



2009-2025

**Potential Pathogens and Total Phosphorus
FULL REPORT**

Water Quality Monitoring (WQM) Program

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DATA PARAMETERS INCLUDED IN THIS REPORT

This report shows lab data parameters on 11 sites (8 of specific concern and 4 for the WI Department of Natural Resources' assessment) in Crawford County. Monthly baseline monitoring data is reported in the Surface Water Integrated System (dnrx.wisconsin.gov/swims/login.jsp) and can be seen on the Water Action Volunteers Program Stream Monitoring Data Dashboard (connect.doit.wisc.edu/wav-dashboard).

Lab testing is done by Leuther Lab, AgSource Labs, Helix Biolab, and the Wisconsin State Lab of Hygiene. Lab data is submitted to and validated by the Laboratory Coordinator of the WDNR at the end of each monitoring season.

Escherichia coli (E. coli):

- Pollution indicator of fecal pathogens (i.e. *Salmonella* and *Cryptosporidium*).
- Lives in warm blooded animal feces.
- Certain strains cause serious or even lethal digestive problems in humans.
- Human and hog feces carry over one million *E. coli* per gram.
- The safety standard for rivers is below 126 colony forming units (cfu)/100mL. 750 cfu/100ml requires a swimming advisory to be posted, and 1,000 cfu/100mL mandates closing of public beaches.
- *The highest E. coli result recorded by CSP was in 2019, at 170,000 cfu/100ml, over 1,300 times the standard.*

Total Phosphorus (TP):

- Pollution indicator nutrient.
- Low levels of TP (up to 0.075 mg/L) are naturally found in surface waters, but high amounts cause “eutrophication”:
Excess algae and plant growth ➔ Death and decomposition ➔ Oxygen levels drop dramatically
➔ Die-off of fish and other aquatic organisms.
- The most widespread water pollutant in Wisconsin due to soil erosion, manure lagoons and septic systems, detergents and runoff from farmland or lawns.
- *The highest TP result recorded by CSP was in 2019, at 4.22 mg/L, 56 times the standard.*

Background (heterotrophic) bacteria:

- Depend on other organisms or decomposed organic matter to survive.
- Some of the parasitic species can cause cholera and tetanus; *E. coli* also belongs to this group.
- *500,000,000 cfu/100 mL background bacteria was found in just one sample in 2020. Over 50,000/100mL is considered high background bacteria.*

Staphylococcus aureus (S. aureus):

- Water quality and MRSA (Methicillin Resistant *S. aureus*) indicator bacteria.
- MRSA is a very dangerous and infectious bacteria that may seriously affect skin, respiratory system, blood, create toxicity shock, and more. It has been linked to pig and dairy CAFO's.

Precipitation: can create large pulses of water that move quickly over and through the ground, carrying nutrients and pathogens from manure sources, agricultural fields, lawns, septic systems, etc., into surrounding water bodies and groundwater. Nutrient runoff contributes to the eutrophication of aquatic ecosystems.

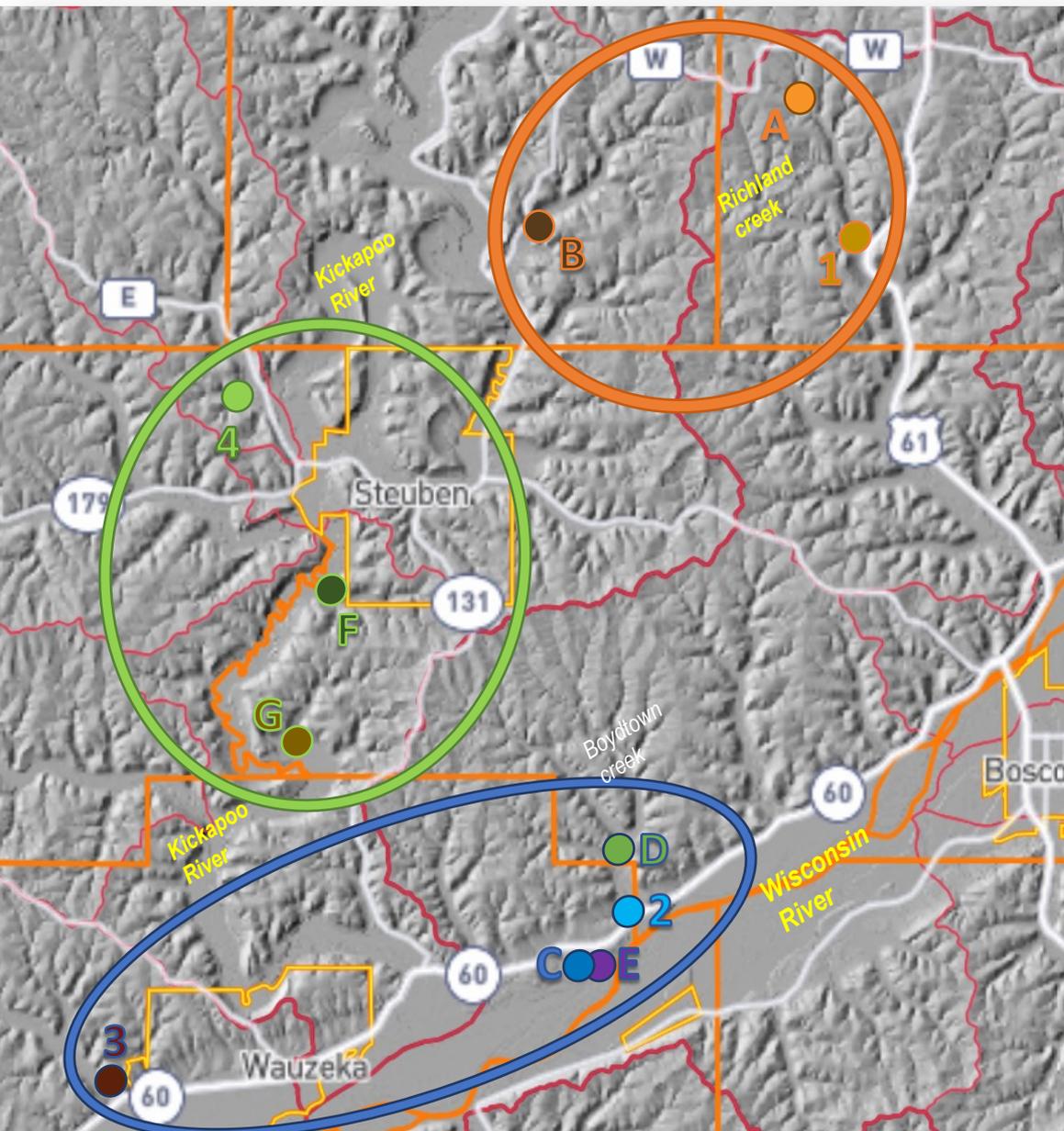
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ALL SITES LOCATION MAP

Crawford County



ZONE 1 (Scott & Haney Townships):

- A. Station #10044917 (Richland Creek at Byers Road), *impaired**
- B. Station #10056913 (Unnamed Trib 1183600 at Drake Rd.), was #10044132
- 1. Station #10044131 (Richland Creek – Childs Hollow Rd Bridge)

ZONE 2 (Wauzeka Township):

- C. Station #10032119 (WI River Tributary, 0.5 mi SE of STH 60 and Knob Ln Intersection), *impaired**
- D. Station #10032123 (Boydtown Creek 400 ft west of Hilldale Rd)
- E. Station #10052569 (Unnamed 5035112 at Spring), *impaired**
- 2. Station #10013610 (Boydtown Creek Station 1- From STH 60 Upstream)
- 3. Station #10029558 (Little Kickapoo Creek, Hwy 60 St 1)

