Diving into Public Notification of CSO Activation, Part 2

March 3, 2021

Charlie Jewell
Director of Planning and Sustainability

Boston Water and Sewer Commission

NEW ENGLAND WATER ENVIRONMENT ASSOCIATION
NEWEA
WORKING FOR WATER QUALITY

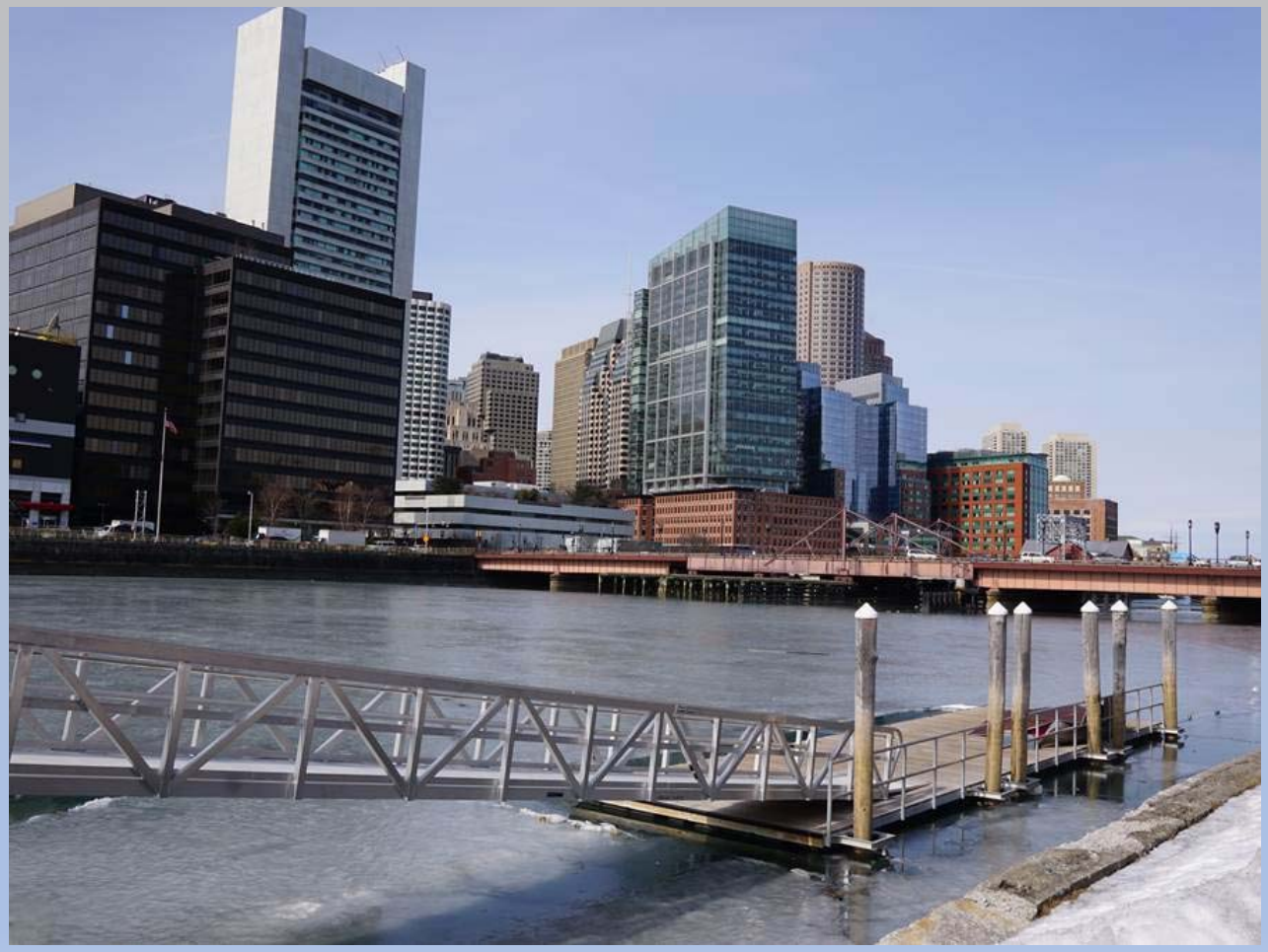
BWSC Collection System

- 1,536 miles of sewer and drain pipes
  - (156 miles combined, 710 miles sanitary, 670 miles storm drain)
- Sewers range from 8 inch to 108 inch
- Drains range from 12 inch to 240 x 186 inch
- 9 pump stations
- 583 outfalls total
  - CSO – 37 permitted outfalls
- 201 tide gates
- 50,605 manholes
- Monitored Regulators - 81

CSO Permit

- NPDES CSO Permit – 2003
- Develop a Public Notification Plan
- Evaluation of further measures to enhance the public notification program
  - Signage
  - Posters

