DHI Group

Eric Fontenot

Head of Department, Urban Water

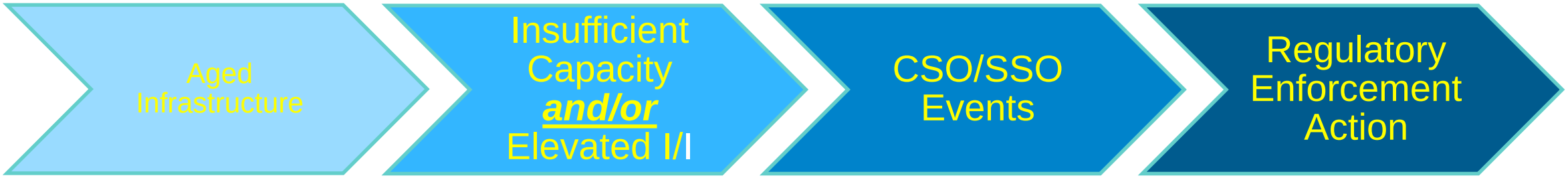
Collection System Asset Optimization
Westchester Water Symposium

Eric Fontenot, PE
Head of Department, Urban Water

DANISH CLEANTECH HUB
DHI

Problem Statement

- Out of compliance with CWA



  - High cost of compliance via traditional sewer rehab & replacement
    - Prescribed SSES – miles of sewer surveyed/YR
    - Increased treatment and storage
  - How can obligations be met & maintained as reasonable costs?
    - Optimization – doing more with less

DANISH CLEANTECH HUB

DHI

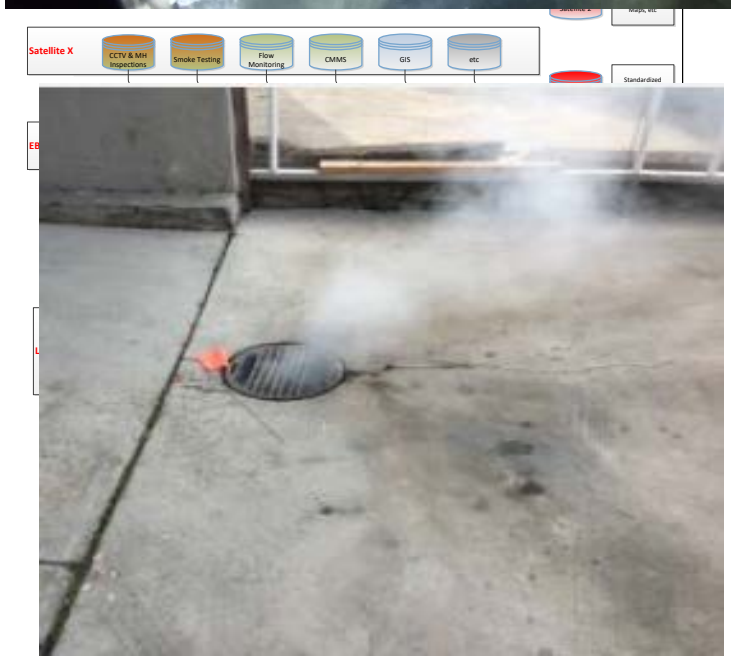
Considerations in Optimization Planning

- What is the end objective?
  - Assuming compliance with Consent Decree and CWA
- Terms of Consent Decree?
  - Basis of level of service mandated for compliance
    - Prescribed rainfall event: EPA moving away from design storms
    - Number of allowable events: are you planning for climate change?
  - Required inspection and maintenance schedules
  - Length of time allowed to achieve compliance
    - Timing may favor some optimization options over others

Optimization

- Optimizing Data: information to understanding
  - Collection, management, analysis, decision making

