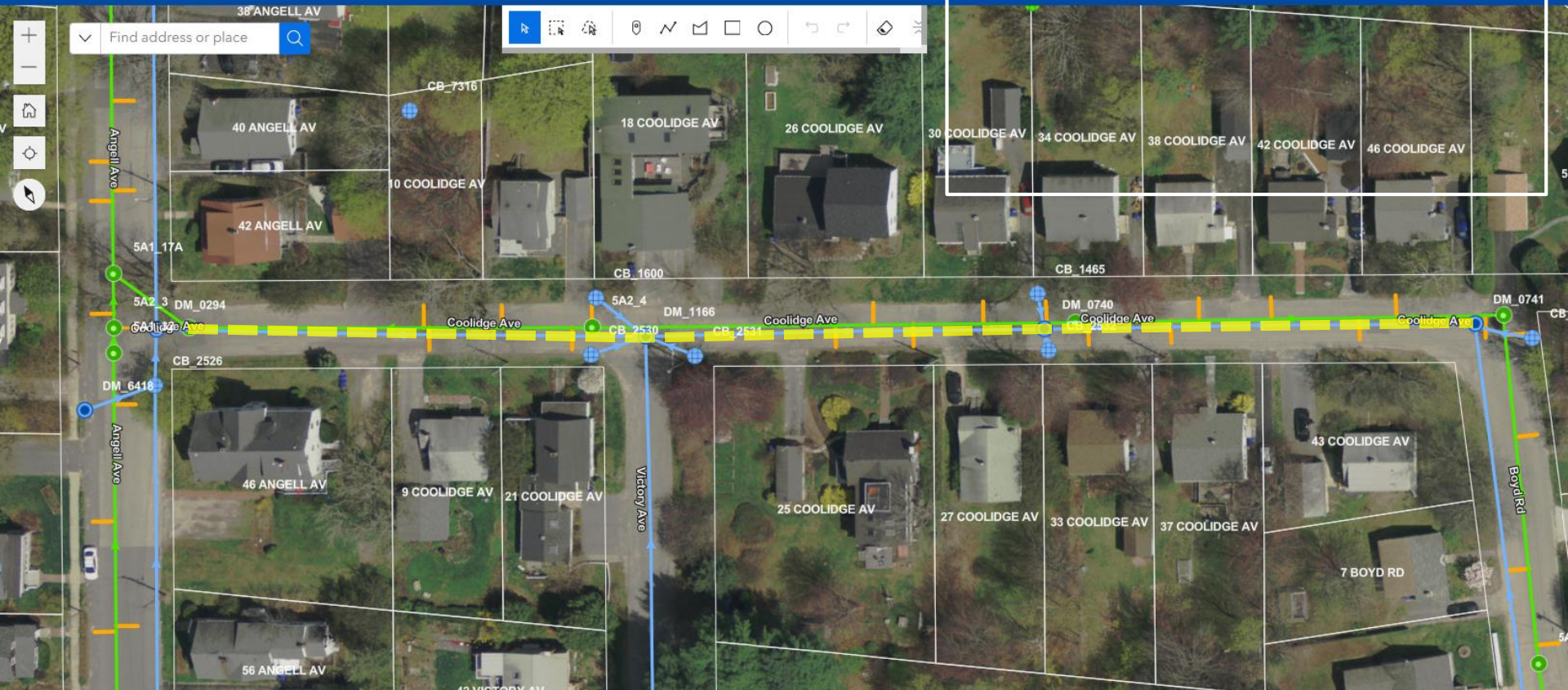
NOTES: rain for prior 48 hr; entero threshold = 104; OB threshold = 100; NS = not sampled; 2 Coolidge sewer segments lined in March 2024



NOTES: rain for prior 48 hr; entero threshold = 104; OB threshold = 100; NS = not sampled; tide nearly completely low when Wil-02 sample collected