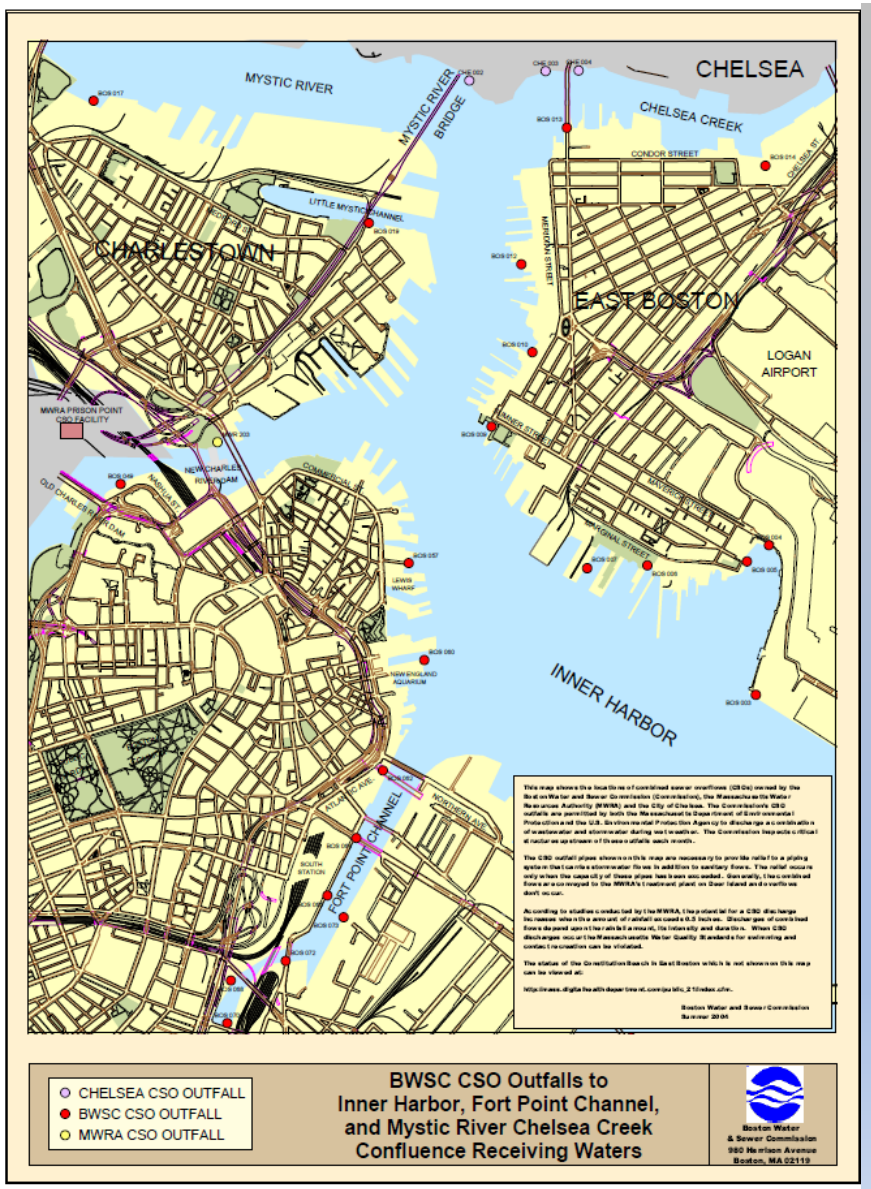
Fort Point Channel between Downtown Boston and South Boston