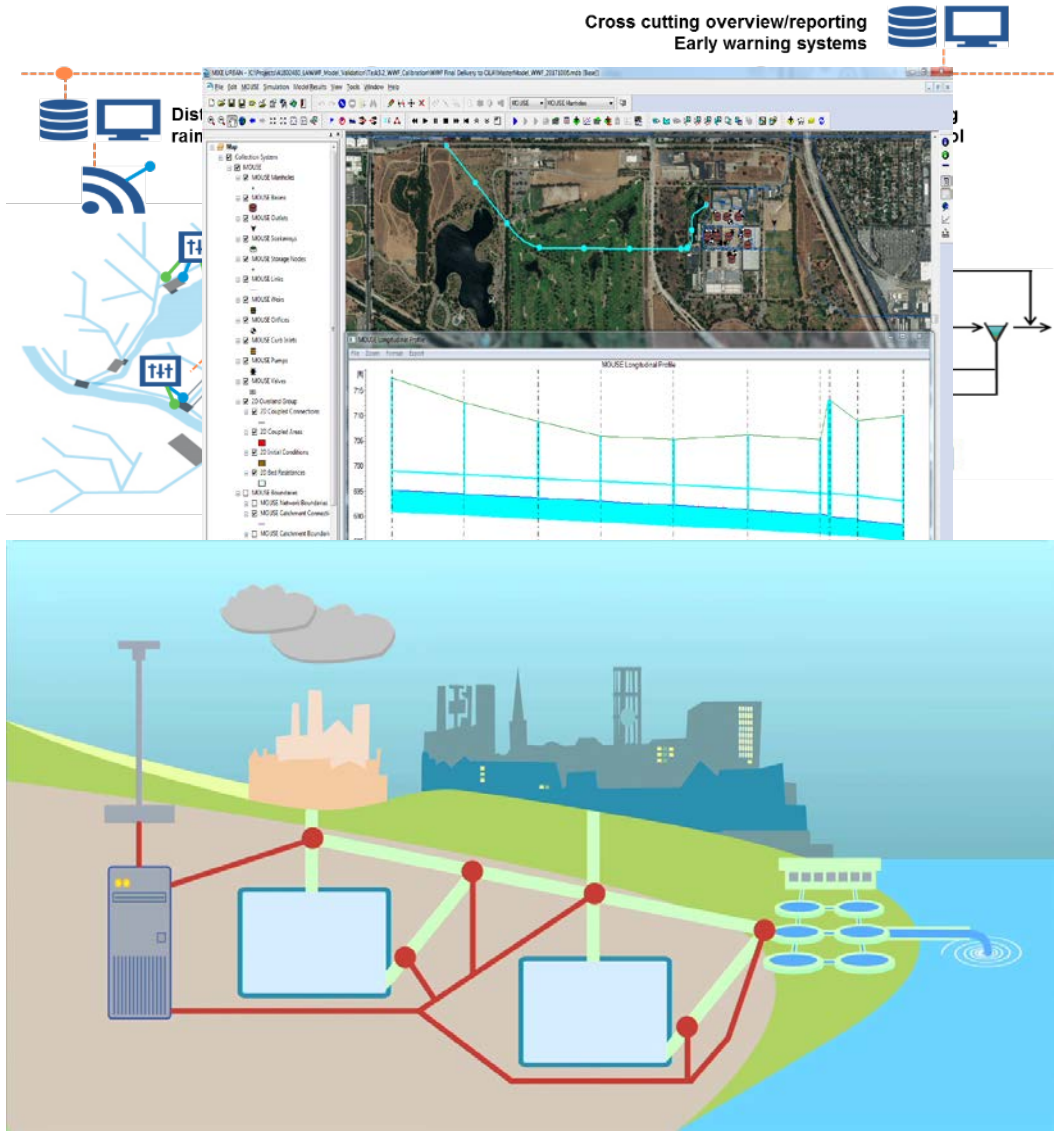
- Asset Management: Prioritizing I/I reduction
  - Public assets: I/I source identification and correction
  - Private assets: Estimates of 50% inflow originates from PSLs
  - New facilities planning



