

# Air Force Installation & Mission Support Center

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## Wurtsmith Technical Session



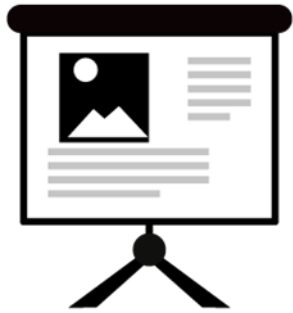
**Steven Willis**  
**AFCEC/CIBC**  
**20 Feb 2024**

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# Presentation:



FT002 at Clark's Marsh IRA Update

Justin Gal, WSP

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# Agenda



- FT002 Pump and Treat System
  - History
  - Overview
  - Performance
    - Concentration Trends
    - Hydraulic Evaluation

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# Wurtsmith Base Wide Map



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# ***FT002 Pump and Treat System– Treatment System Overview***

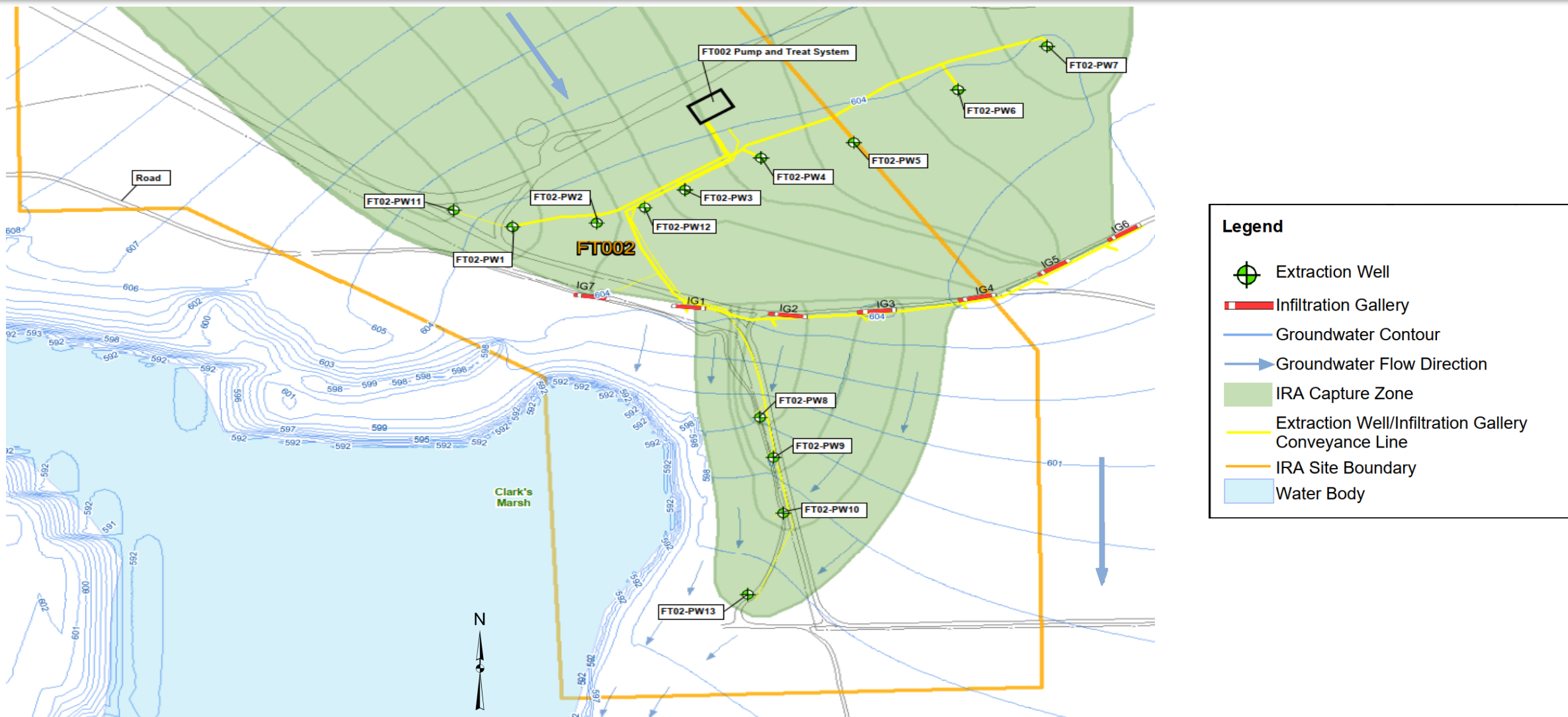


- Time Critical Removal Action (TCRA)- Initial configuration began operating in April 2015.
  - FT002 Pump and Treat System (PTS) was installed as a TCRA to intercept and treat core of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) plume emanating from FT002 and adjacent OT016.
  - Targeted PFOS >200 nanograms per liter (ng/L) and PFOA >400 ng/L (EPA Provisional Health Advisories at the time).
- Interim Remedial Action (IRA) expansion began operating in August 2022.
  - The FT002 at Clark's Marsh IRA was installed to increase the amount of contaminated groundwater captured and treated.