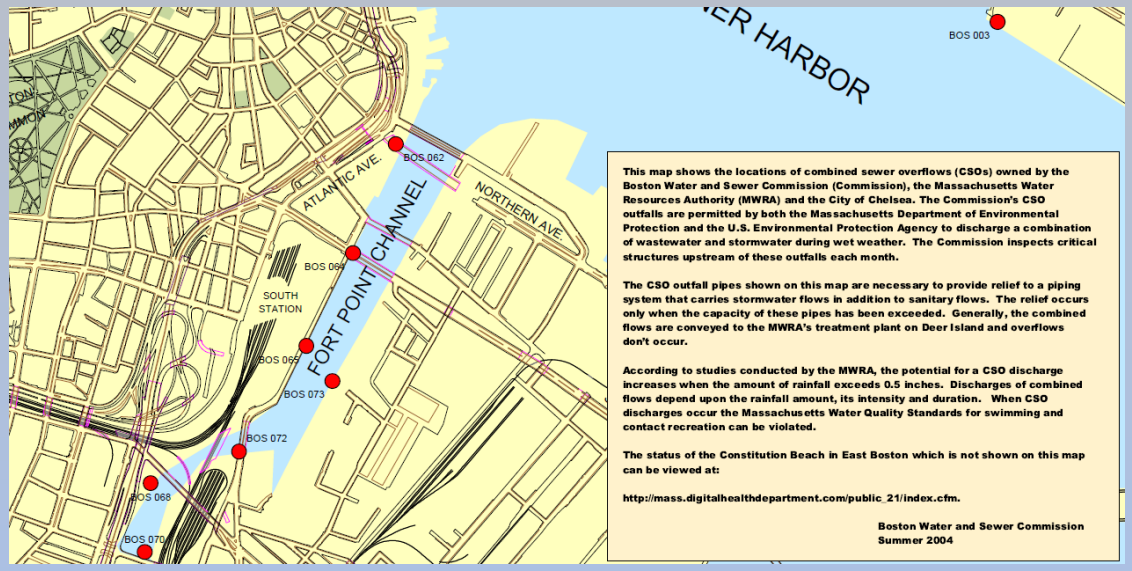


Area of extensive public access and utilization


B.W.S.C.
WET
WEATHER
SEWAGE
DISCHARGE
OUTFALL
091

Public Notification - 2004

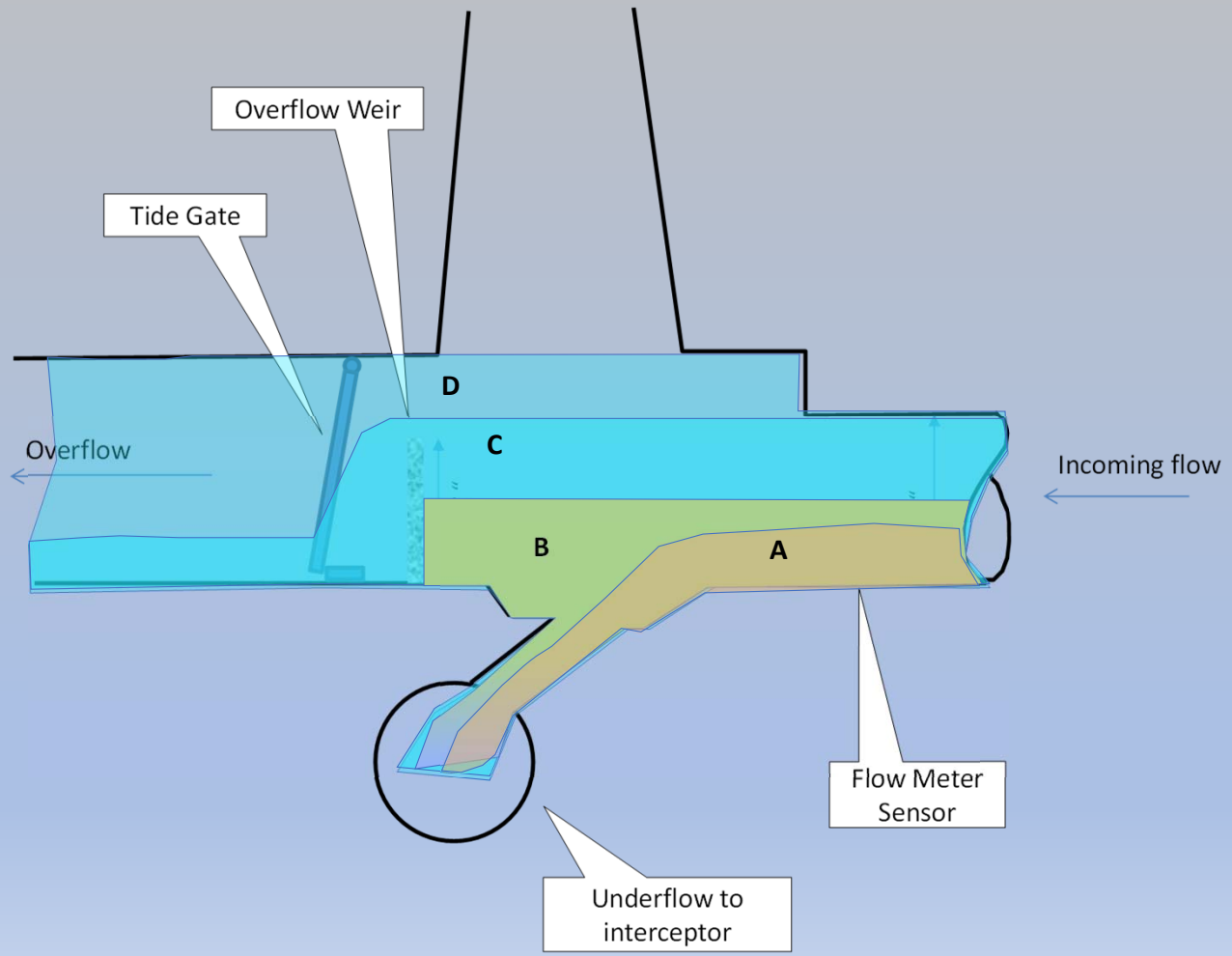


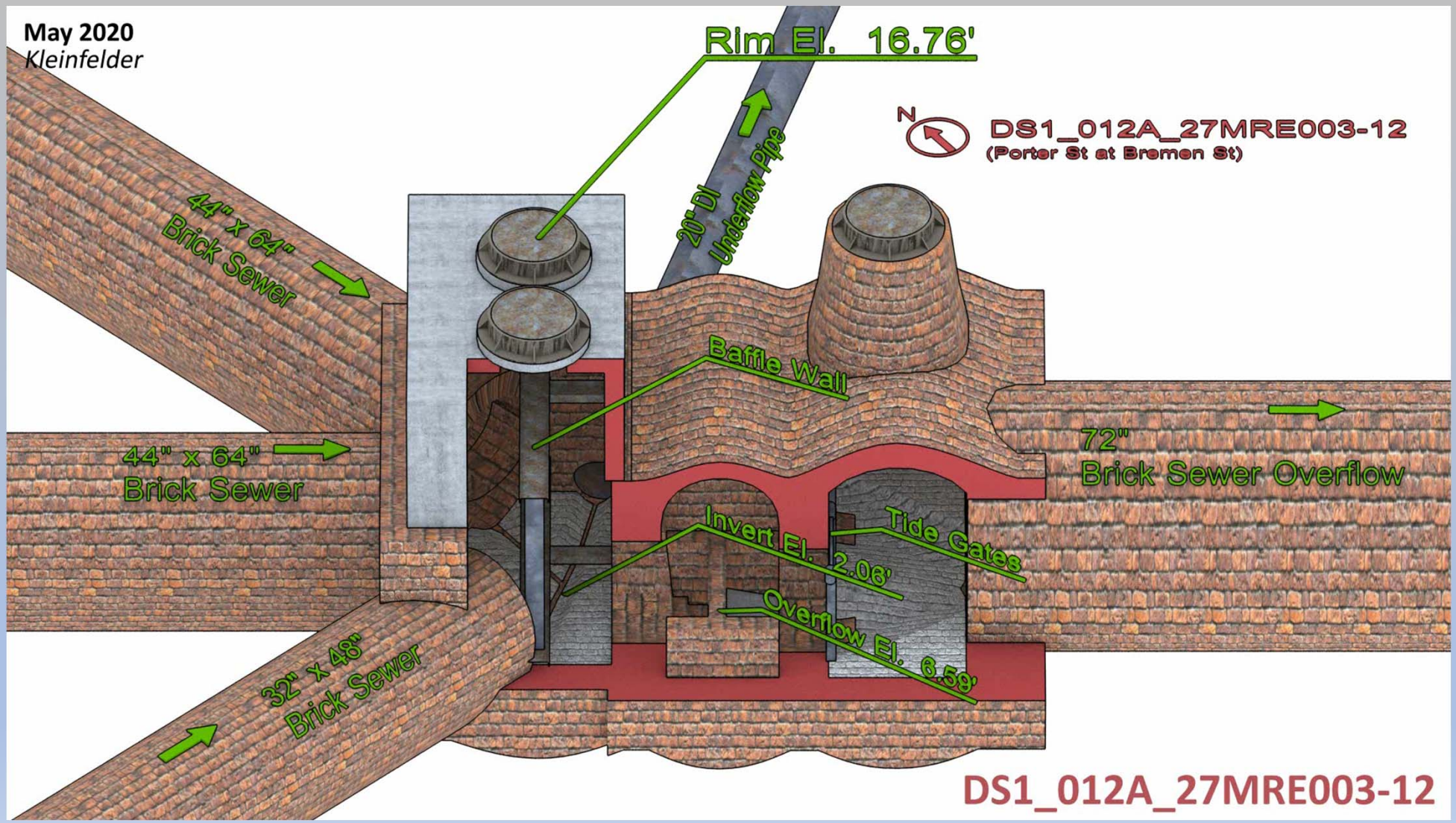


Pilot Projects 2015-2018

- Web Site Development
  - Ten Regulators identified
  - Develop mock-up of web site
  - Feed – back – “Confusing”
  - Next Phase – Five Regulators
  - New Mock-up - Simple