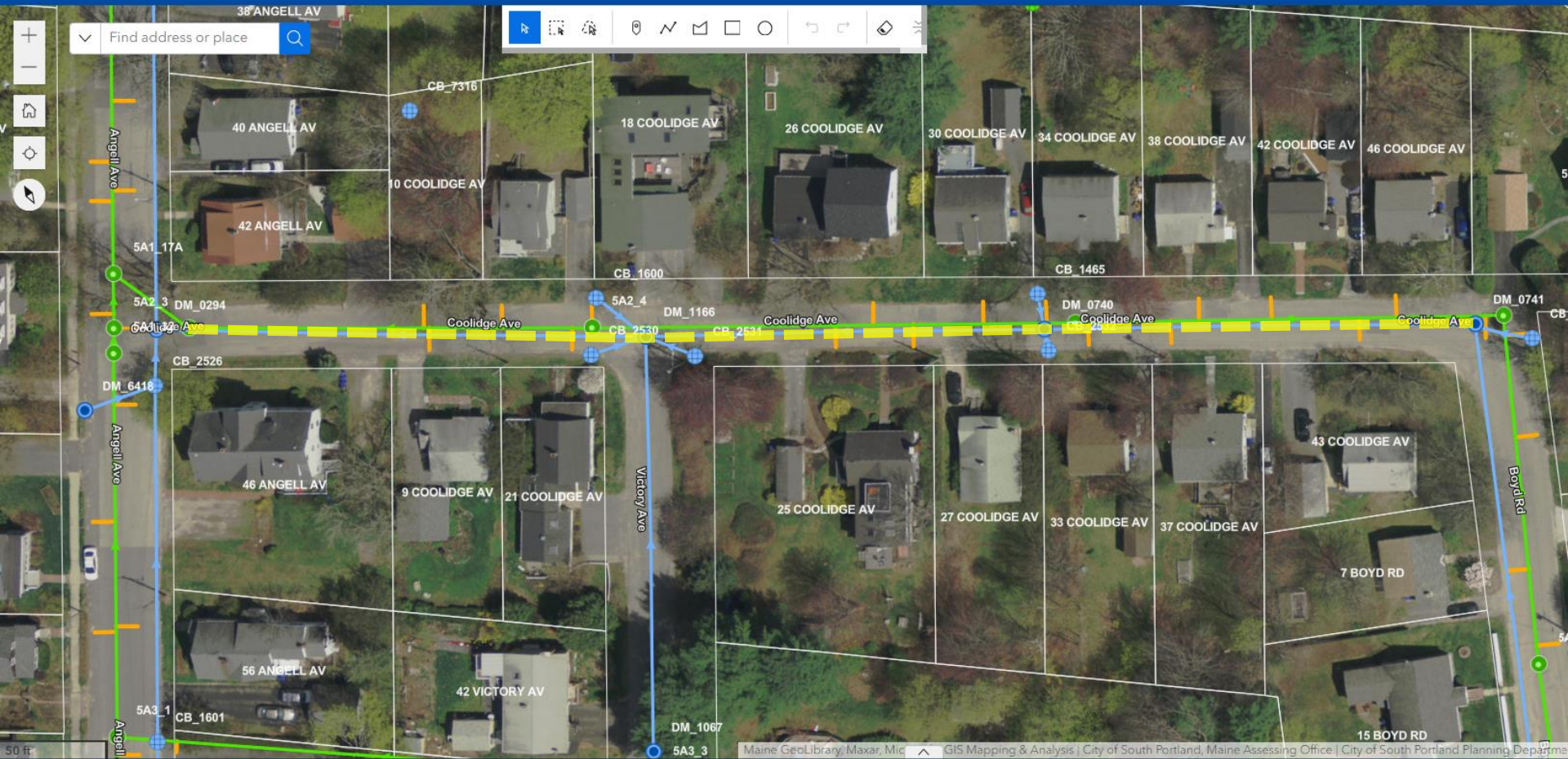
Storm Drain Lining (CWSRF)

City of South Portland Piped Infrastructure Map



Storm Drain Lining (CWSRF) – Fall 2024

City of South Portland Piped Infrastructure Map



ENVIRONMENTAL POLICY
INNOVATION
CENTER