# FT002 Pump and Treat System– IRP Site FT002 Site Map



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# FT002 Pump and Treat System– System Performance



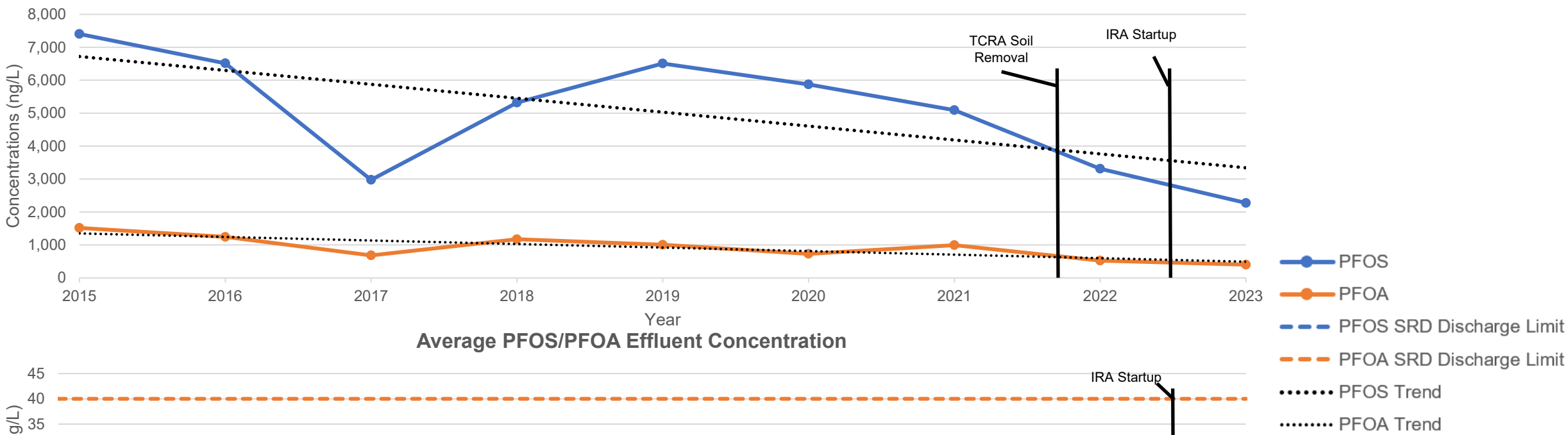
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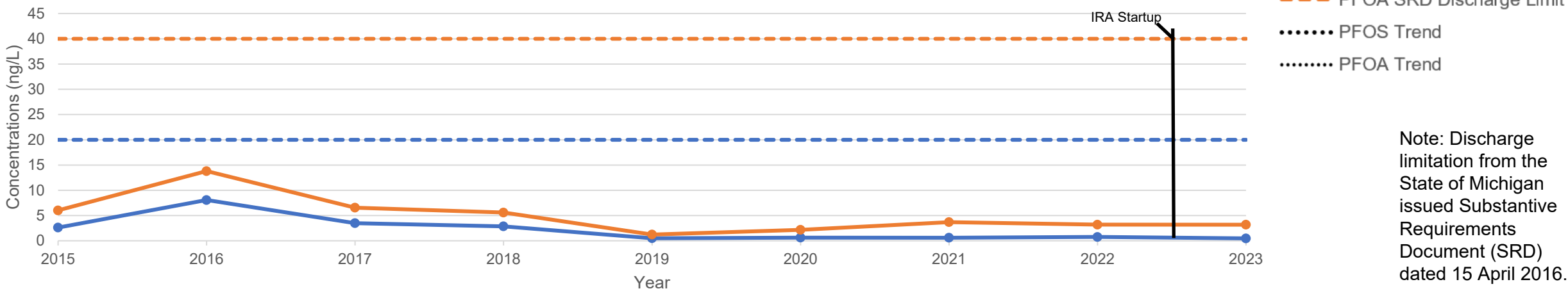
# FT002 Pump and Treat System– Concentration Trend