Four Hydraulic Conditions of Combined Sewers




May 2020
Kleinfelder
Rim El. 16.76'
N
DS1_012A_27MRE003-12
(Porter St at Bremen St)
20" DI
Underflow Pipe
44" x 64"
Brick Sewer
Baffle Wall
44" x 64"
Brick Sewer
72"
Brick Sewer Overflow
Invert El. 2.06'
Tide Gates
Overflow El. 6.59'
32" x 48"
Brick Sewer
DS1_012A_27MRE003-12

Current Project

- Started 2018 – 2019 – Legislation Proposed (Signed by Baker, Jan. 2021)
- Three-year contract – All Regulators that impact water bodies
  - Inspect regulators selected for monitoring
  - Identify the type of sensors and proposed placements
  - Develop algorithms for event notification
    - Define event criteria (15 min delay, interevent duration)
  - Develop communication between sensors, database and web site
  - Store data on a remote server
  - Provide maintenance and calibration needs – monitor data 24/7
  - Utilize FlowWorks to present data on web site

CSO Monitoring Inventory

81 - Regulators

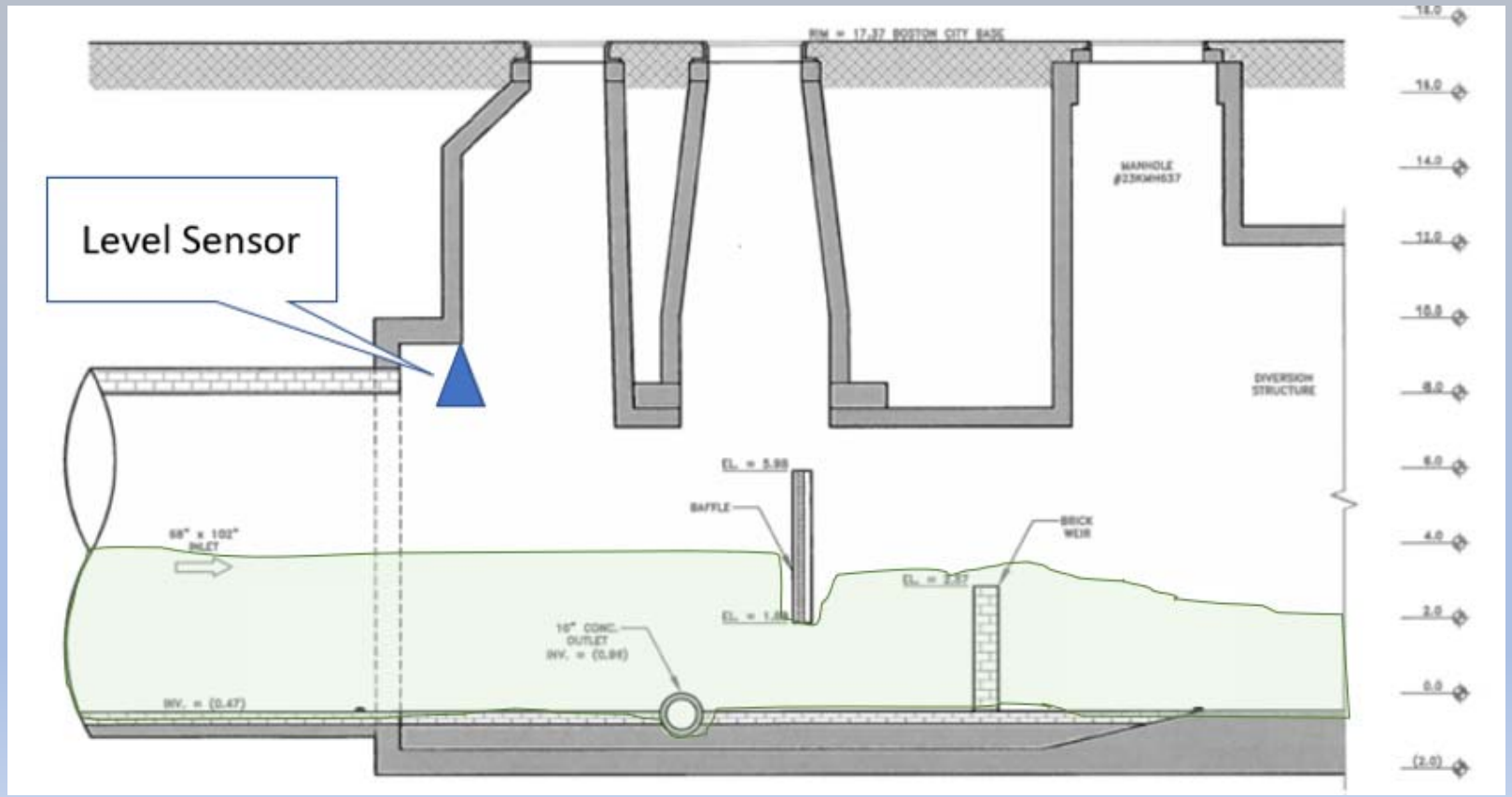
31 - Level Only Meters

57 - Area Velocity Flow Meters (7 locations require multiple meters)