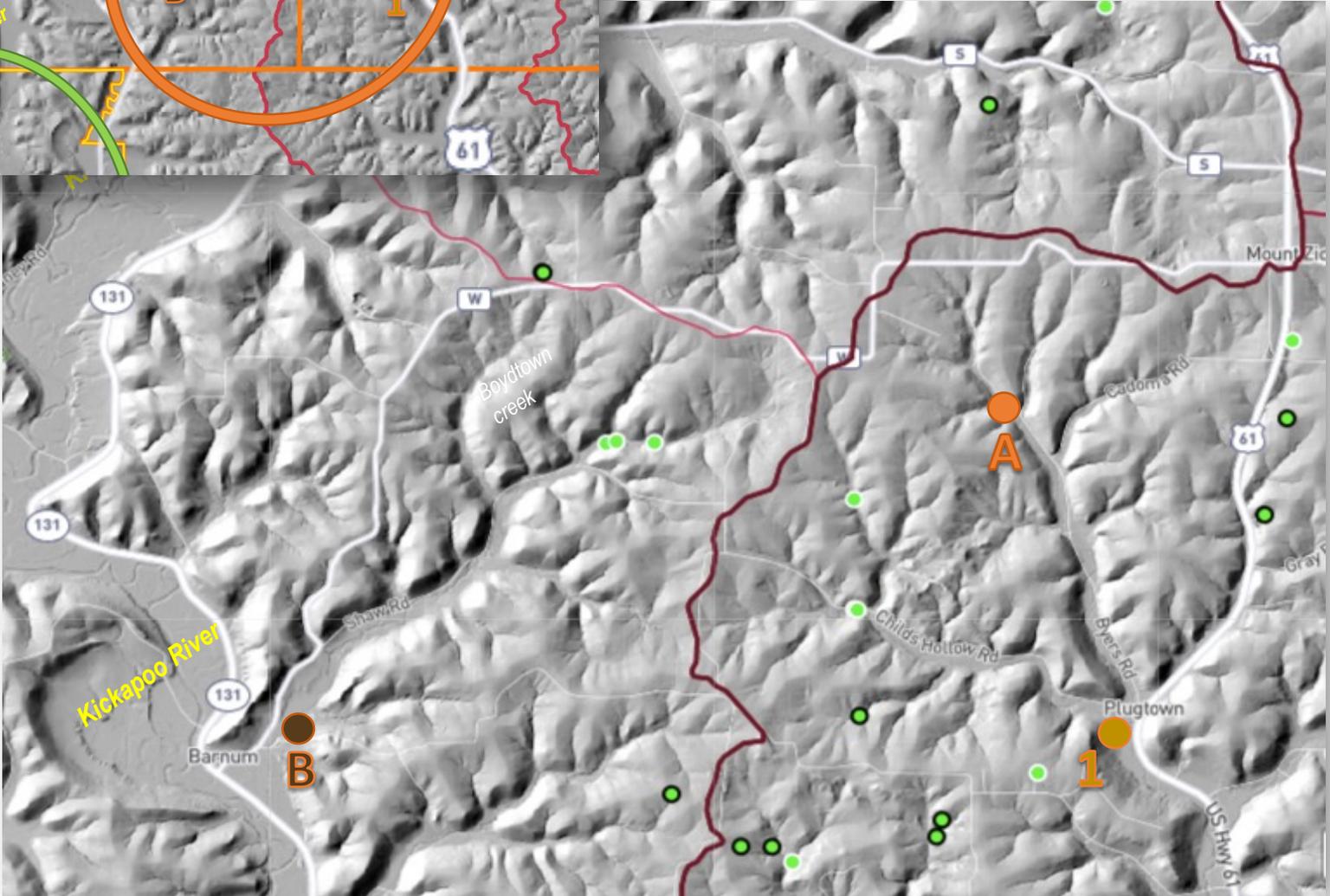
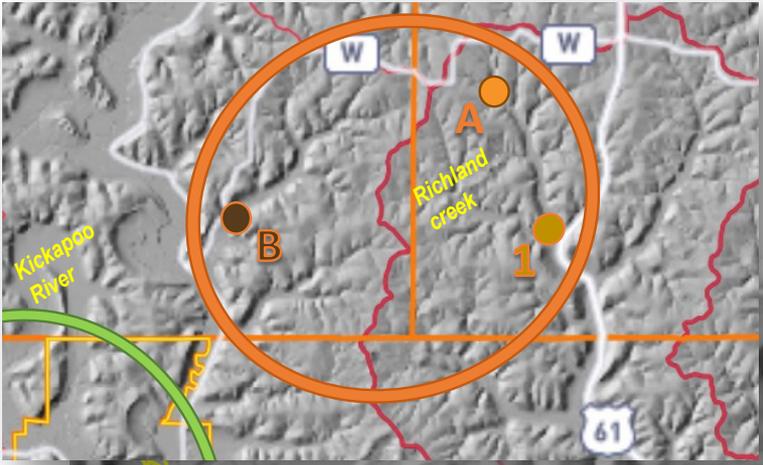
ZONE 3 (Marietta Township):

- F. Station #10052670 (Unnamed 5034616 at Kickapoo Valley Road)
- G. Station #10052671 (Unnamed 5034666 at Kickapoo Valley Road)
- 4. Station #10009025 (Citron Creek #1 Bridge on Cty E)

- Watershed boundary
- Sub-watershed boundary

***Impaired (for high Total Phosphorus):** Waters that do not meet WQS (Water Quality Standards) are placed on Wisconsin's Impaired Waters List -also known as the 303(d) list-, under Section 303(d) of the CWA (Federal Clean Water Act).

ZONE 1: Site location map



- Watershed boundary
- Sub-watershed boundary
- Possible sinkhole*
- Probable sinkhole*

* As identified by CSP's Karst Landscapes and Groundwater Susceptibility Survey of Crawford Co.

ZONE 1: E. coli & Total Phosphorus results, 2015 - 2025

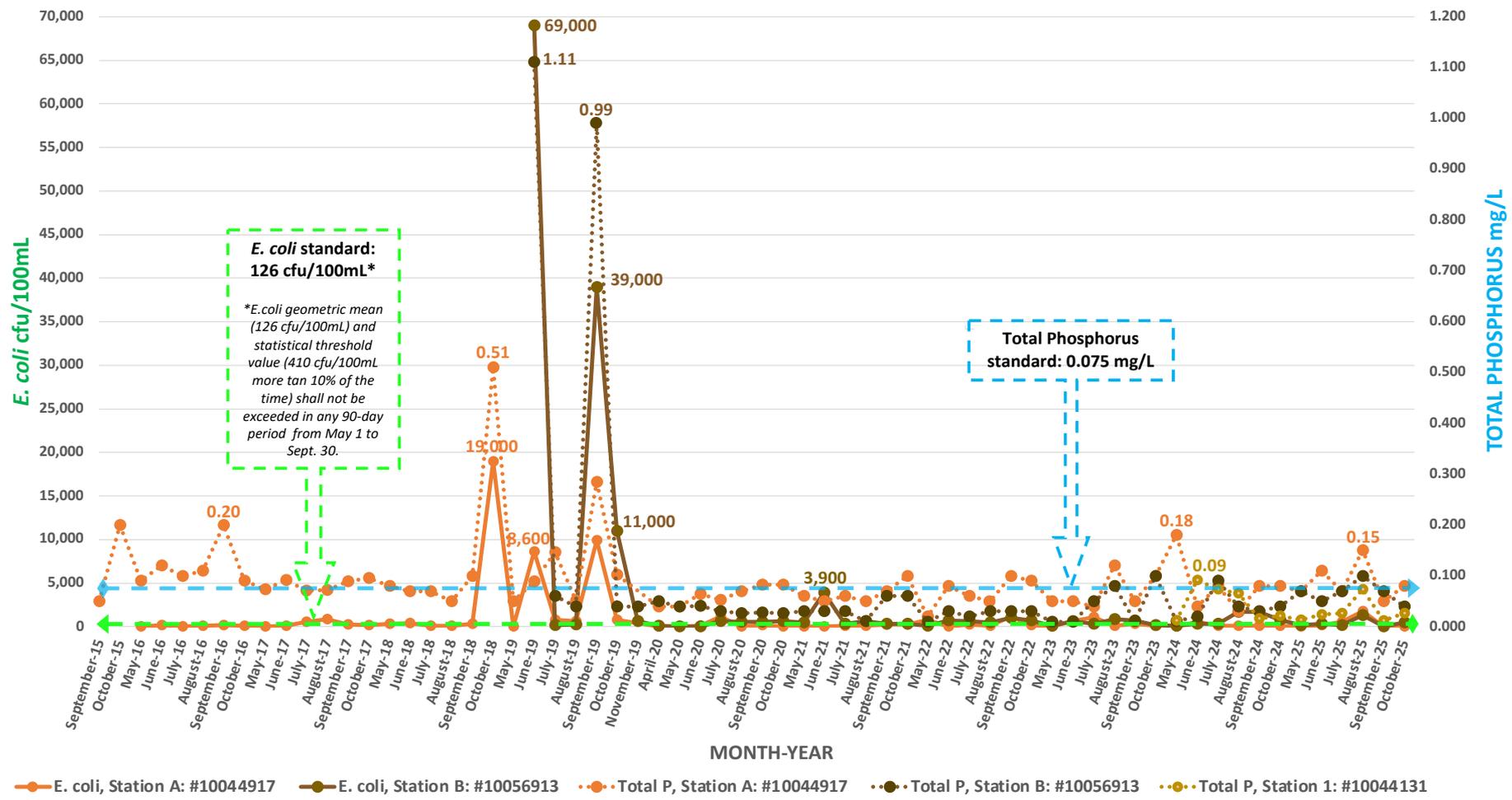


ZONE 1: E. coli AND TOTAL PHOSPHORUS RESULTS, 2015 - 2025

STATION A: #10044917 (Richland Creek at Byers Road)

STATION B: #10056913 (Unnamed Trib (1183600) at Drake Rd)

STATION 1 - DNR: #10044131 (Richland Creek – Childs Hollow Rd Bridge)



ZONE 1: Monitoring Months Average Precipitation & Total Annual Precipitation (inches), 2015 - 2025