Average PFOS/PFOA Influent Concentration



Average PFOS/PFOA Effluent Concentration



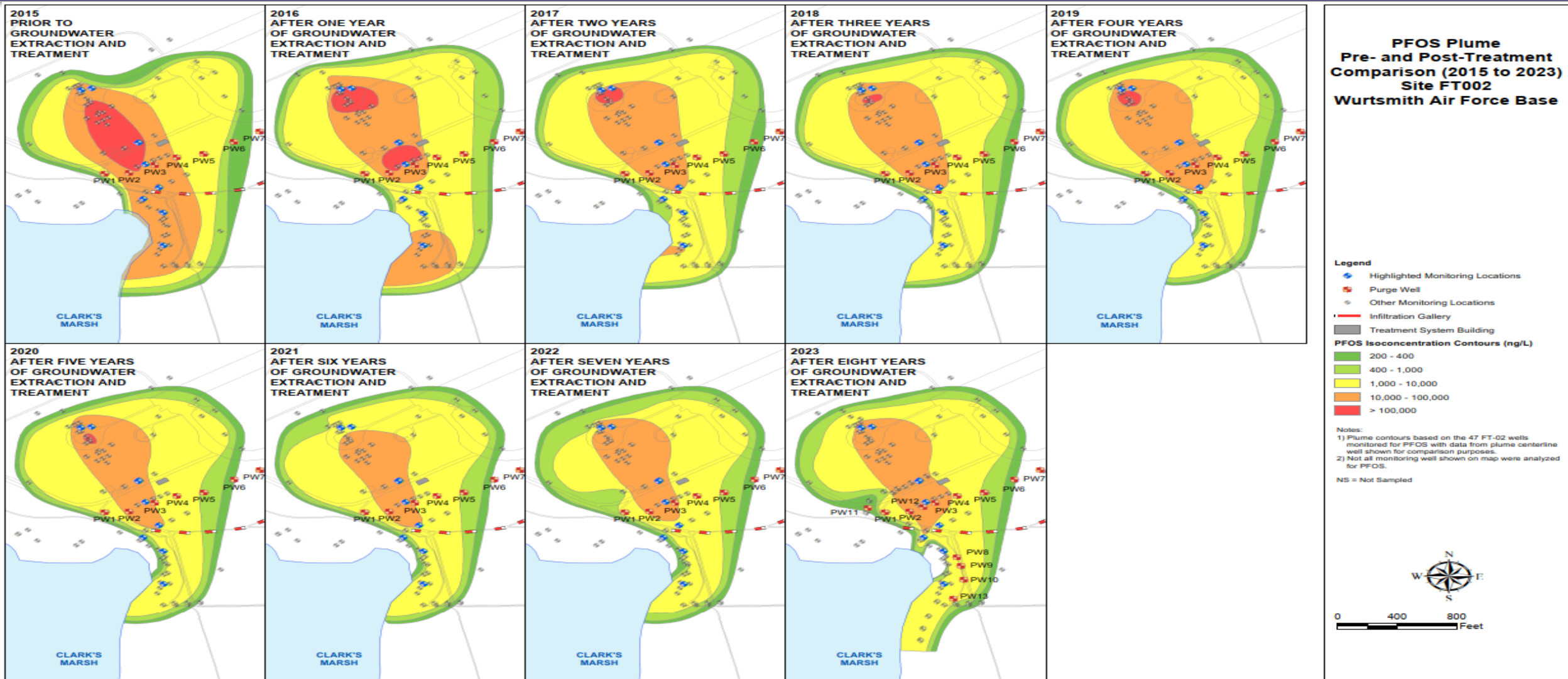
Note: Discharge limitation from the State of Michigan issued Substantive Requirements Document (SRD) dated 15 April 2016.

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# FT002 Pump and Treat System– PFOS Concentration Comparison (2015-2023)