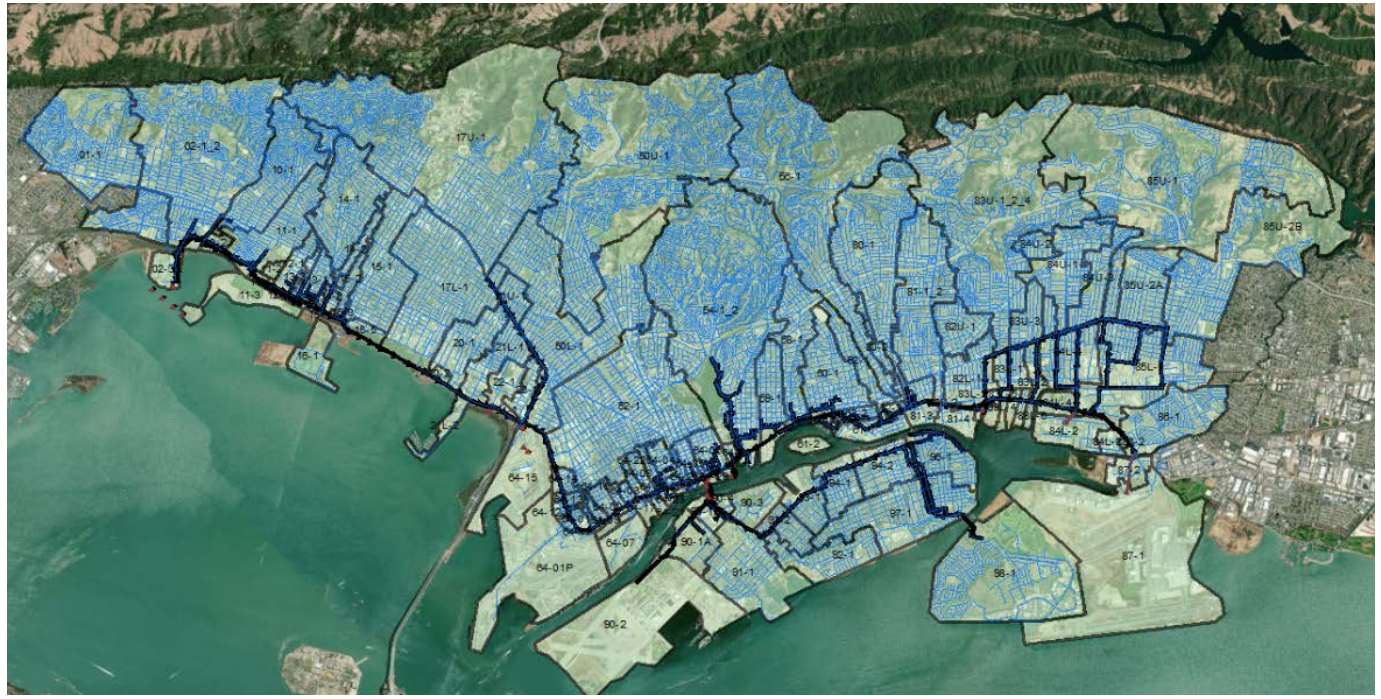
Optimization

- System Capacity
  - Flow reductions → ties directly to optimized asset management
  - Flow management → increased capacity, storage, hydromodification

- System Operations
  - Synching system utilization with rainfall patterns
  - Pumping operations
  - Diversion and storage