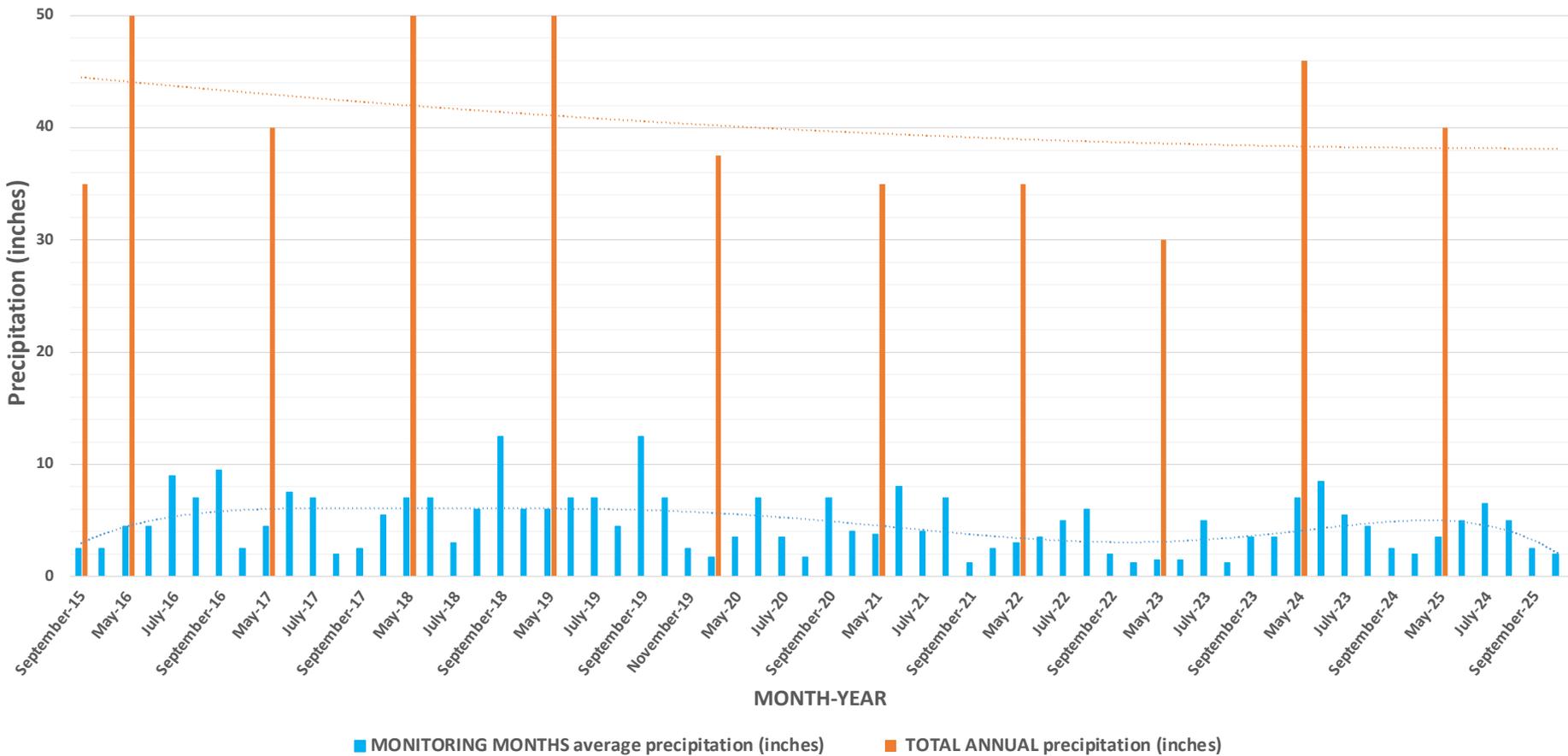


ZONE 1: MONITORING MONTHS AVERAGE PRECIPITATION and TOTAL ANNUAL PRECIPITATION, 2015 -2025

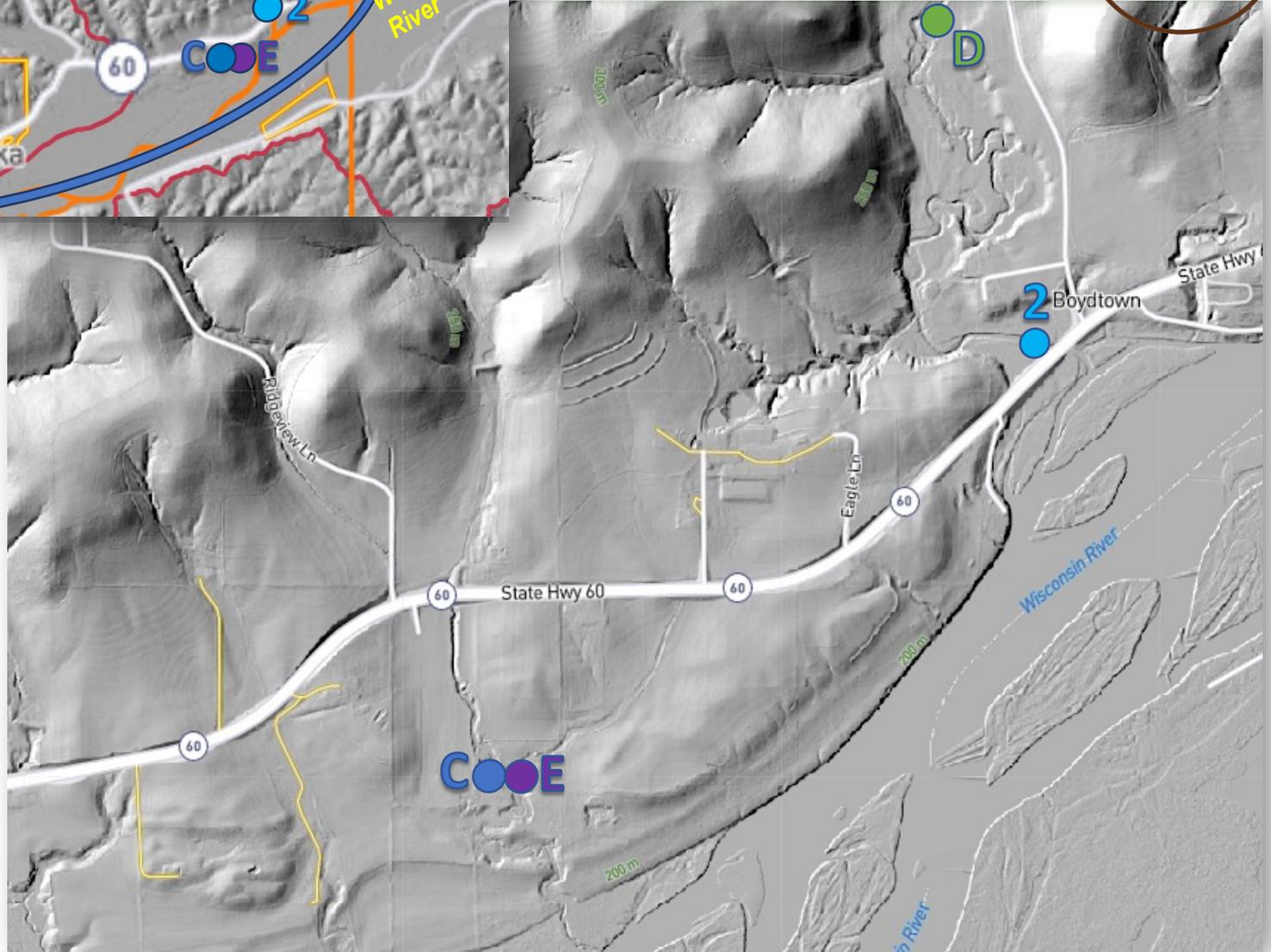
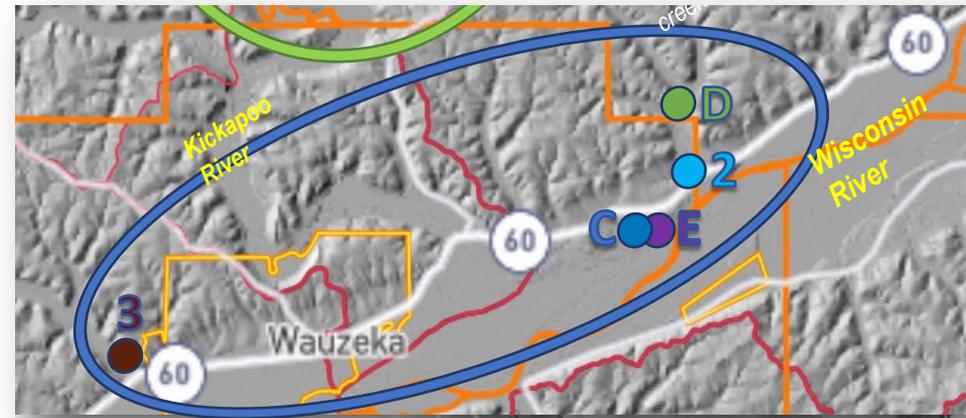
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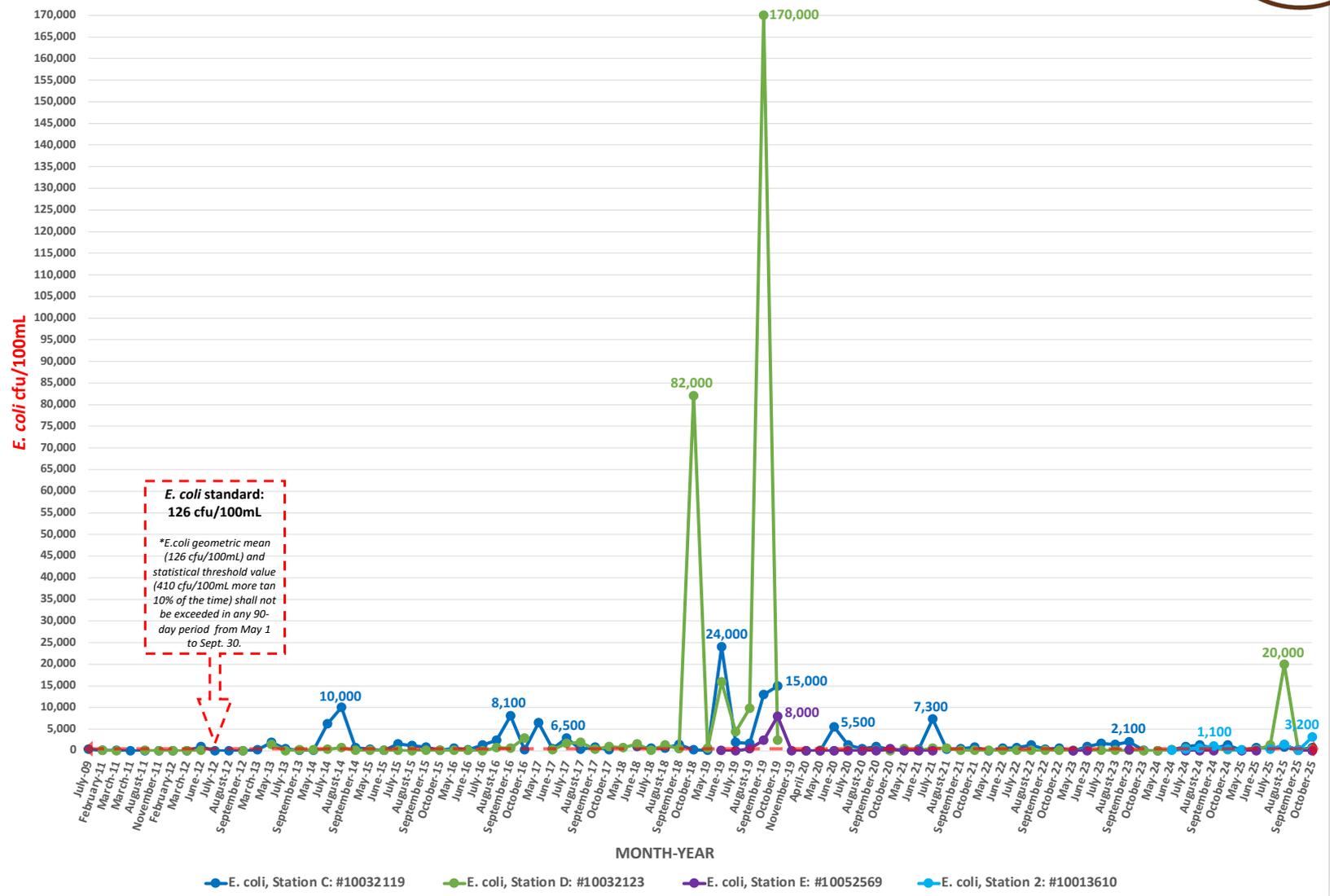
ZONE 2: Site location maps