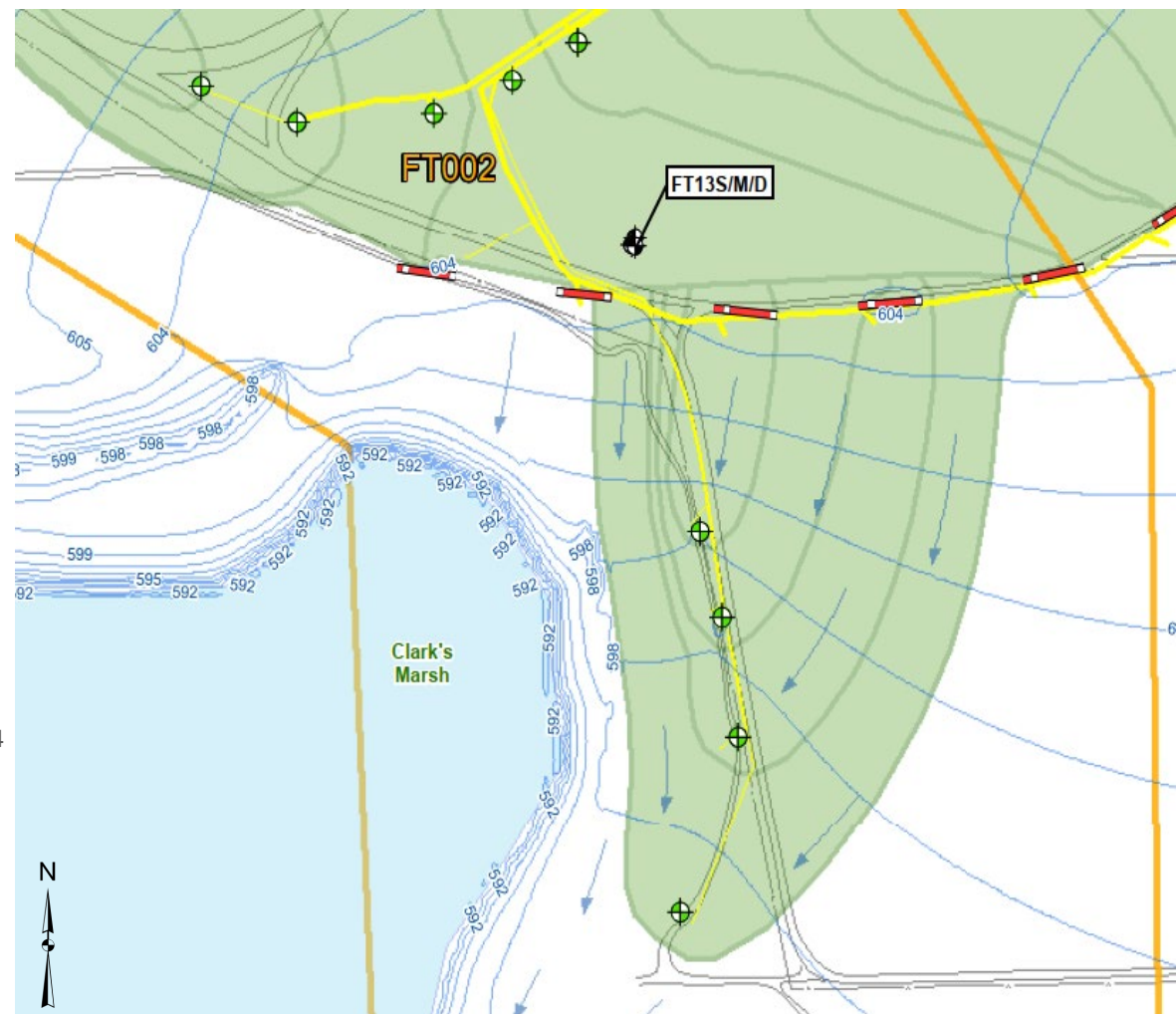
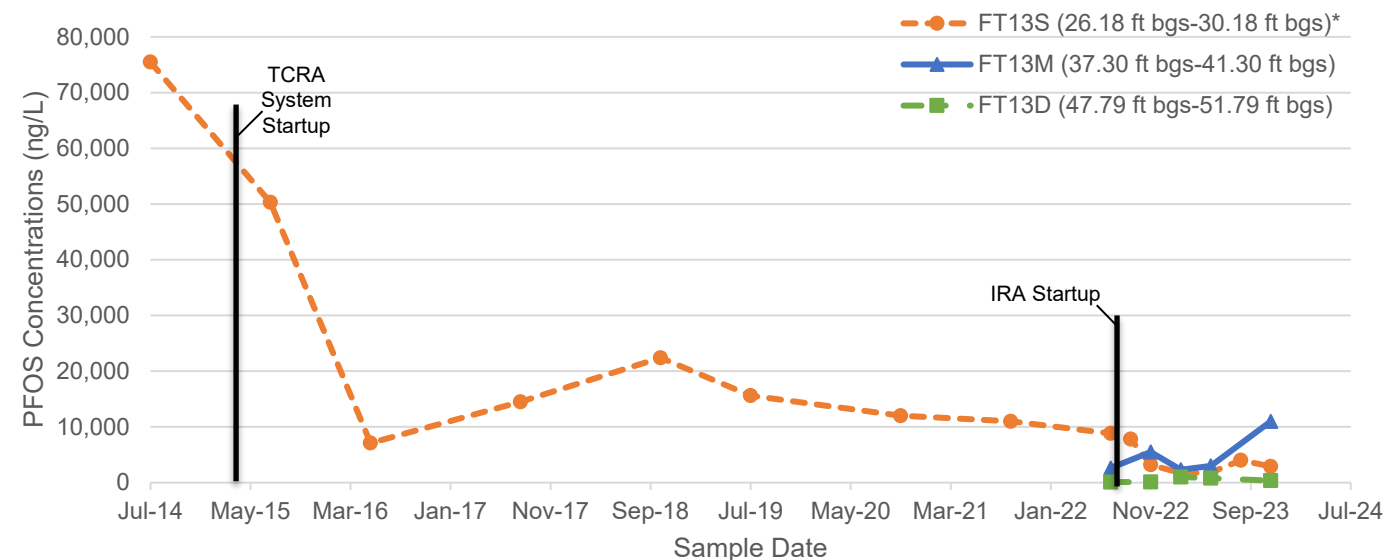
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# FT002 Pump and Treat System– Concentration Trends (Downgradient of Original Extraction Wells)



