MSAR WATERSHED TMDL TASK FORCE

Synoptic Study 2025-2026: Bacteria Source Tracking and Pathogens

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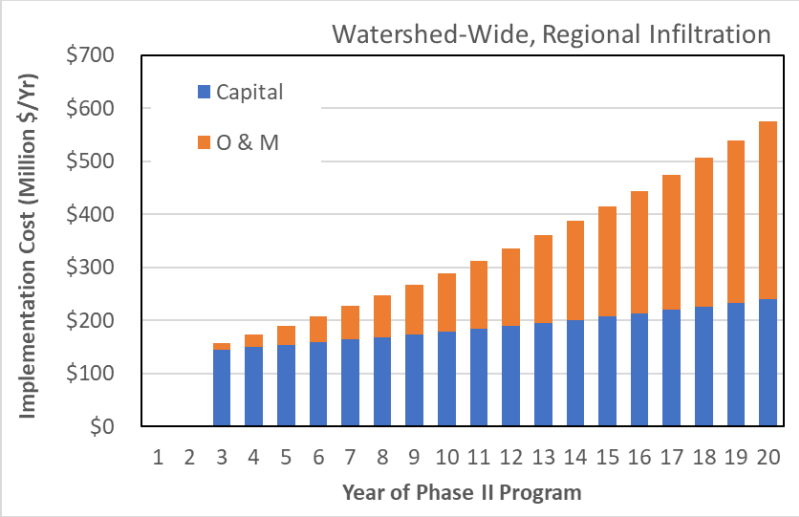
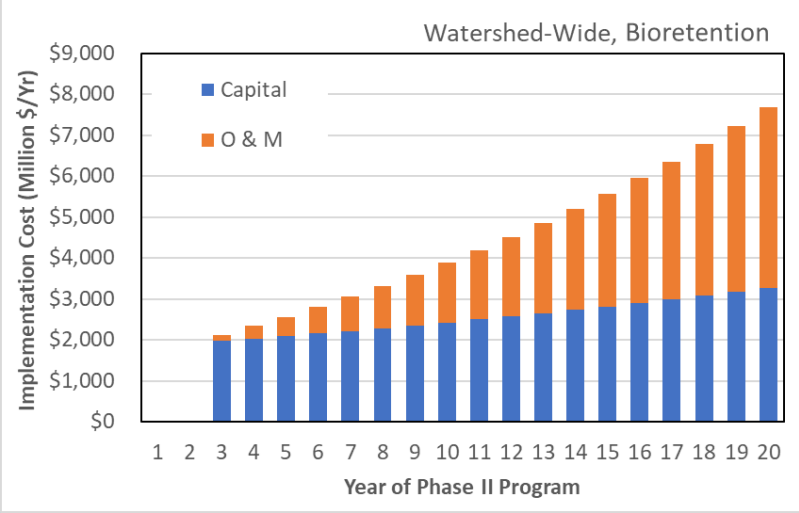
AGENDA

- TMDL Revision Technical Report
- Proposed 2025 Synoptic Study

TMDL REVISION UPDATE

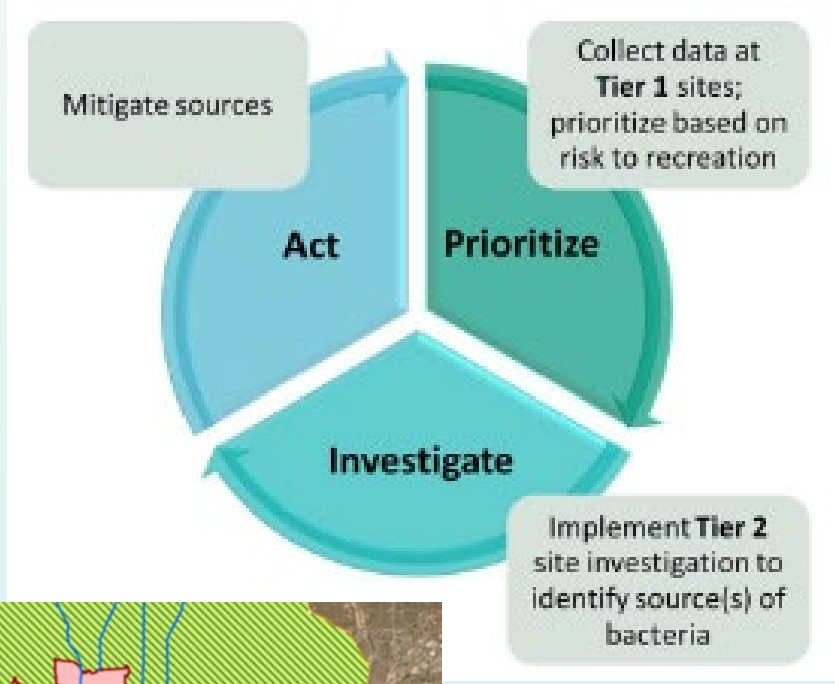
- Draft submitted for Task Force Review on November 19
- Comments still expected from Regional Board
- BPA documents to follow based on RB comments
- New charts from December Task Force meeting may be incorporated into the Appendix for 20-yr justification
- Still aiming for 2025 adoption!