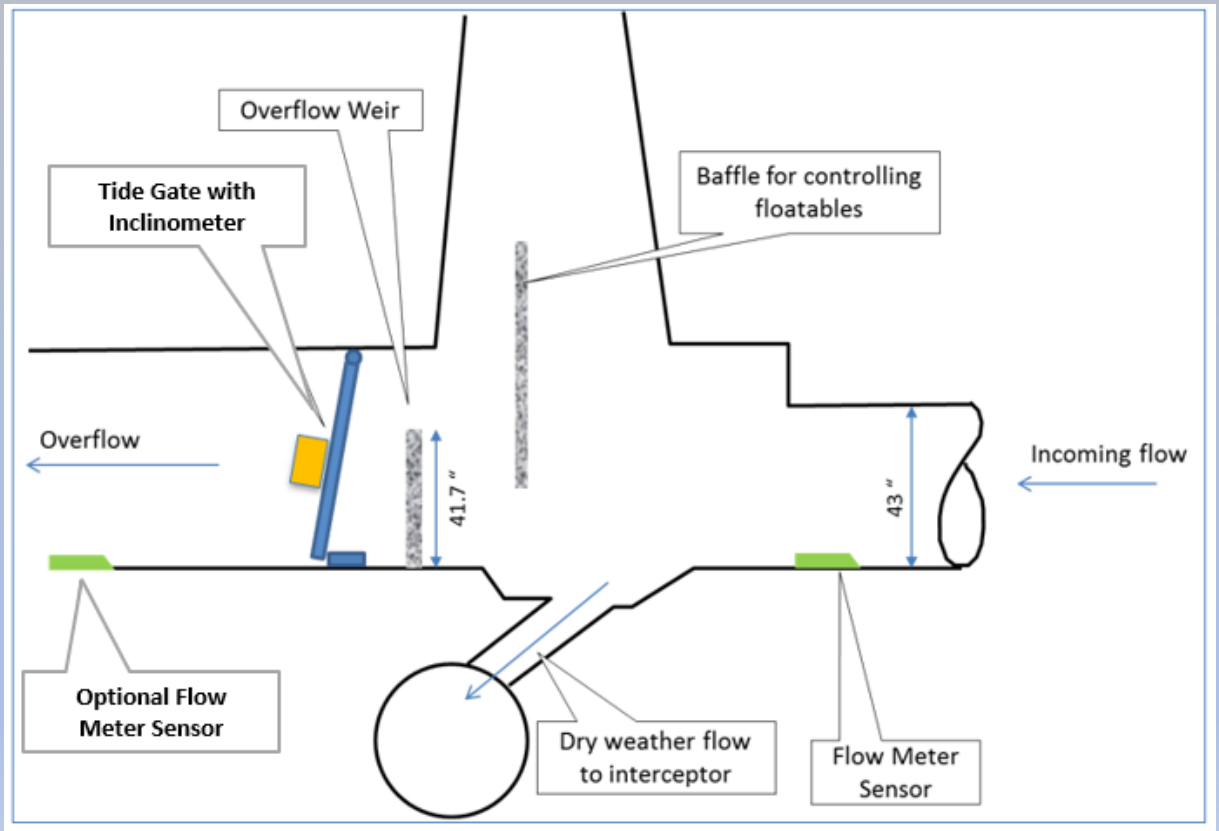
16 - Inclinometers on Tide Gates

12 - Boston rain gauges (10 in house, 2 by ADS)