FT13S/M/D

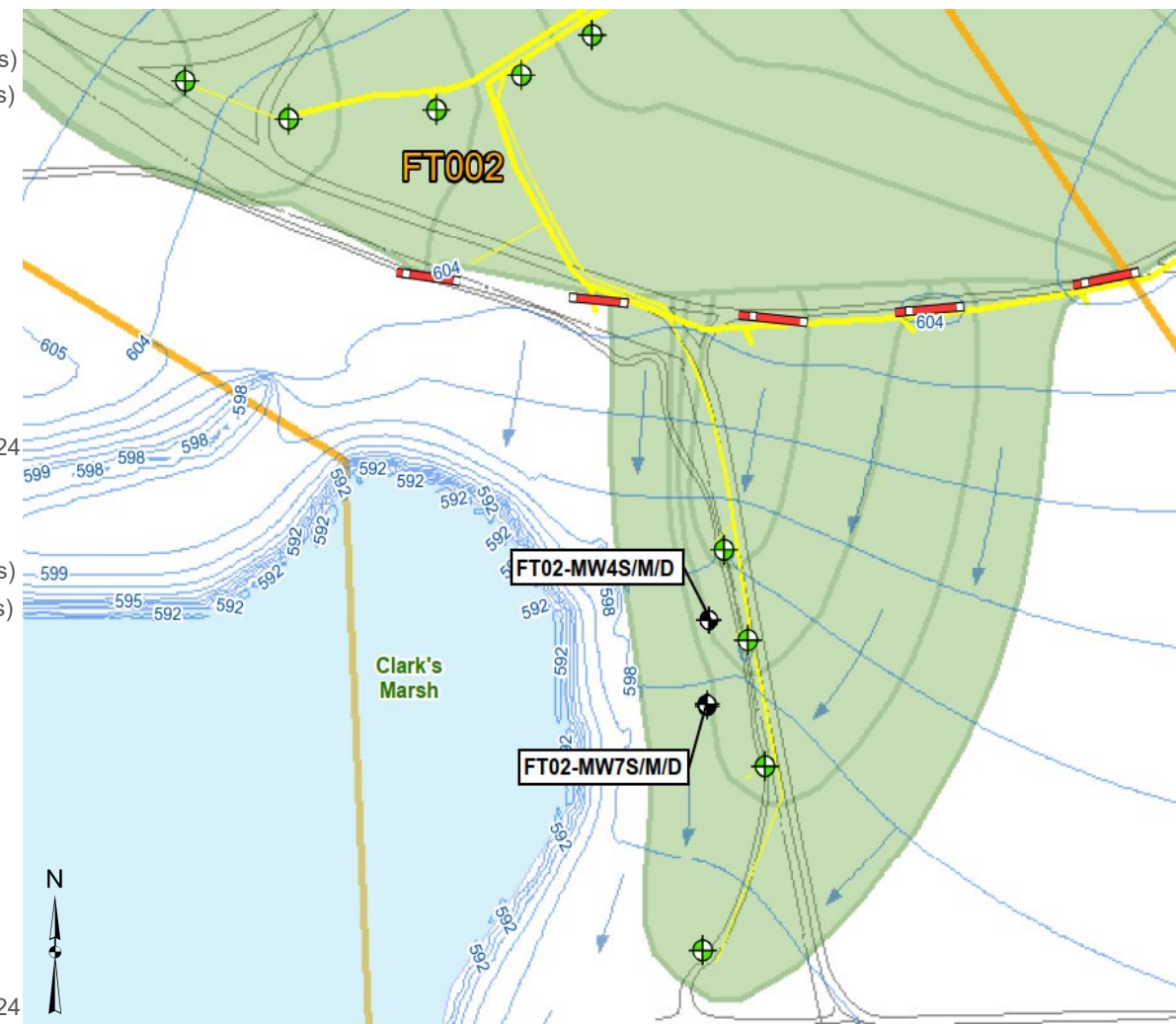