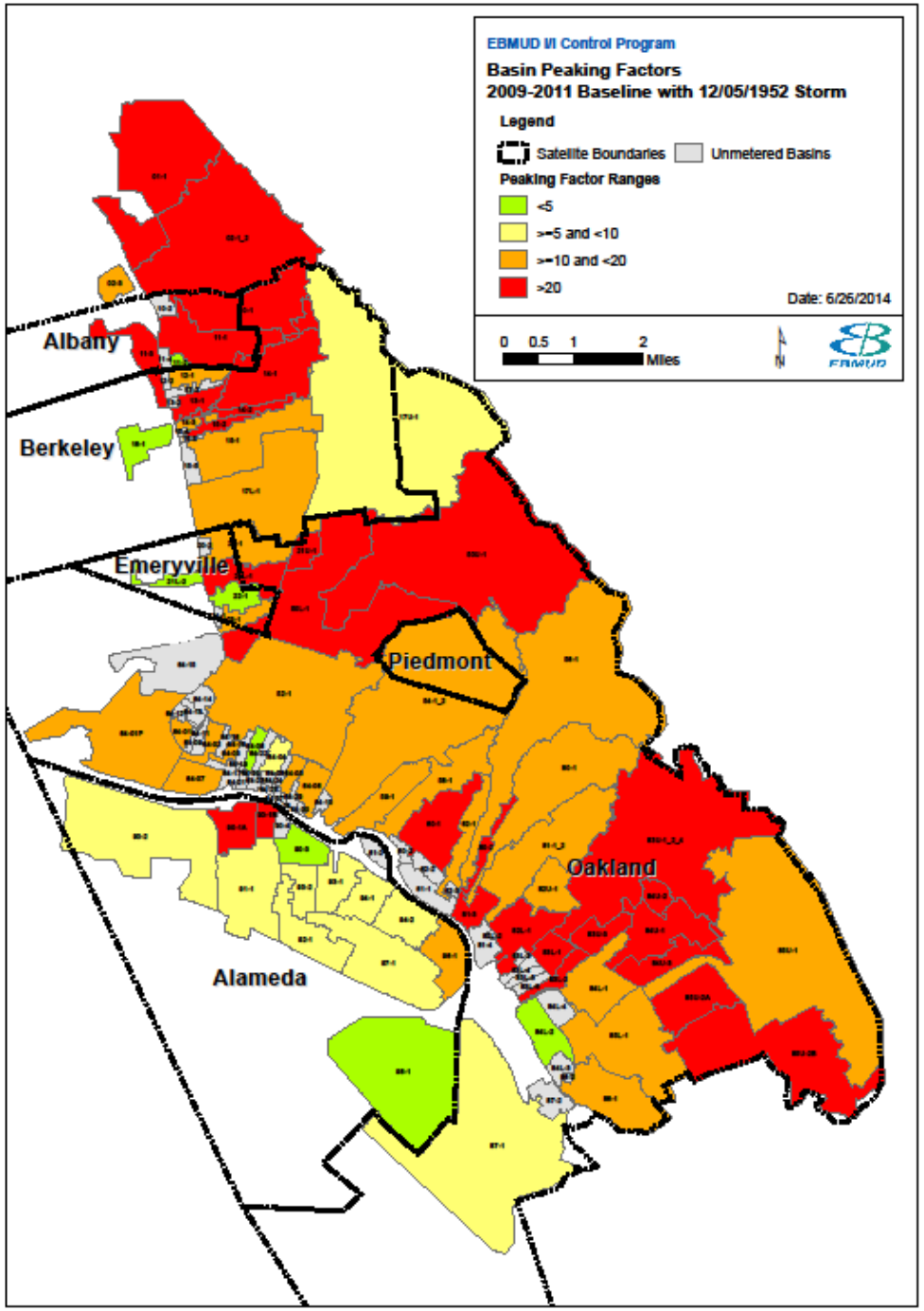


Case Story - EBMUD



Average Dry Day Flow: 50 MGD

Wet Weather Flows: > 650 MGD



Case Story - EBMUD

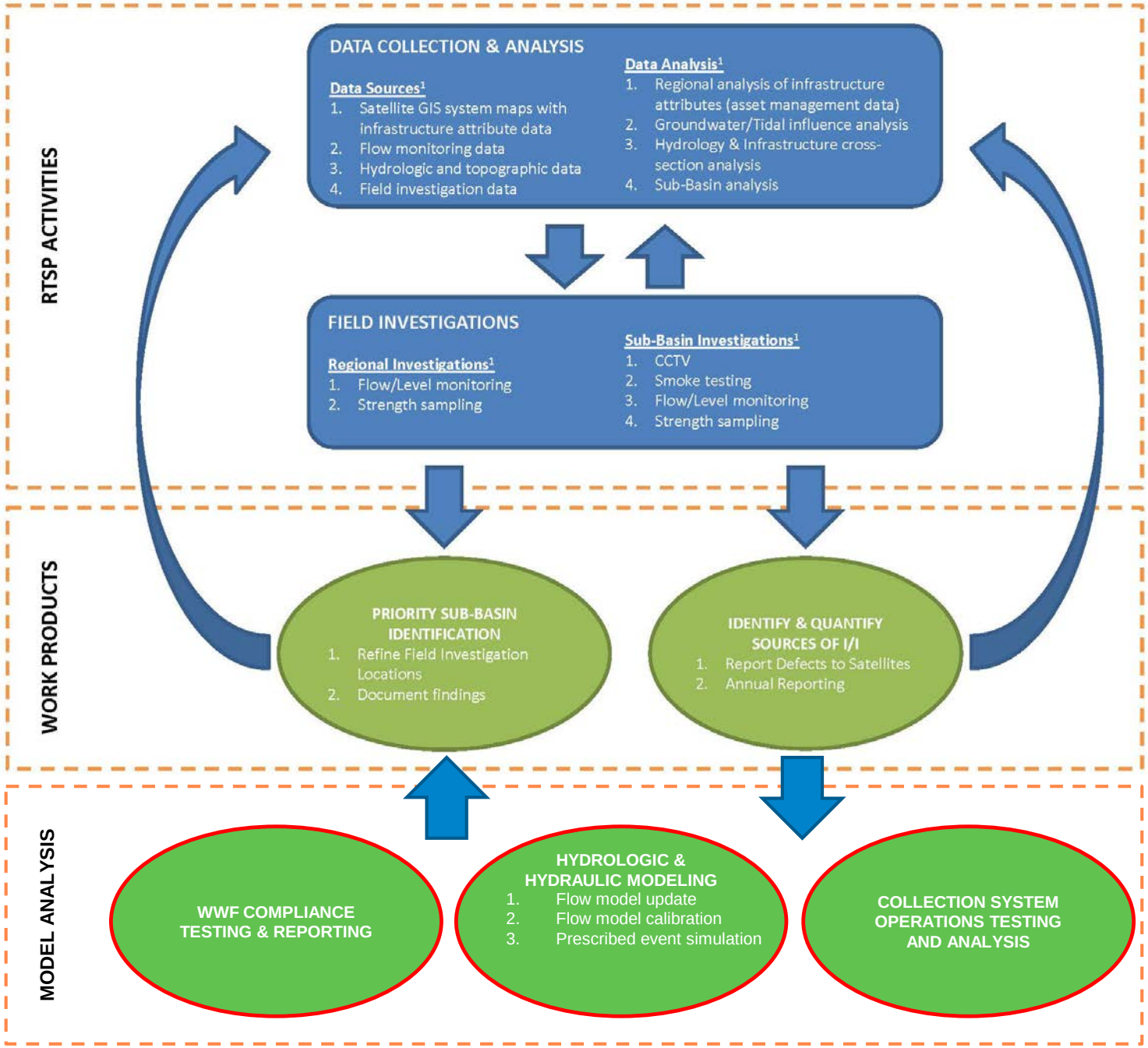
Regulatory Timeline

3 WWFs Permitted	WWF Permit Remanded	EBMUD Stipulated Order	Satellite Stipulated Order	EBMUD + Satellites Consent Decree
Late 1980s	2007	2009	2011	2014

- CD specifies WWF discharge reduction and elimination targets
  - Strong focus on asset management and systems operation
  - Notable change from historical approach of treatment and/or storage