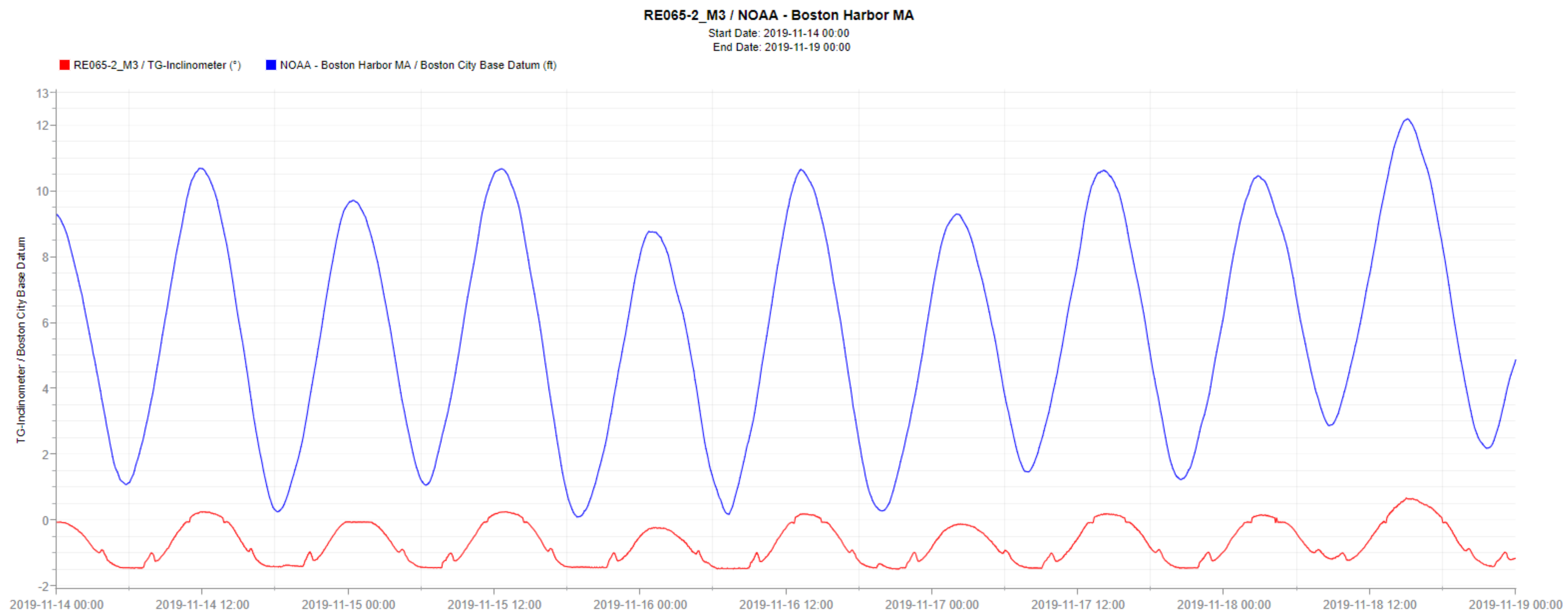
Example CSO Regulator – Simple



Example CSO Regulator – RE070/8-3



Iqfdqrp hwhu#v1#Wlgh

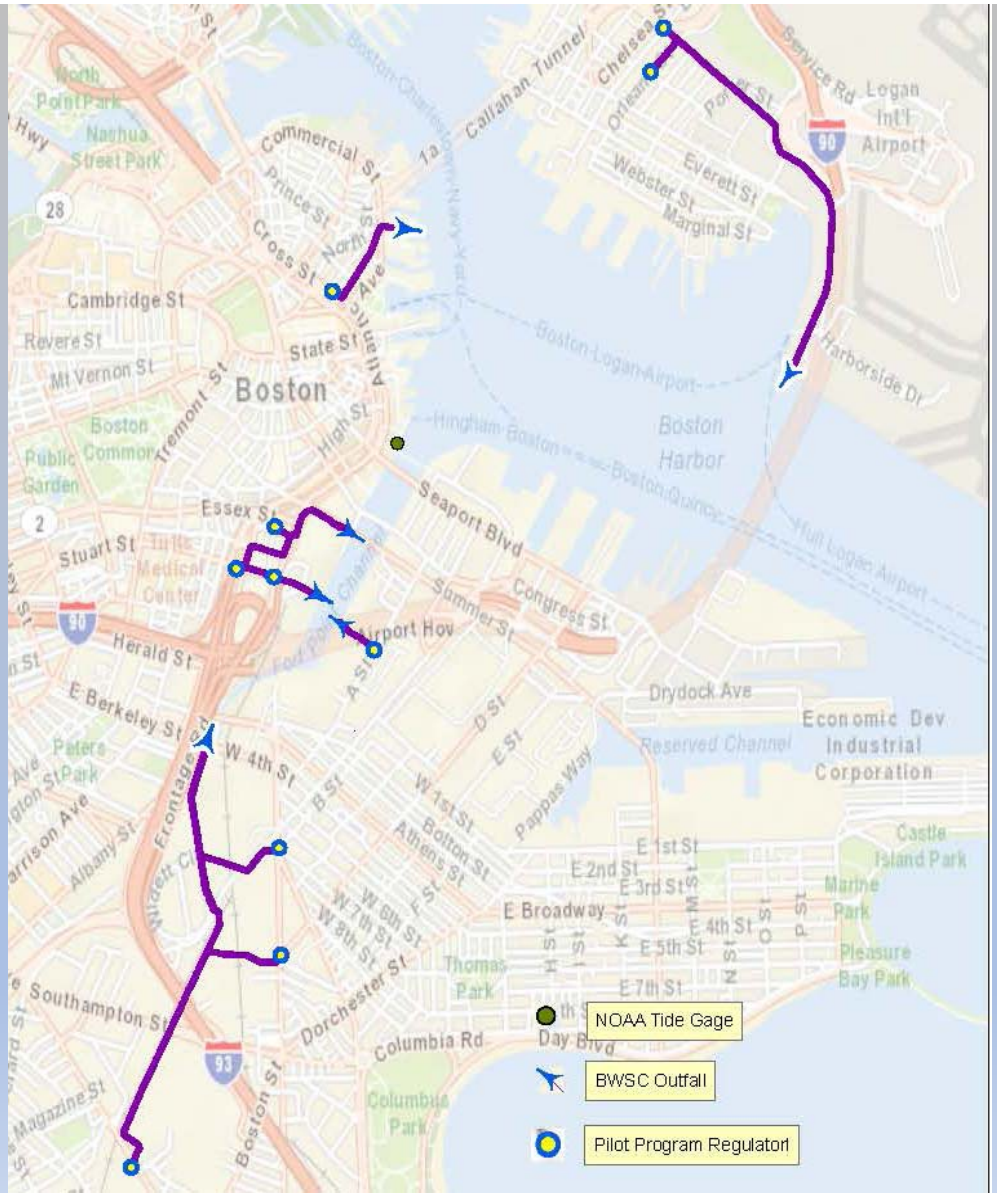


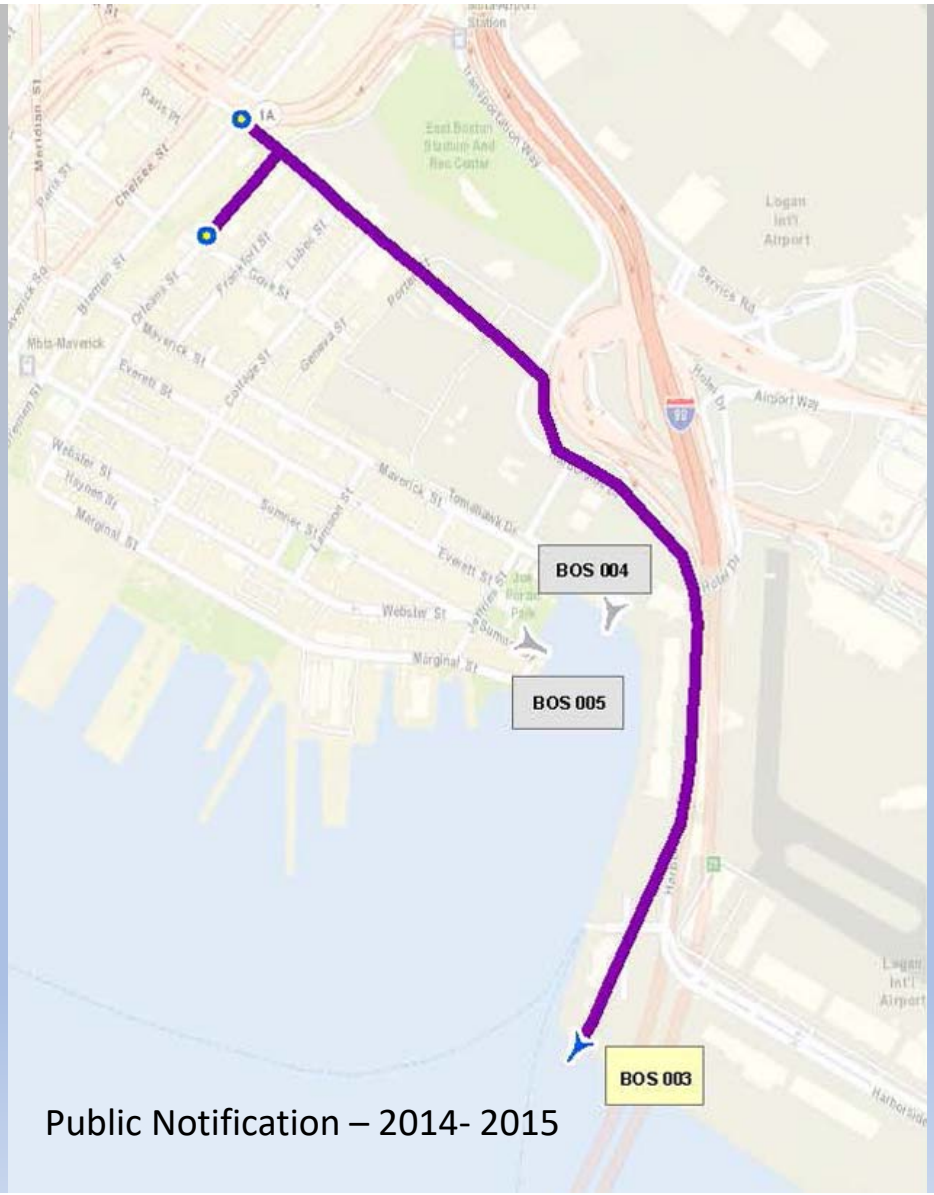
Lqfdqrp hwhu#yv1#Wlgh

Realtime Overflow Equations

- Boolean equations (If/Then) – Required to minimize false alarms
- Example (Complex) **If** combined sewer level > weir level **and** inclinometer movement > 3 degrees **then** report Overflow
- Example (simple) If combined sewer level > weir level then report overflow
- 15 min delay to filter out odd sensor readings that may cause false alarms
- System is fully automated and real-time
  - (Data transmission hourly)
- Scalable for additional locations and volume if required