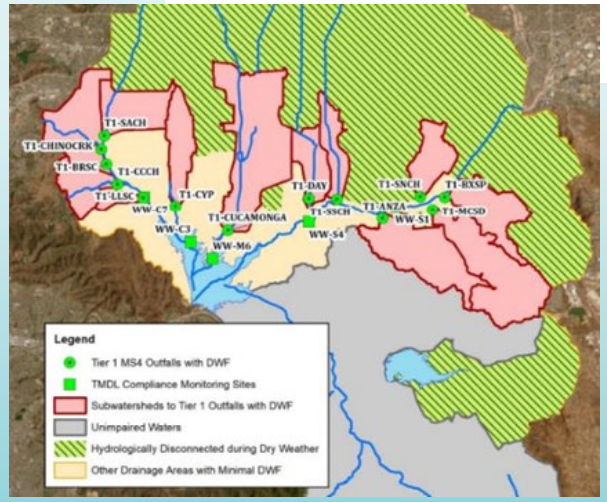




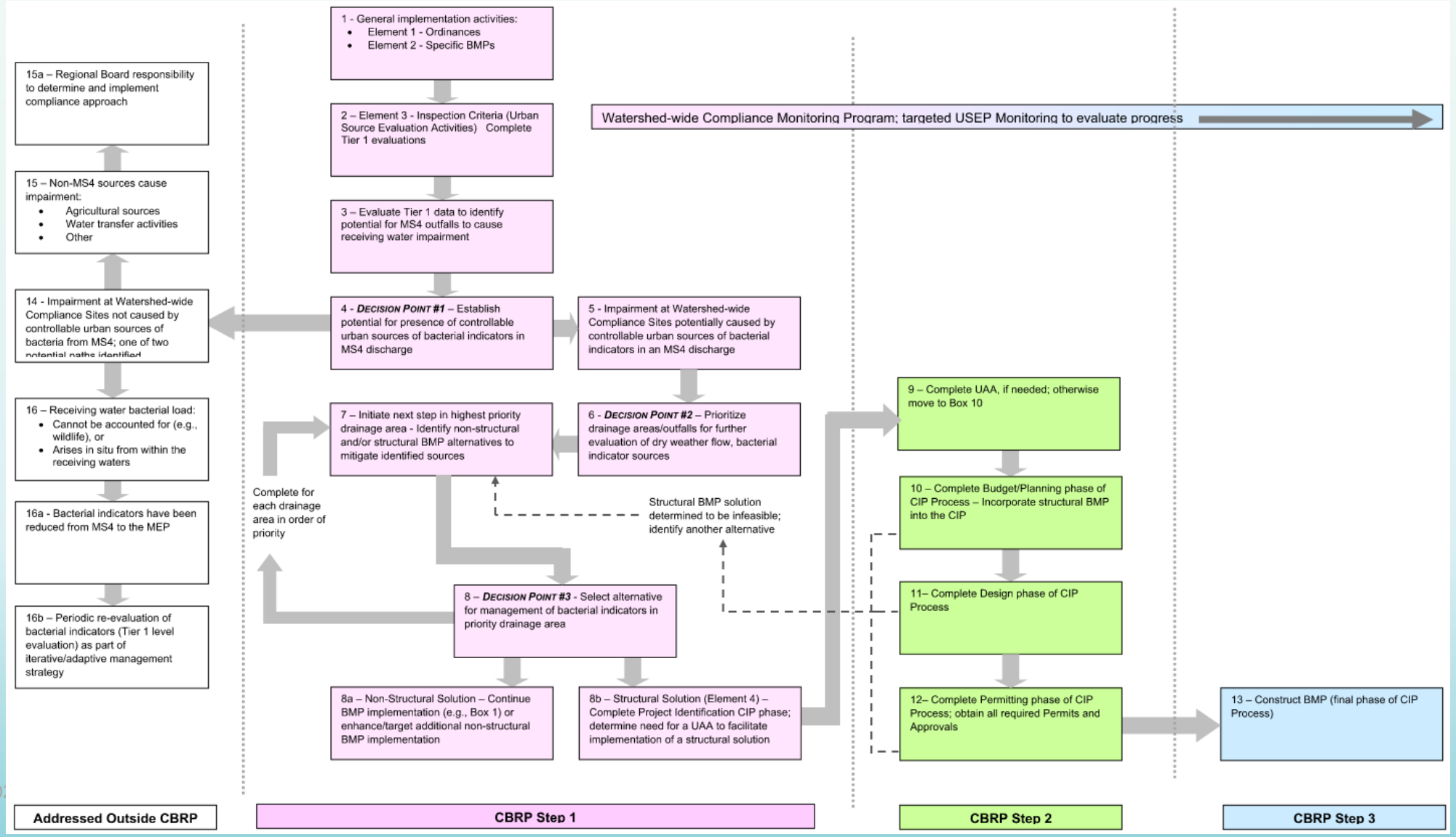
PROPOSED 2025 SYNOPTIC STUDY - OBJECTIVES