Structure of CD affords optimization opportunities

Case Story - EBMUD

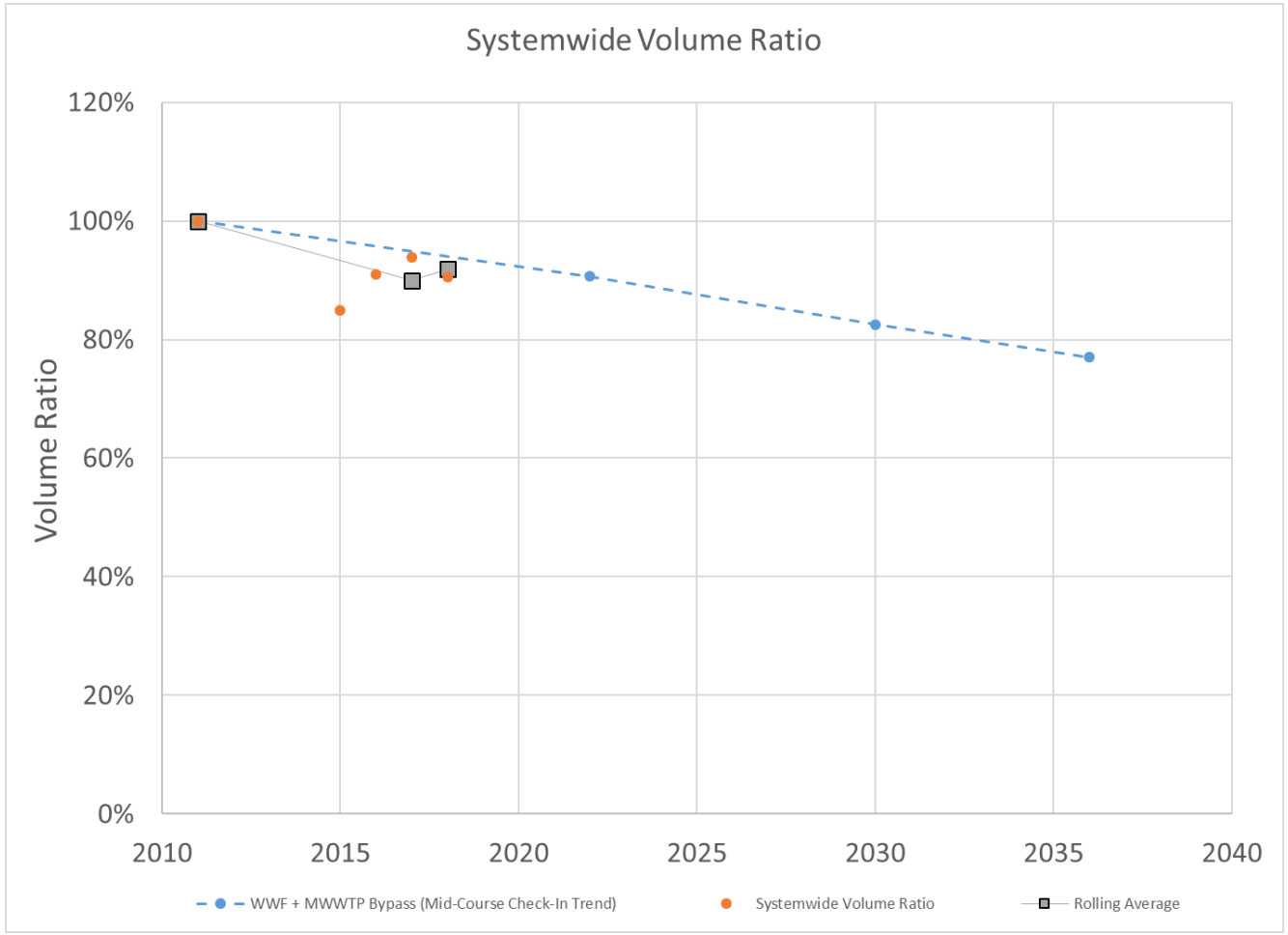


Case Story - EBMUD

System Operations

- Numerical modeling: test and refine system operations
- PSQ reversal strategy
  - Planning and design support
- Planned active in FY2020
- Reduced wet weather volume load at Point Isabel WWF