ZONE 2: E. coli results (0 up to 170,000 cfu/100mL), 2009 - 2025



ZONE 2: E. coli RESULTS, 2009 - 2025
STATION C: #10032119 (WI River Tributary, 0.5 mi SE of STH 60 and Knob Ln Intersection)
STATION D: #10032123 (Boydton Creek 400 ft west of Hilldale Rd)
STATION E: #10052569 (Unnamed (5035112) at Spring)
STATION 2 - DNR: #10013610 (Boydton Creek Station 1-From STH 60 Upstream)



ZONE 2: *E. coli* results (0 up to 5,000 cfu/100mL), 2009 - 2025



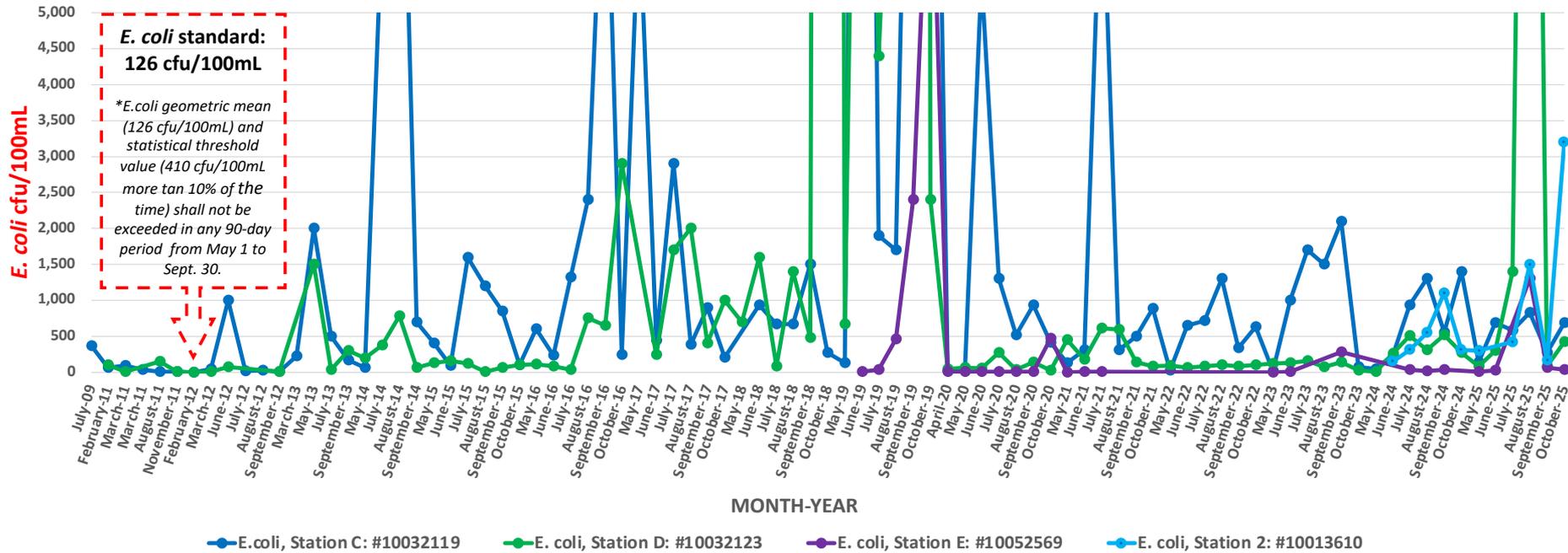
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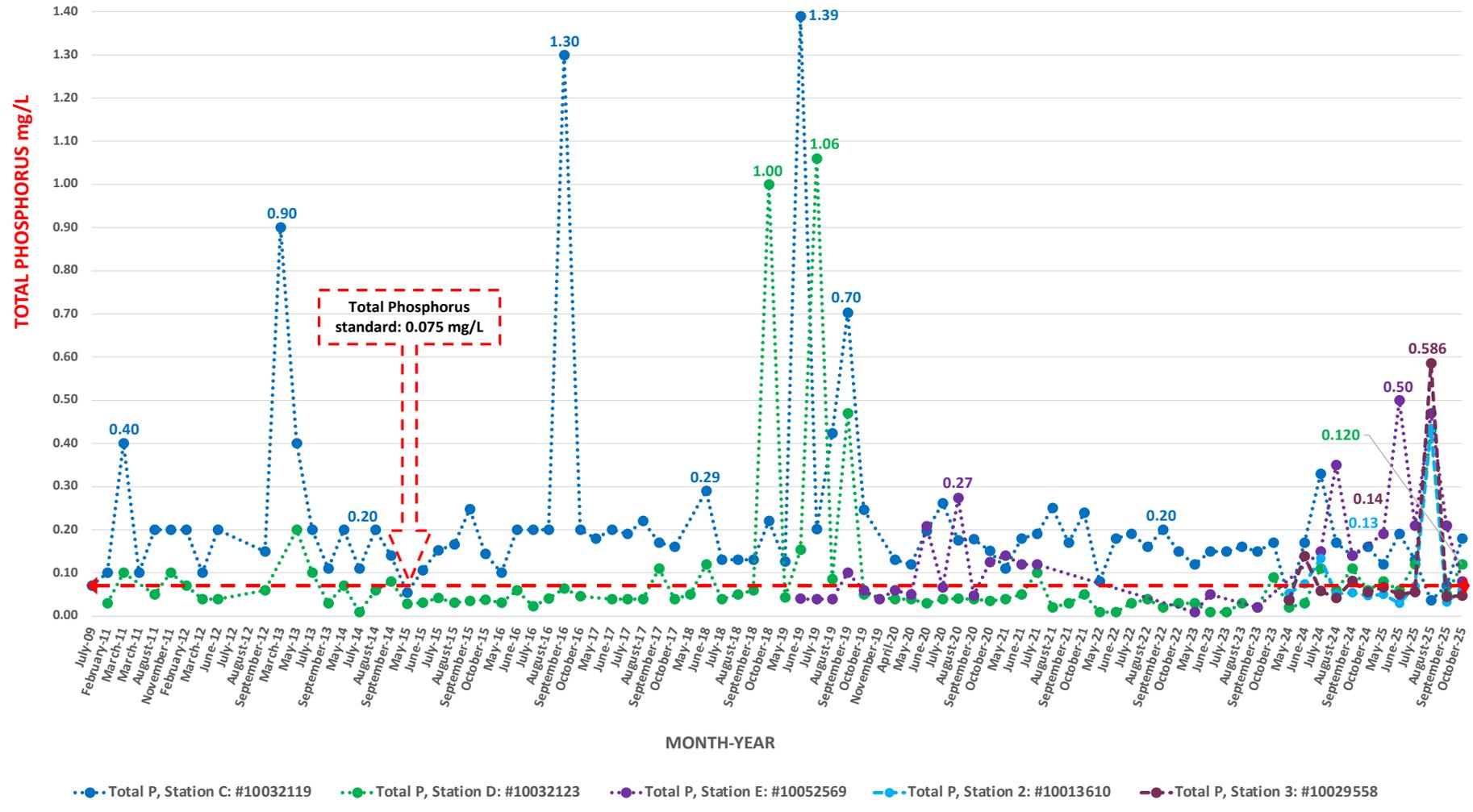
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ZONE 2: Total Phosphorus results, 2009 - 2025