- Implement the dry weather CBRP through iterative adaptive management (aligns with Task 5)
- Identify sources of bacterial indicators in the MSAR watershed under wet weather conditions (aligns with Task 8)
- Collect data to consider AWQC based on 2024 EPA guidance (aligns with Task 12)



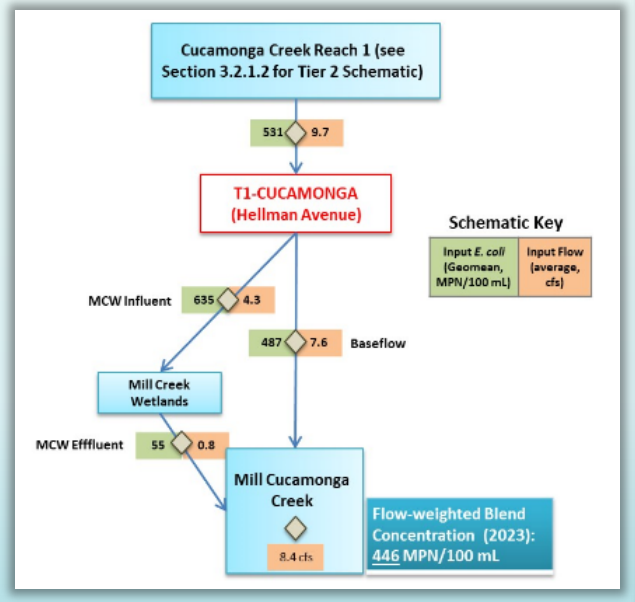


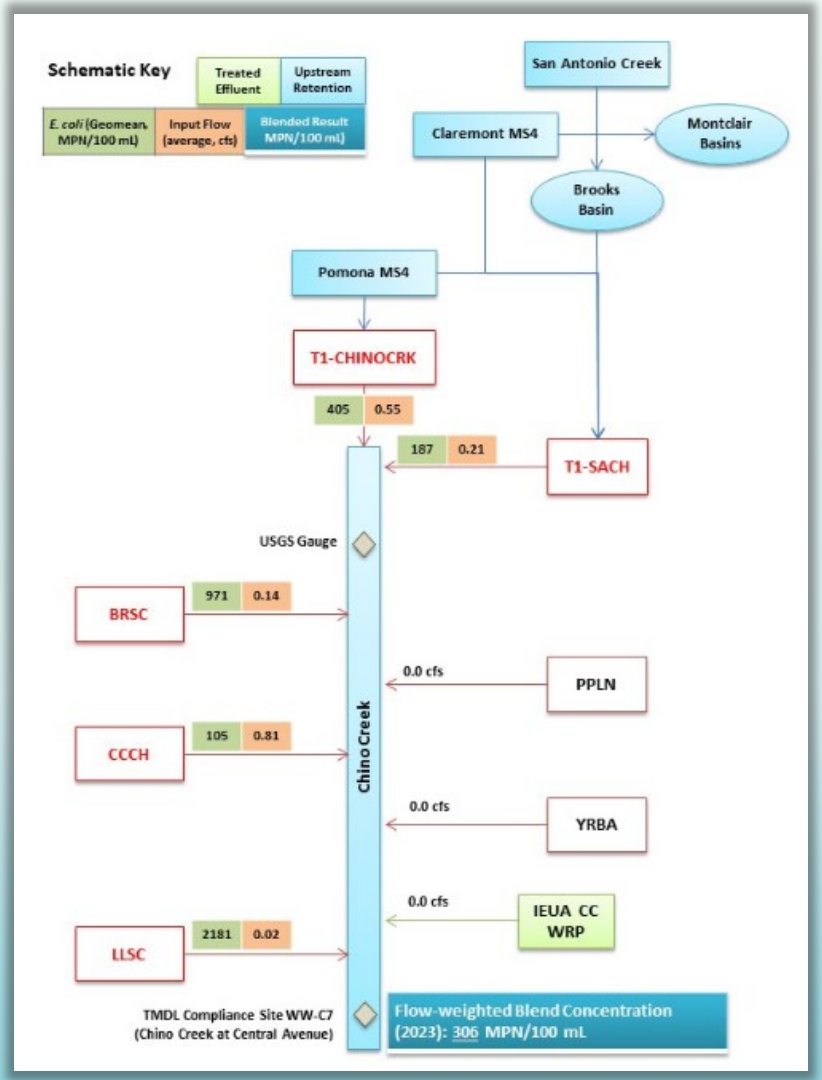
DRY WEATHER CBRP APPROACH

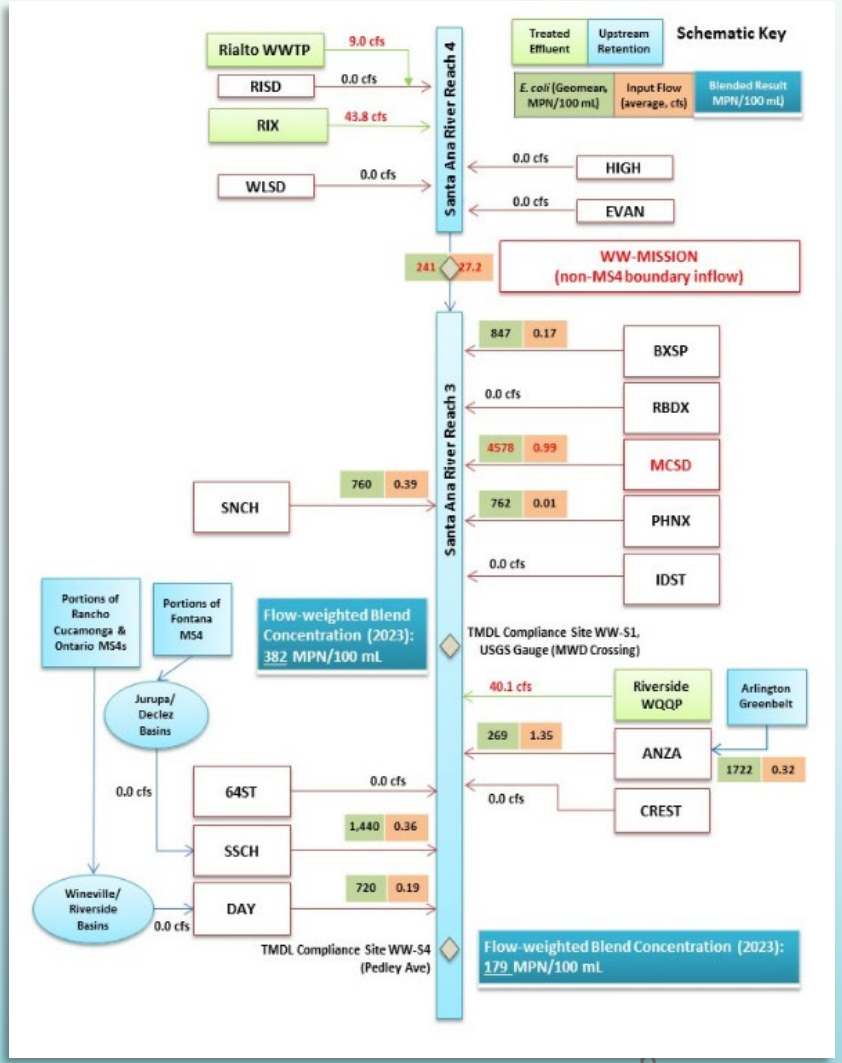


CBRP IMPLEMENTATION

- Source contribution analysis for all three flowing TMDL waters

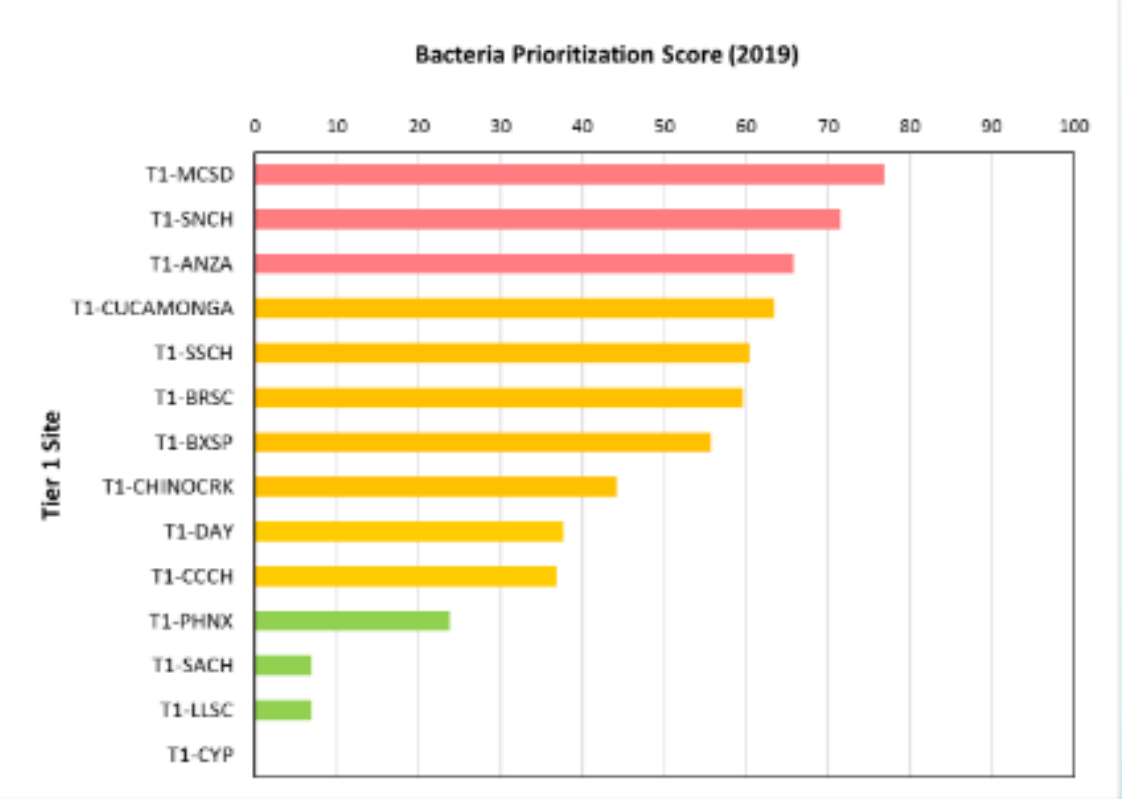






CBRP IMPLEMENTATION

- Prioritization of Tier 1 MS4 Subwatersheds
- Bacteria prioritization score
  - *Dry weather flow rate (30%)*
  - *E. coli load (30%)*
  - *MST marker detections (30%)*
  - *Risk of exposure (10%)*
- Update with new Tier 1 data in 2026 Triennial TMDL Report