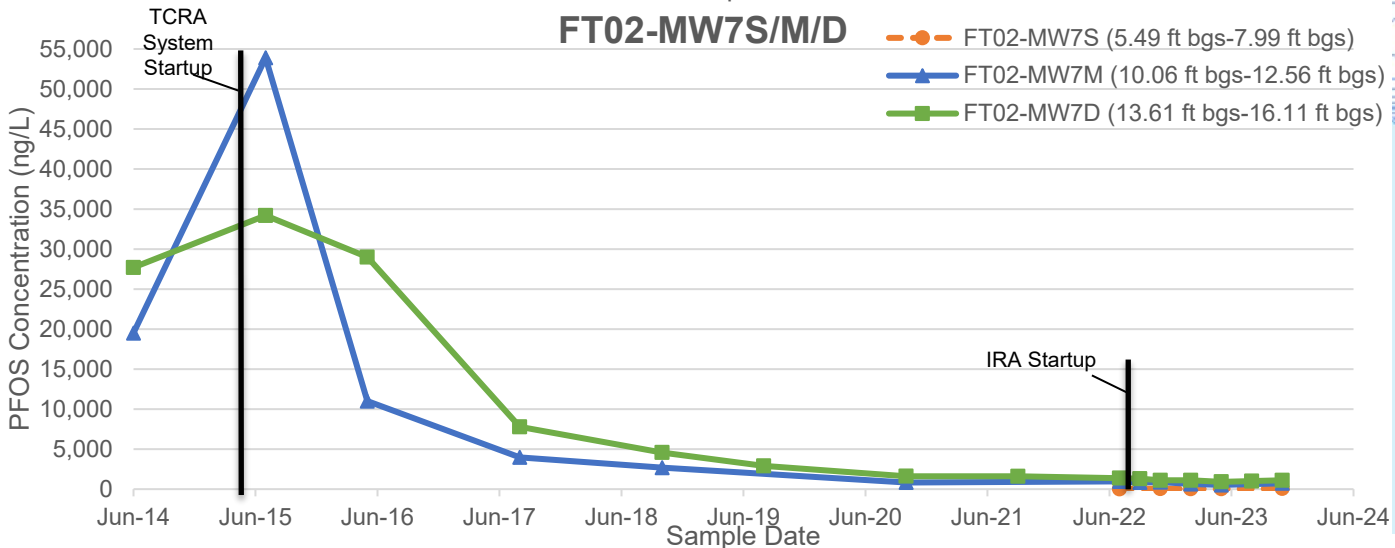
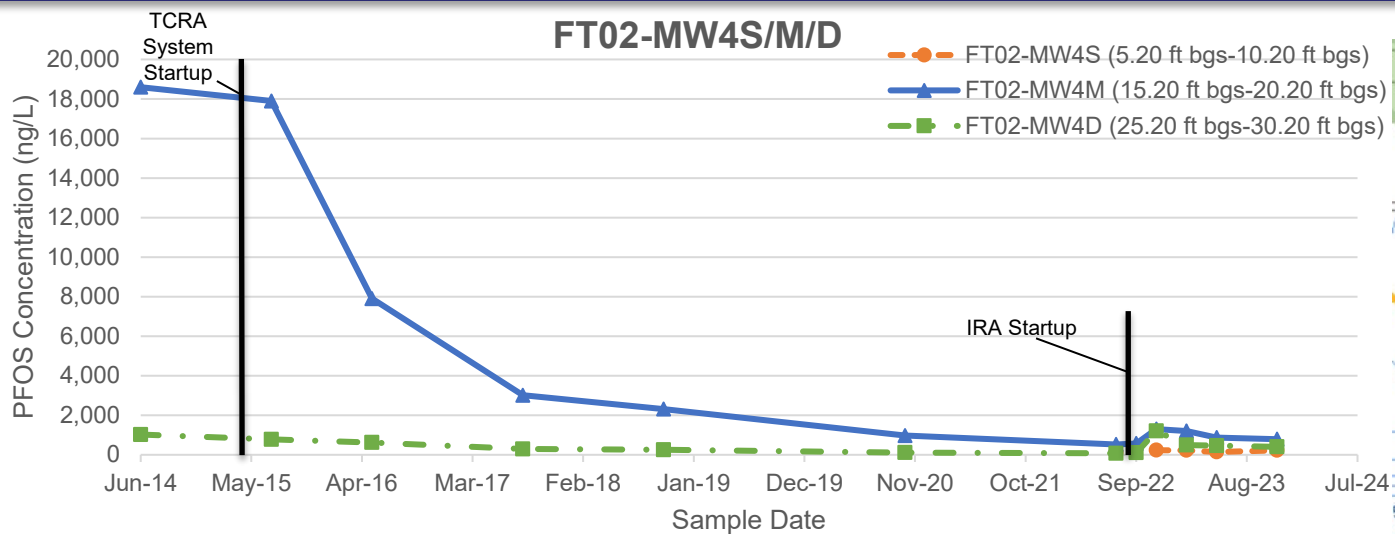