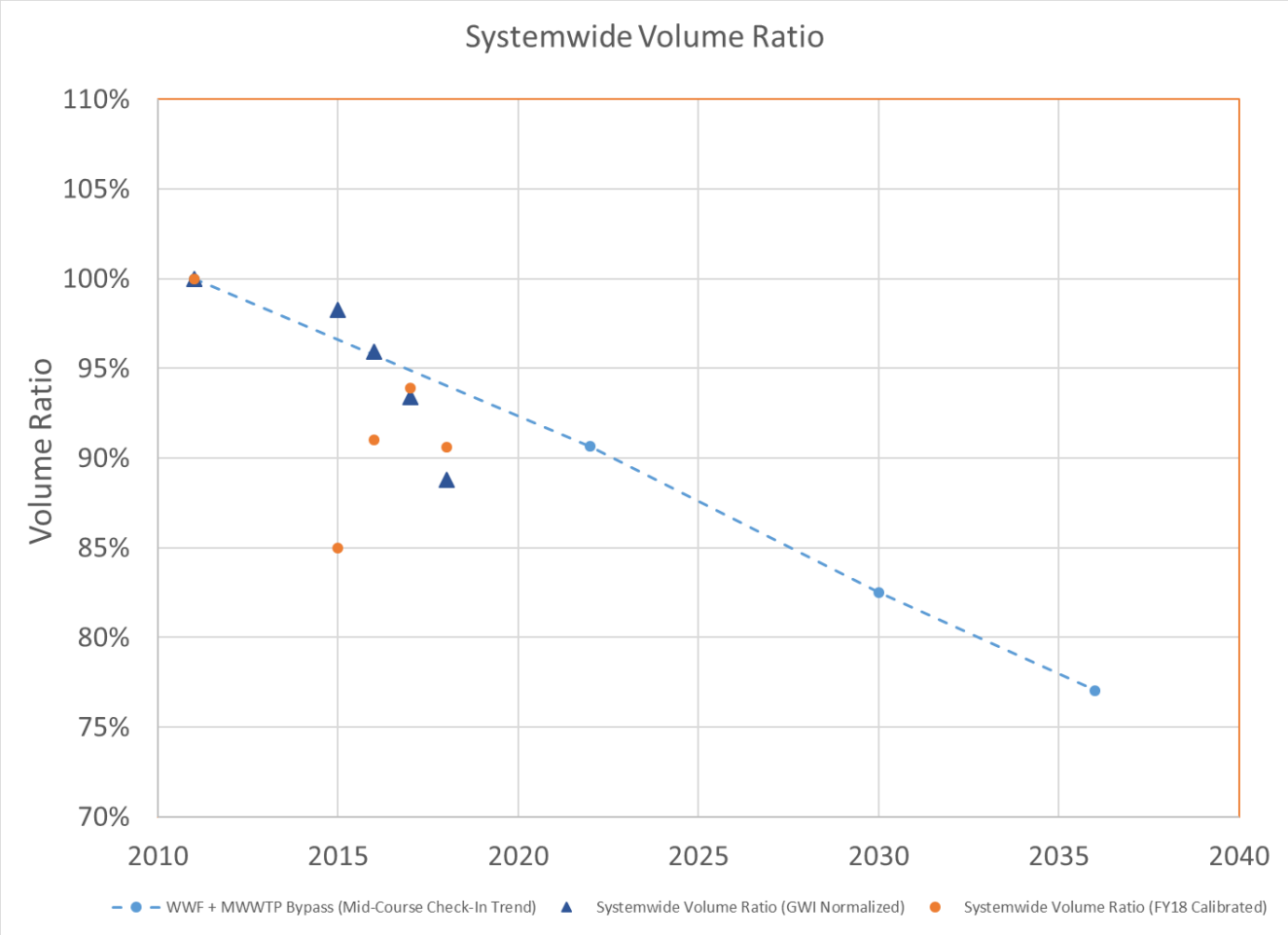
Flow Model Volume Ratio



FY18 Three-Year Average Volume Ratio – 92 %

SYSTEMWIDE VOLUME RATIO	
FY16	91%
FY17	94%
FY18	91%

Flow Model Volume Ratio



Systemwide Volume Ratio

- Calibrated vs. GWI Normalized
- Tracks volume reductions accounting for climatologic variances