ZONE 2: TOTAL PHOSPHORUS RESULTS, 2009 - 2025
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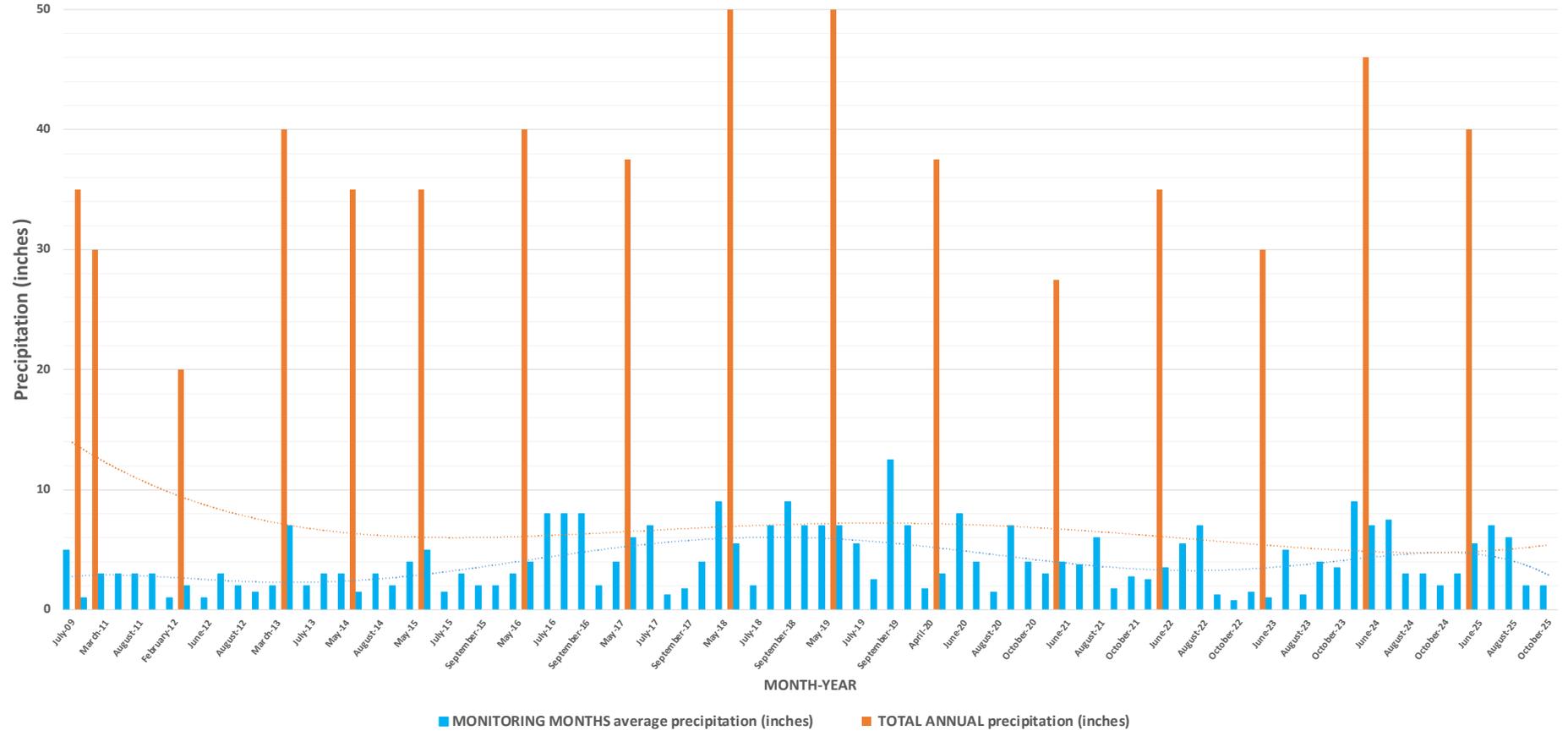


ZONE 2: Monitoring Months Average Precipitation & Total Annual Precipitation (inches), 2009 - 2025