\*Depth intervals of monitoring well screens in feet below ground surface (ft bgs).

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# FT002 Pump and Treat System– Concentration Trends (IRA Capture Zone)

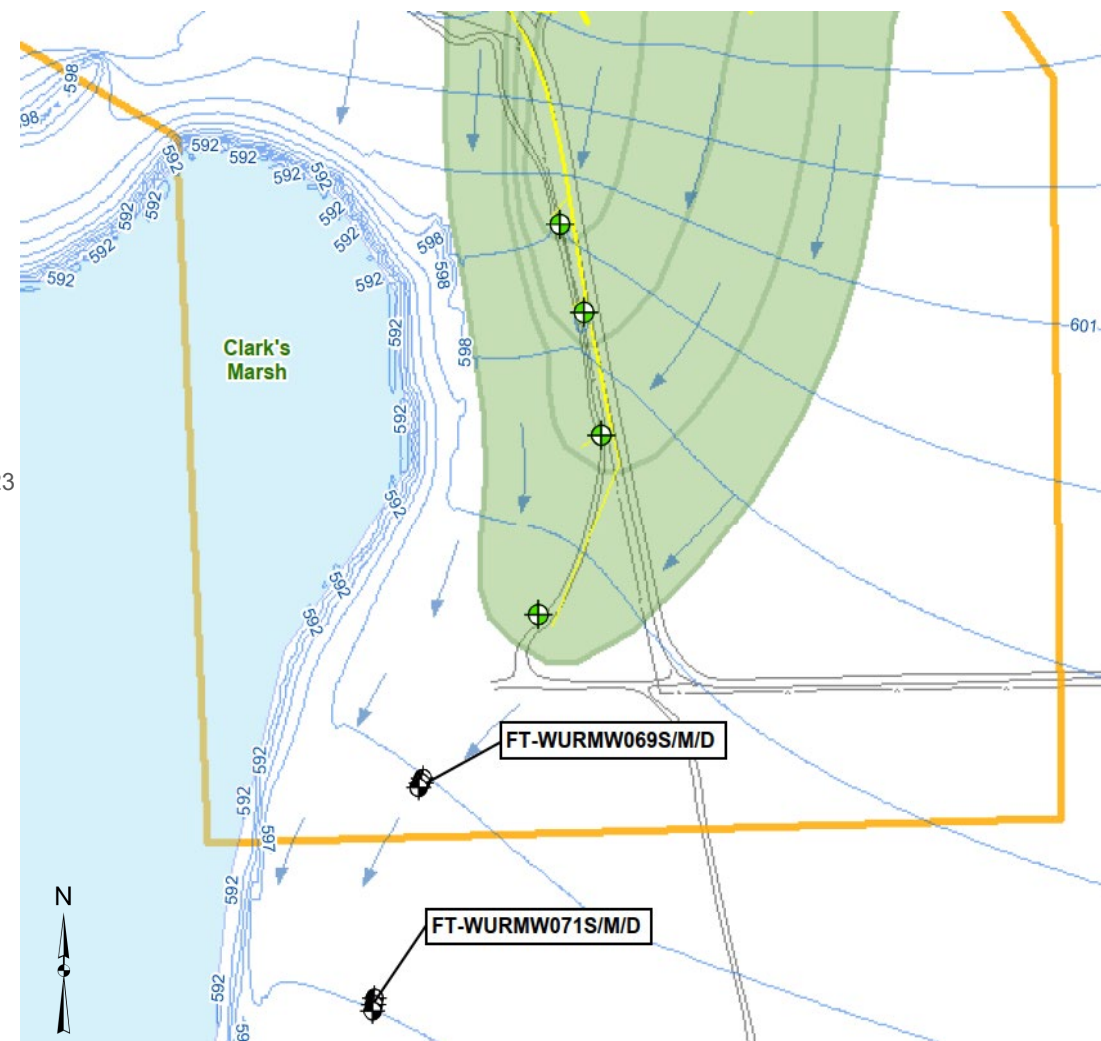