2025 SYNOPTIC STUDY – PRELIMINARY DESIGN

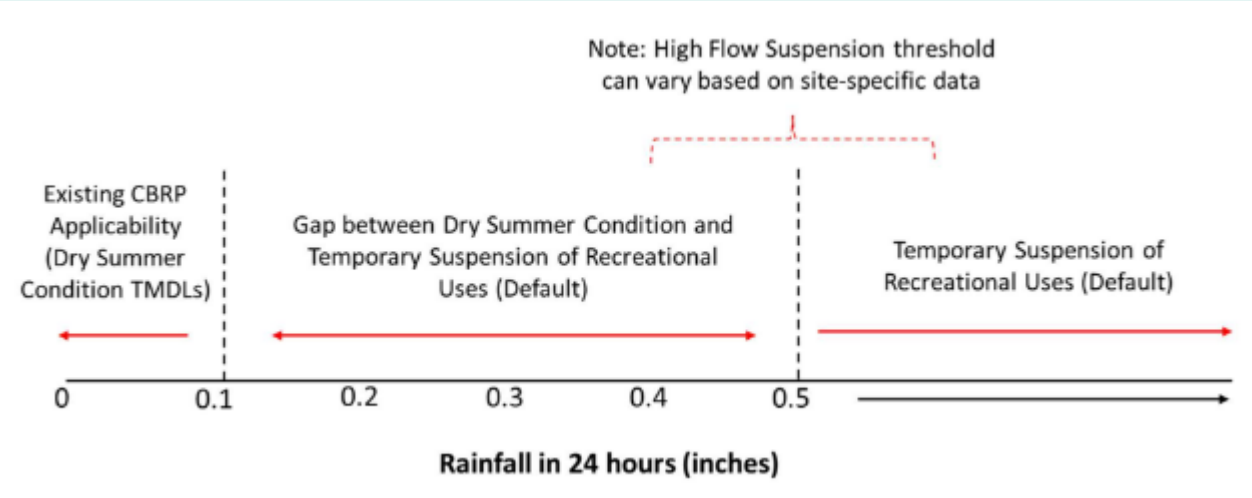
- Create study design plan in advance for Task Force review
- Update QAPP
- County MS4 program staff to collect Tier 1 and 2 samples
- RBMP field team to collect water for additional analytes

Condition	Sampling Events	TMDL Compliance and Other Mainstem Sites (n=6)	Tier 1 and 2 (n=18)
Dry	6	EC[1], MST, Pathogens[2]	EC, MST
Wet	1	EC[1], MST, Pathogens[2]	None

1) Most *E. coli measured through routine RBMP implementation*
2) Pathogen analysis dependent upon results of MST analysis

2025 SYNOPTIC STUDY – PRELIMINARY DESIGN

- Source tracking in Wet Weather
- Grab samples at TMDL compliance sites during 1 event in 2025/26



MSAR TMDL WATERS AS CANDIDATES FOR AWQC

- EPA (2024) alternative criteria in predominantly non-human impacted streams
- 41/42 HF183 non-detects in 2019 suggest MSAR is a candidate for AWQC
- Non-detect HF183 ~ non-detect Norovirus in same sample
- Data collection in 2025 to assess applicability according to EPA guidance

Example from Temple University

Pathogen	Mean AGI Swimmer Risk (Cases/1000)	
	Cobbs Creek with CSOs (n=20)	Wissahickon Creek without CSO (n=40)
Norovirus	39.0	0.8
E. coli 0157	1.3	0.1
Salmanella	0.1	0.0
Giardia	0.3	0.1
Adenovirus	0.1	0.0
Enterovirus	0.0	0.0
Cryptosporidium	0.7	0.4
Jejuni	0.0	0.0
Total AGI Risk	41.5	1.3
E. Coli (mpn/100mL)	7,700	380