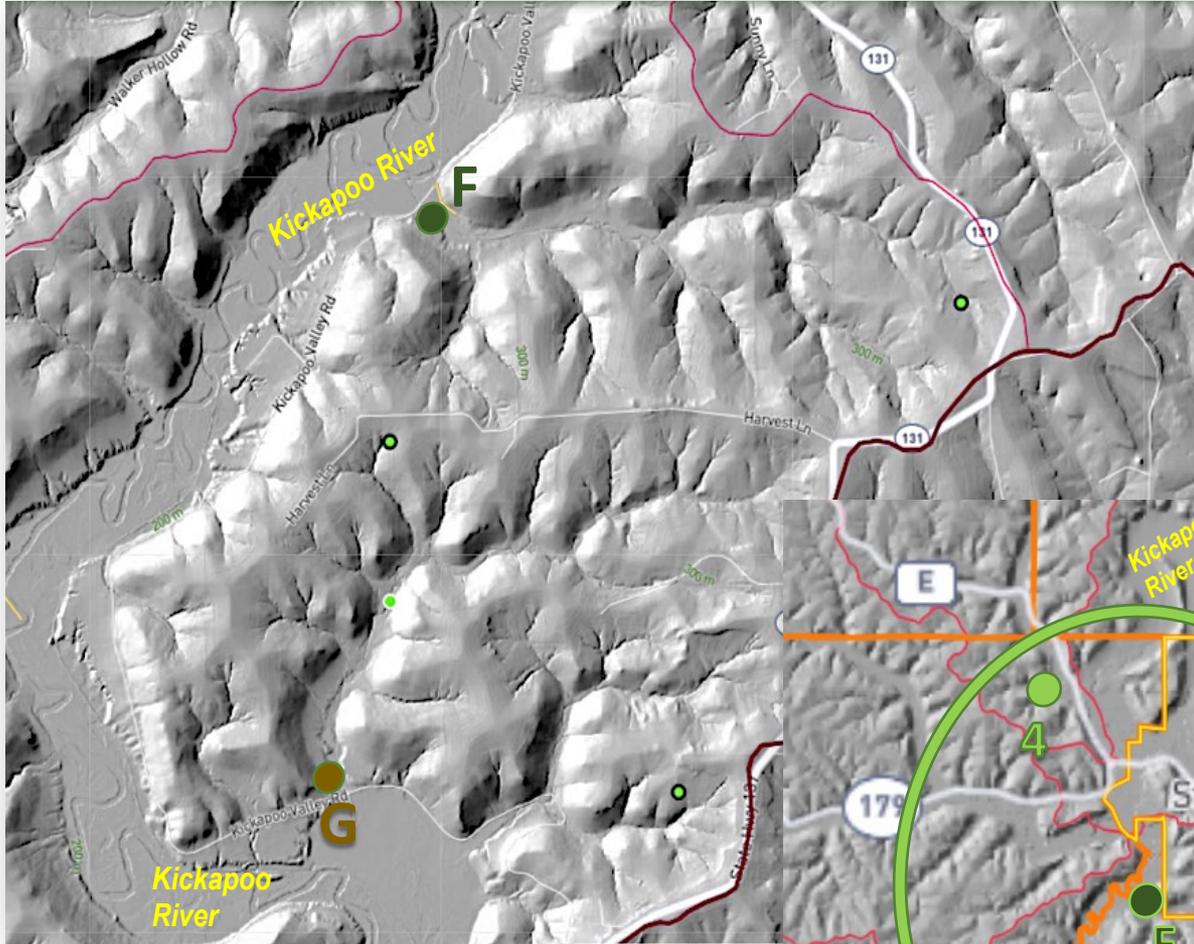


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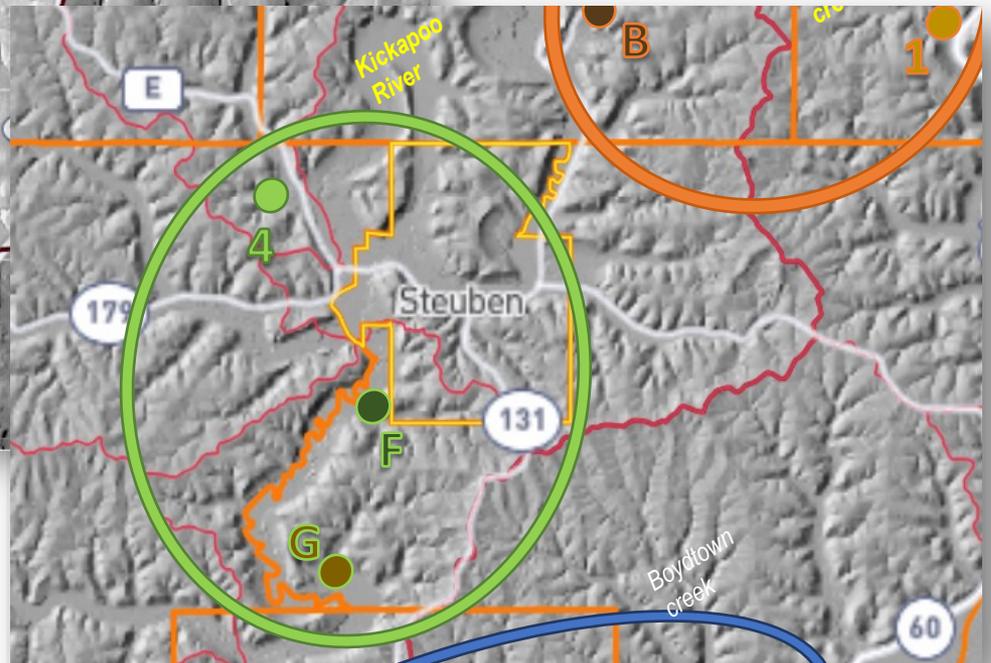


ZONE 3: Site location maps



- Watershed boundary
- Sub-watershed boundary
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* As identified by CSP's Karst Landscapes and Groundwater Susceptibility Survey of Crawford Co.



ZONE 3: E. coli and Total Phosphorus results, 2019 - 2025

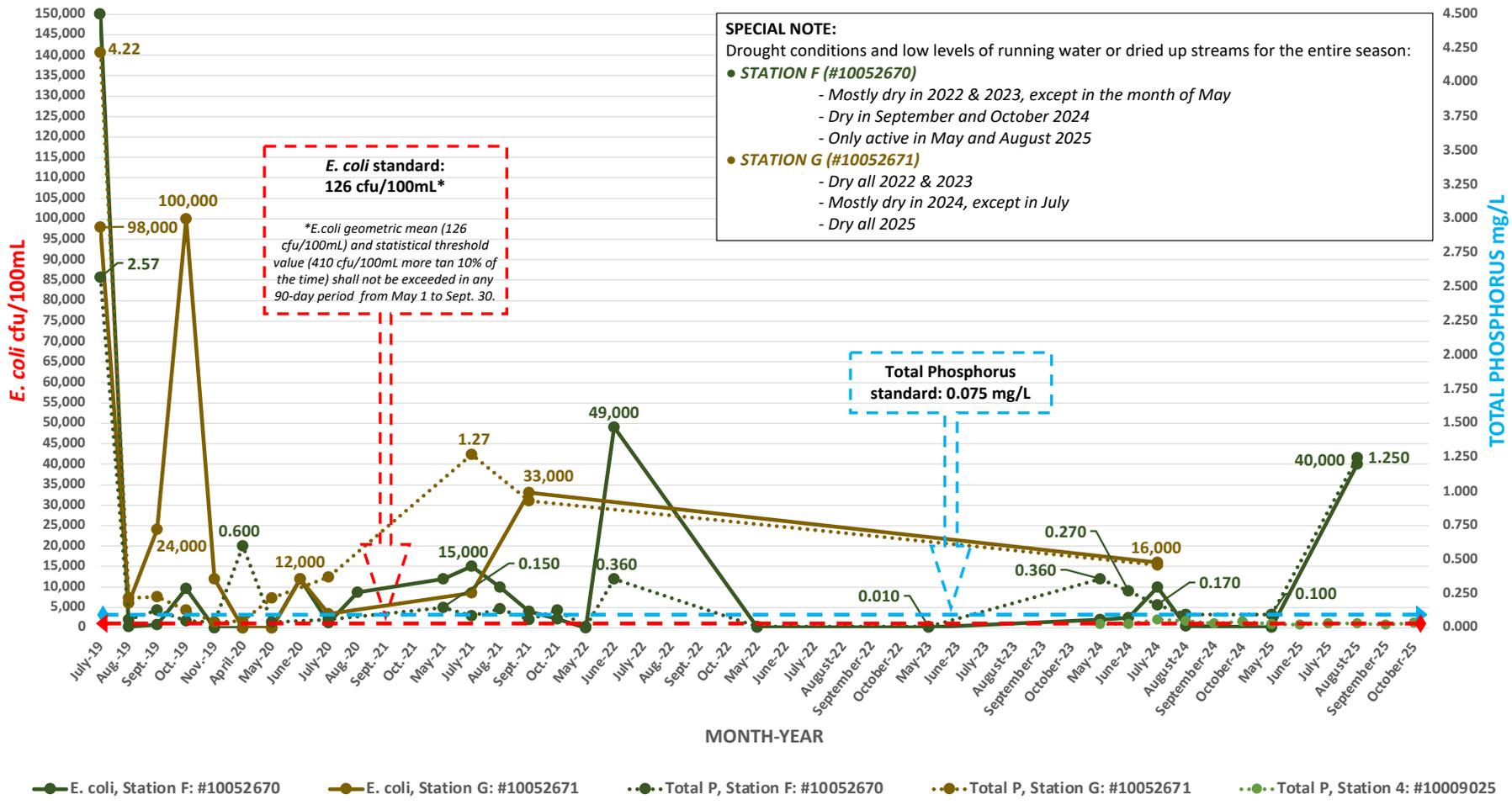


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STATION 4 - DNR: #10009025 (Citron Creek #1 Bridge on Cty E)