Simple Data Example – Need for filters



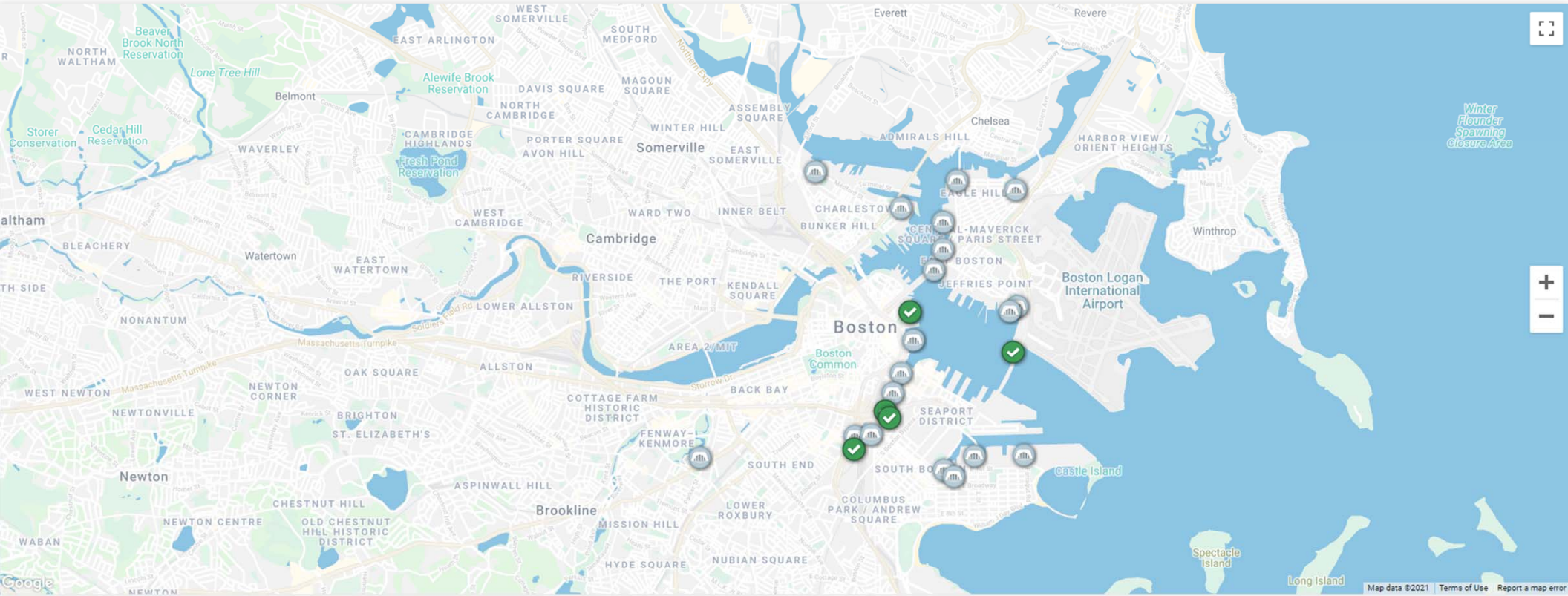


Public Notification – 2014- 2015

CSO Notifications

Boston Water and Sewer Commission

Public Notification – 2016-Present



Legend

- No Overflow
- Overflow in past 24 hrs
- Overflow in past 2 hrs
- Not Monitored

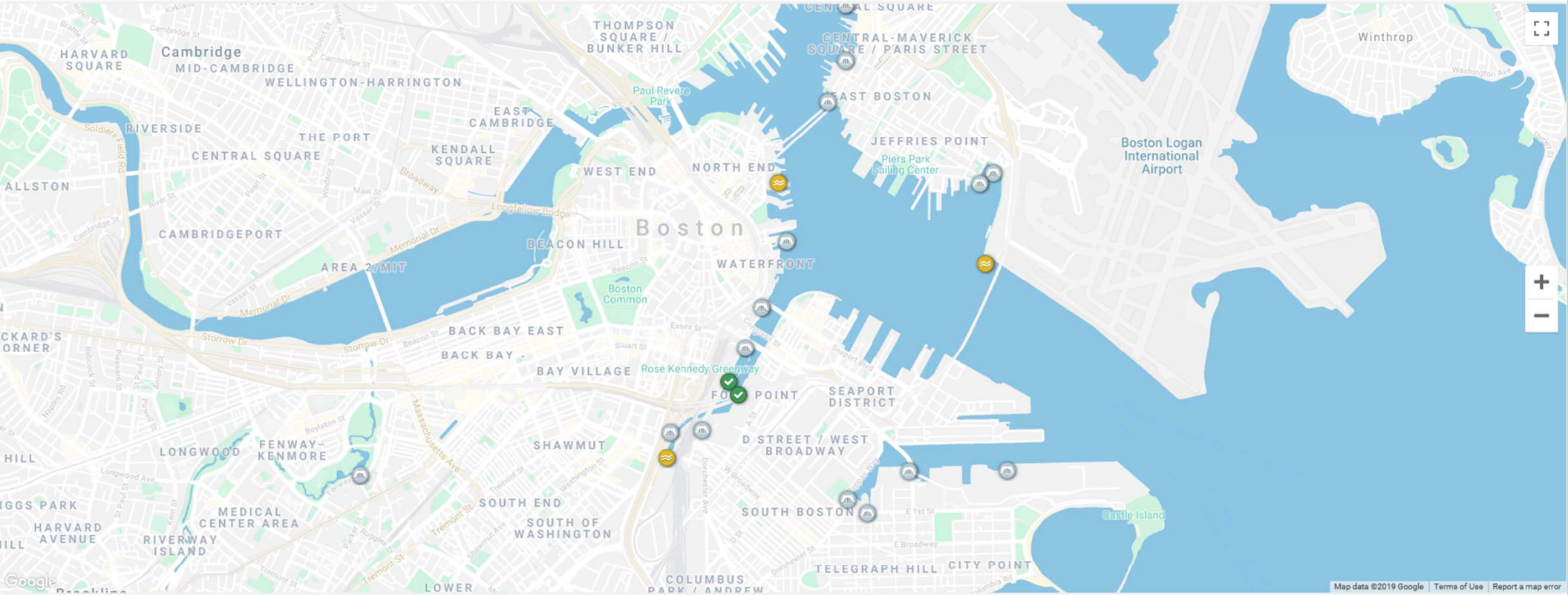
www.bwsc.org
CSO Public Notification

FlowWorks
Actionable Insights. Smart Decisions.
Learn more at flowworks.com

The Combined Sewer Overflow (CSO) Notification Maps provided by the Boston Water and Sewer Commission (BWSC) are based on available, calculated estimates of CSO flow and activity. BWSC does not guarantee the accuracy of these records and maps, which shall be used for the sole purpose of providing information and awareness to the public with respect to actual or suspected CSO activity. BWSC reserves the right to alter, amend or terminate the display of these records and maps at any time.

CSO Notifications

Boston Water and Sewer Commission

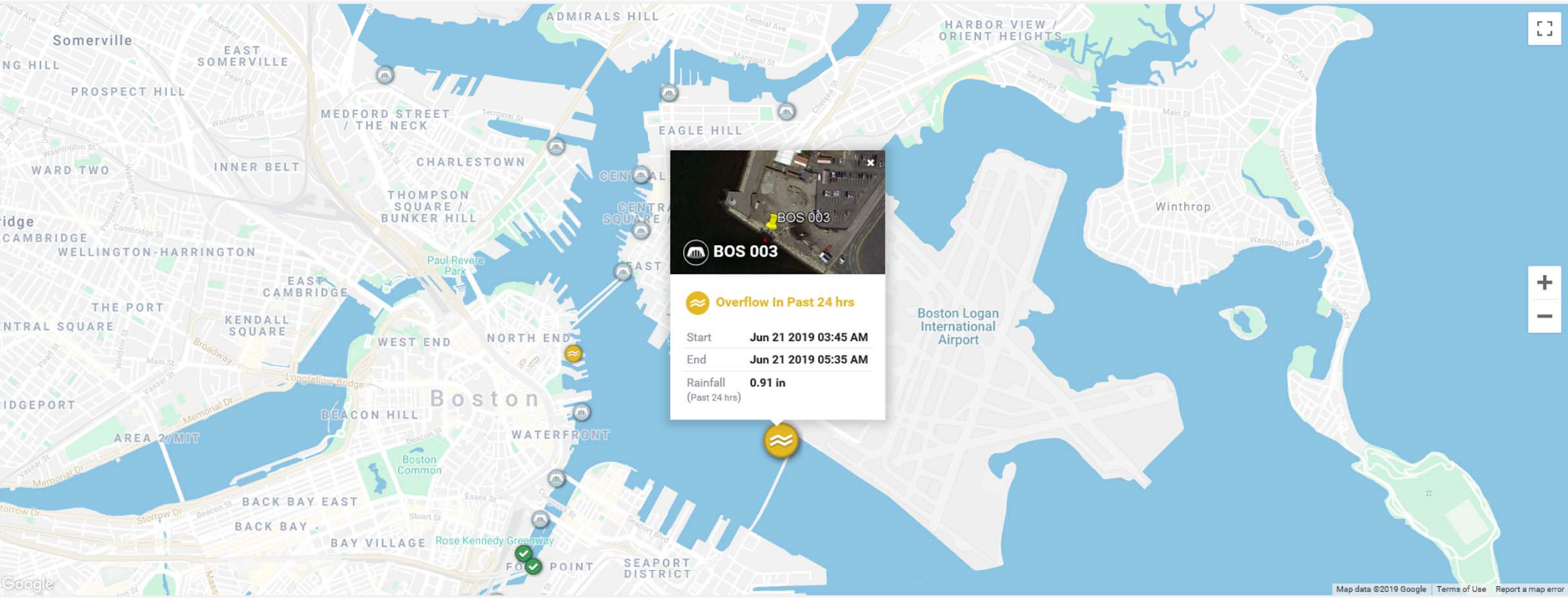


Legend

- No Overflow
- Overflow in past 24 hrs
- Overflow in past 2 hrs
- Not Monitored

CSO Notifications

Boston Water and Sewer Commission



Legend

- No Overflow
- Overflow in past 24 hrs
- Overflow in past 2 hrs
- Not Monitored

Questions – Put in Chat

JewellC@bwsc.org