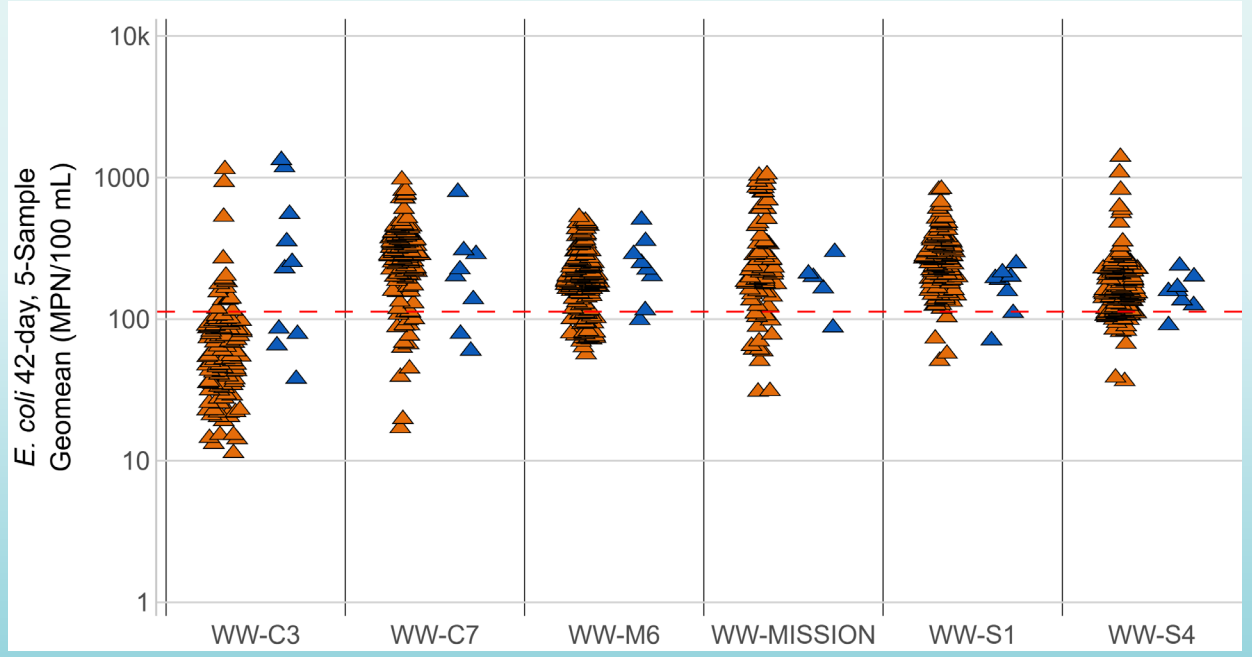
MSAR TMDL WATERS AS CANDIDATES FOR AWQC

- Example from EPA 2024 Guidance shows AWQC could be ~10 times above current REC1 objectives if human contribution is very low
- MSAR TMDL waters 5 samples geomeans (2026-2024) generally under 1,000 MPN/100mL

Table 4-2. Predicted median enterococci densities that correspond to illness levels of 36 NGI per 1,000 recreators (RBT) for waters impacted by mixed sea gull and human fecal contamination.

Nonhuman source	Percent human contribution				
	10%	20%	30%	50%	100%
Gull (Soller et al., 2014)	339	174	116	70	35
Gull (this TSM gull case study)	349	175	117	70	35

MSAR TMDL waters 5 samples geomeans (2026-2024)



2025 SYNOPTIC STUDY – METHOD FLOWCHART

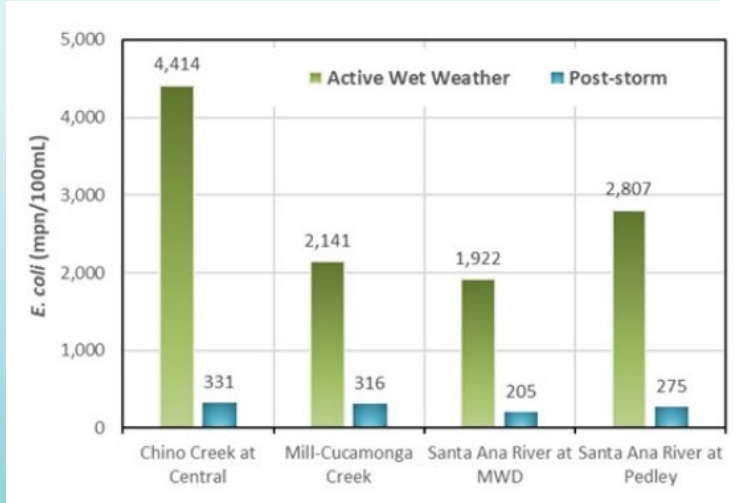
Scenario (For Decisions about Human Phage and Pathogen Assays)	Primary Assays			Additional Confirmation Marker		Pathogen Assays		
	HF183	**Canine**	**Interpretation**	**Human Phage**	**Interpretation**	**Human Virus**	**Other Bacteria Pathogens**	**Interpretation**
Scenario 1	+++	ND	Human (High Risk)					Presumed high risk
Scenario 2	ND	++	Canine				M	Consider additional QMRA
Scenario 3	++	+++	Human/Canine	ND	Canine dominant		M	Consider additional QMRA
Scenario 4	+++	++	Human/Canine	+++	Human (High Risk)			Presumed high risk
Scenario 5	BDL	BDL	Human/Canine	+	Human (Assess Risk)	M	M	Consider additional QMRA