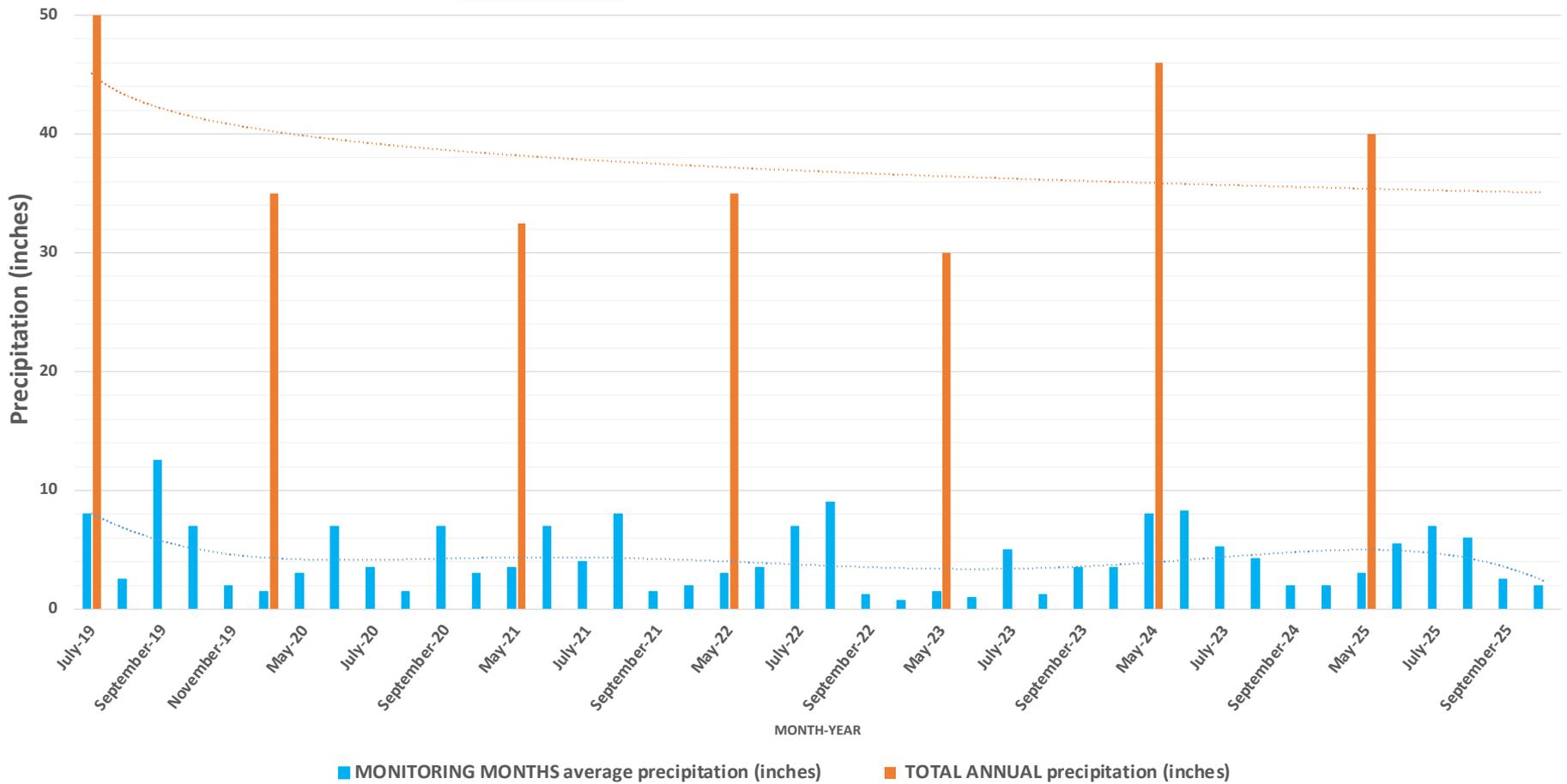


ZONE 3: Monitoring Months Average Precipitation & Total Annual Precipitation (inches), 2019 - 2025



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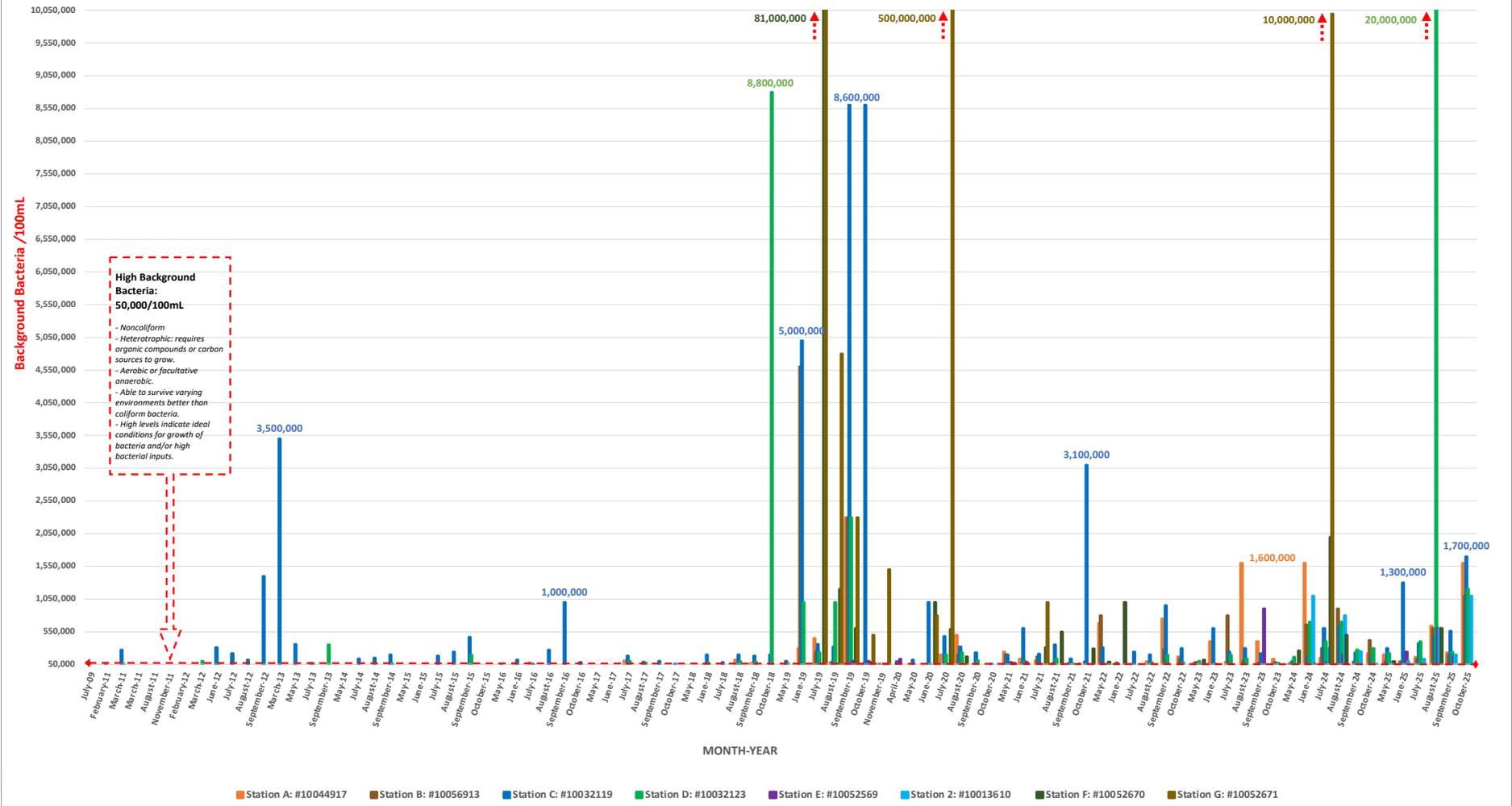


ZONES 1-3: Background Bacteria results (>50,000/100mL), 2009 - 2025



BACKGROUND BACTERIA RESULTS (>50,000), 2009-2025

ZONE 1: Station A: #10044917 (Richland Creek); Station B: #10056913 (Unnamed Trib (1183600) at Drake Rd)
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ZONES 1&2: *Staphylococcus Aureus* (& MRSA when present and/or tested for), 2009 - 2025