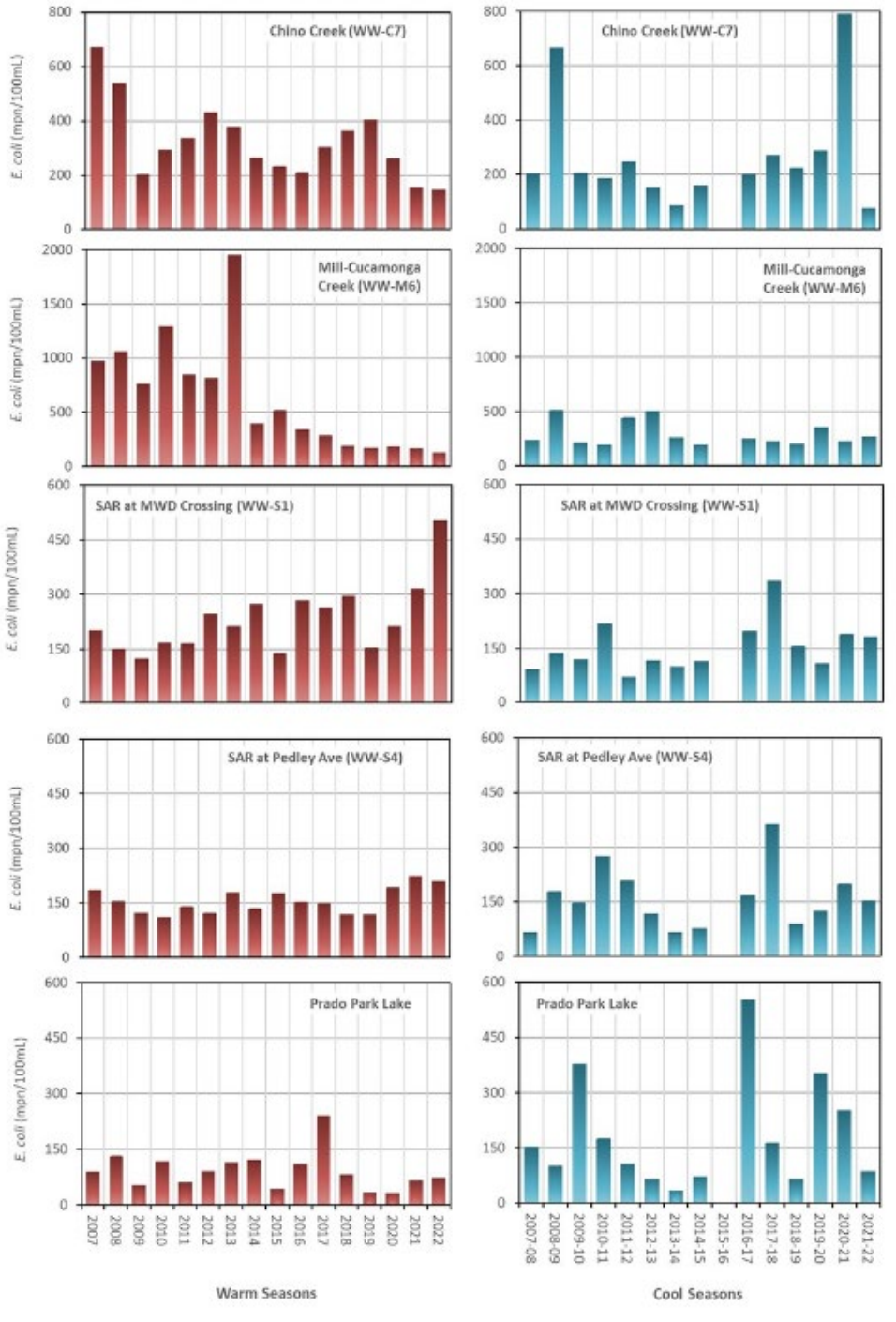
KEY

ND	Not Detected
++	Detected
BDL	Measured below Detection
M	Measure Pathogen Assays
Consider additional QMRA	Finding suggests low illness risk at current *E. coli* levels
Presumed high risk	Finding suggest AWQC not feasible

2026 TRIENNIAL TMDL REPORT

- Update TMDL compliance assessment based on most recent 3-year period
- Present results of 2025 Synoptic Study and future recommendations
- Characterize implementation actions including within collection system by other agencies





NEXT STEPS

- Stay on track for 2025 adoption of limited TMDL revisions
- Review proposal for 2025 Synoptic Study and 2026 Triennial TMDL Report