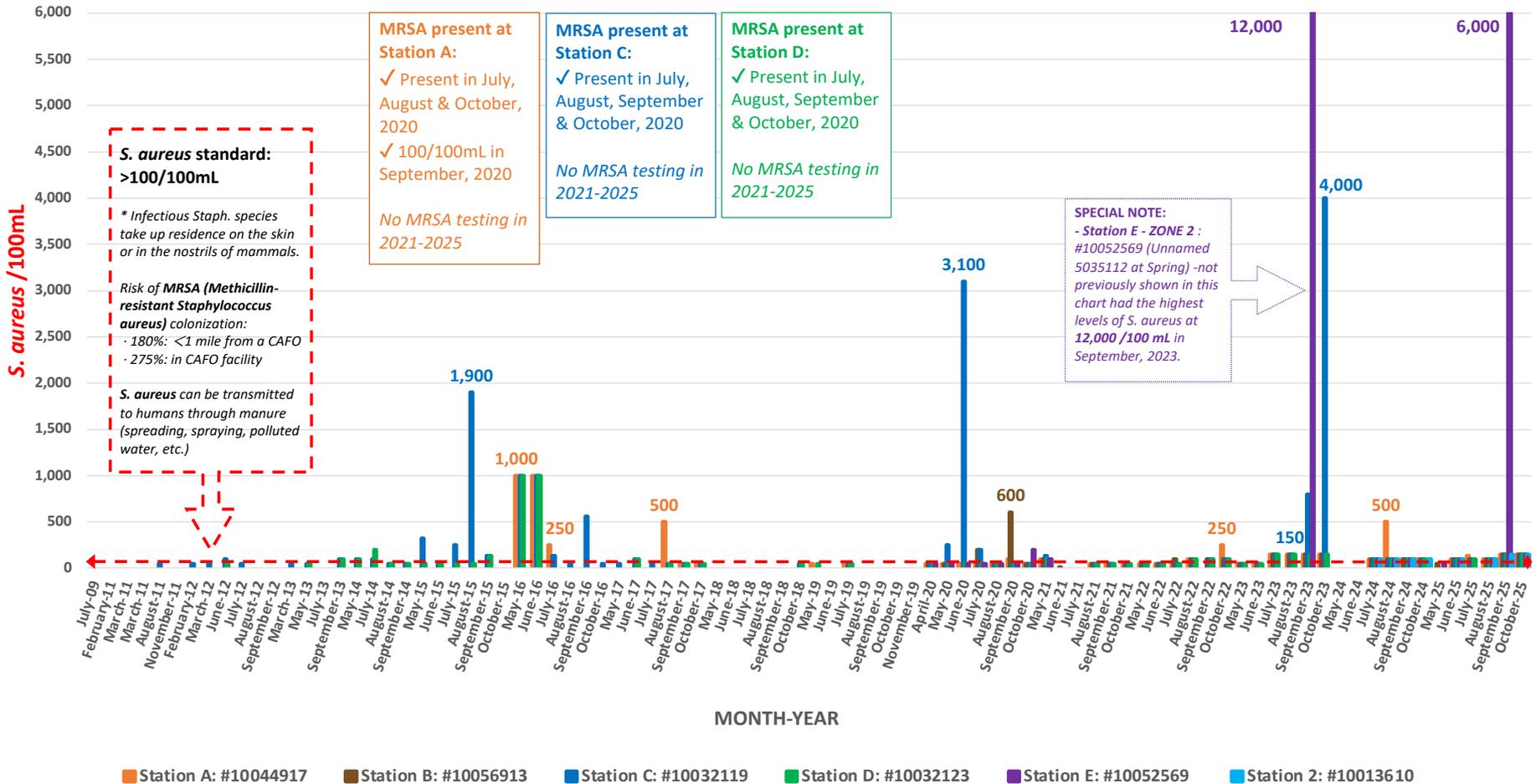


Staphylococcus aureus RESULTS (and MRSA when present and/or tested for), 2009-2025

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SOME REFERENCES



- [CSP Surface Water Monitoring Program:](https://www.crawfordstewardship.org/surfacewater/)
<https://www.crawfordstewardship.org/surfacewater/>
- [The Phosphorus Rule:](https://dnr.wisconsin.gov/sites/default/files/topic/Wastewater/TP_factsheet4162013.pdf)
https://dnr.wisconsin.gov/sites/default/files/topic/Wastewater/TP_factsheet4162013.pdf
- [Water Condition Lists:](https://dnr.wisconsin.gov/topic/SurfaceWater/ConditionLists.html)
<https://dnr.wisconsin.gov/topic/SurfaceWater/ConditionLists.html>
- [Water Condition Viewer:](https://dnrmaps.wi.gov/H5/?viewer=Water_Condition_Viewer)
https://dnrmaps.wi.gov/H5/?viewer=Water_Condition_Viewer
- [Impaired Water Search:](https://apps.dnr.wi.gov/water/impairedSearch.aspx)
<https://apps.dnr.wi.gov/water/impairedSearch.aspx>
- [CSP Regional Karst Geology Viewer:](https://karstology.crawfordstewardship.org/#/0/43.2217/center/-90.9201,43.2222)
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WATER QUALITY MONITORING (WQM) PROGRAM TIMELINE 2008 - 2018

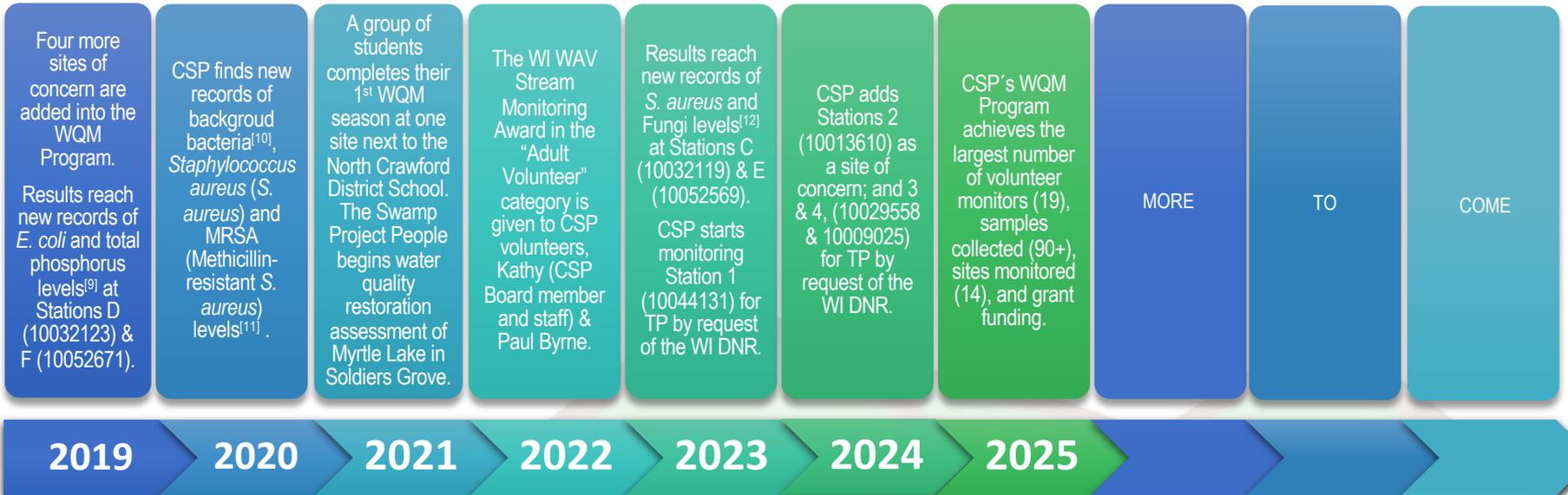
<p>CSP and VSN^[1], through WAV Program^[2], start monitoring health impacts, air emissions and water quality near proposed CAFO's^[3] in Crawford Co. and Vernon Co.</p>	<p>CSP expands monitoring of water quality near feeder pig CAFO near Wauzeka, Crawford Co.</p>	<p>CSP sponsors a meeting in Wauzeka with SRWN^[4], WI Sierra Club, DNR, VSN, WAV program, and local water monitors to begin formulating a statewide water quality and CAFO monitoring program.</p>	<p>CSP starts monitoring creeks near frac-sand mine sites in the area for chemicals, breaches, and turbidity of the water.</p>	<p>CSP gets funded and awarded by the WCBM Partnership Program^[5] for monitoring sand mine operations along the WI River near Bridgeport and Boscobel sand mines.</p>	<p>CSP encounters the highest total phosphorus^[6] levels so far; noticeable algae overgrowth; and antibiotic-resistant bacteria^[7] in Wauzeka streams.</p>	<p>CSP expands the Water Quality Monitoring Program to include a watershed of an expanding large dairy farm in Town of Haney, Crawford Co.</p>	<p>Volunteers Ellen Brooks and Dave Hackett win the WI WAV Stream Monitoring Award for Adult Volunteers category.</p>	<p>CSP supports Richland Stewardship Project in their WQM around an expanding dairy CAFO along the WI River. CSP and VSN start working together in WQM trainings.</p>	<p>Volunteers Deb & Bill Hiller win the WI WAV Stream Monitoring Award. CSP records very high <i>E. coli</i> levels^[8], and antibiotic-resistant bacteria at Stations D (10032123) & A (10044917).</p>
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[1] Crawford Stewardship Project (CSP); Valley Stewardship Network (VSN)
 [2] Water Action Volunteers (WAV), coordinated through a partnership between the University of Wisconsin Cooperative Extension and the WI Department of Natural Resources (DNR)
 [3] Concentrated animal feeding operation (CAFO)
 [4] Sustain Rural Wisconsin Network (SRWN)
 [5] Wisconsin Citizen Based Monitoring Partnership Program (WCBM)
 [6] Total Phosphorus (TP) = 1.3 mg/L and *E. coli* = 10,000 cfu/100 mL (Station #10032119); **Total Phosphorus standard: 0.075 mg/L**
 [7] Chloramphenicol: an antibiotic banned or restricted in U.S. meat. Can cause plasmatic anemia in humans.
 [8] *E. coli* = 82,000 cfu/100 mL (Station #10032123) and 19,000 cfu/100 mL (Station #10044917); ***E. coli* standard: 126 cfu/mL**



WATER QUALITY MONITORING (WQM) PROGRAM TIMELINE 2019 - 2025



^[9] *E. coli* = 170,000 = cfu/100 mL (Station #10032123); and Total Phosphorus (TP) = 4.22 mg/L (Station # 10052671)
^[10] Background Bacteria = 500,000,000/100 mL (Station # 10052671); **High Background Bacteria: 50,000/100mL**
^[11] *S. aureus* = 3,100/100 mL (Station #10032119); and MRSA = 100/100 mL (Station #10044917); ***S. aureus* and MRSA standard: <100/100mL**
^[12] *S. aureus* = 800/100 mL, and Fungi = >20,000/100 mL (Station #10032119); *S. aureus* = 12,000/100 mL, and Fungi = 36,000/100 mL (Station #10052569)