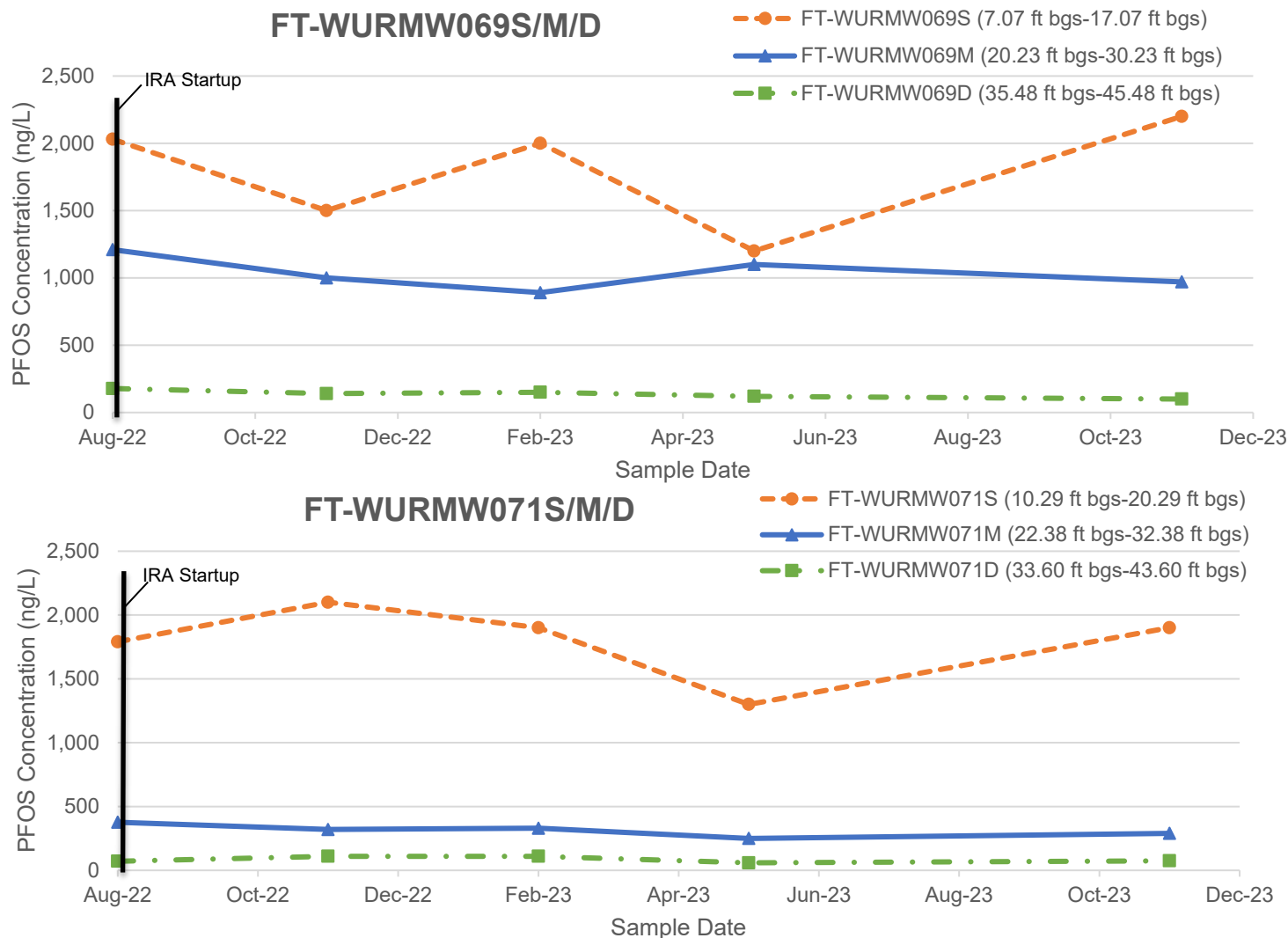


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# FT002 Pump and Treat System– Concentration Trends (Downgradient of CZ)



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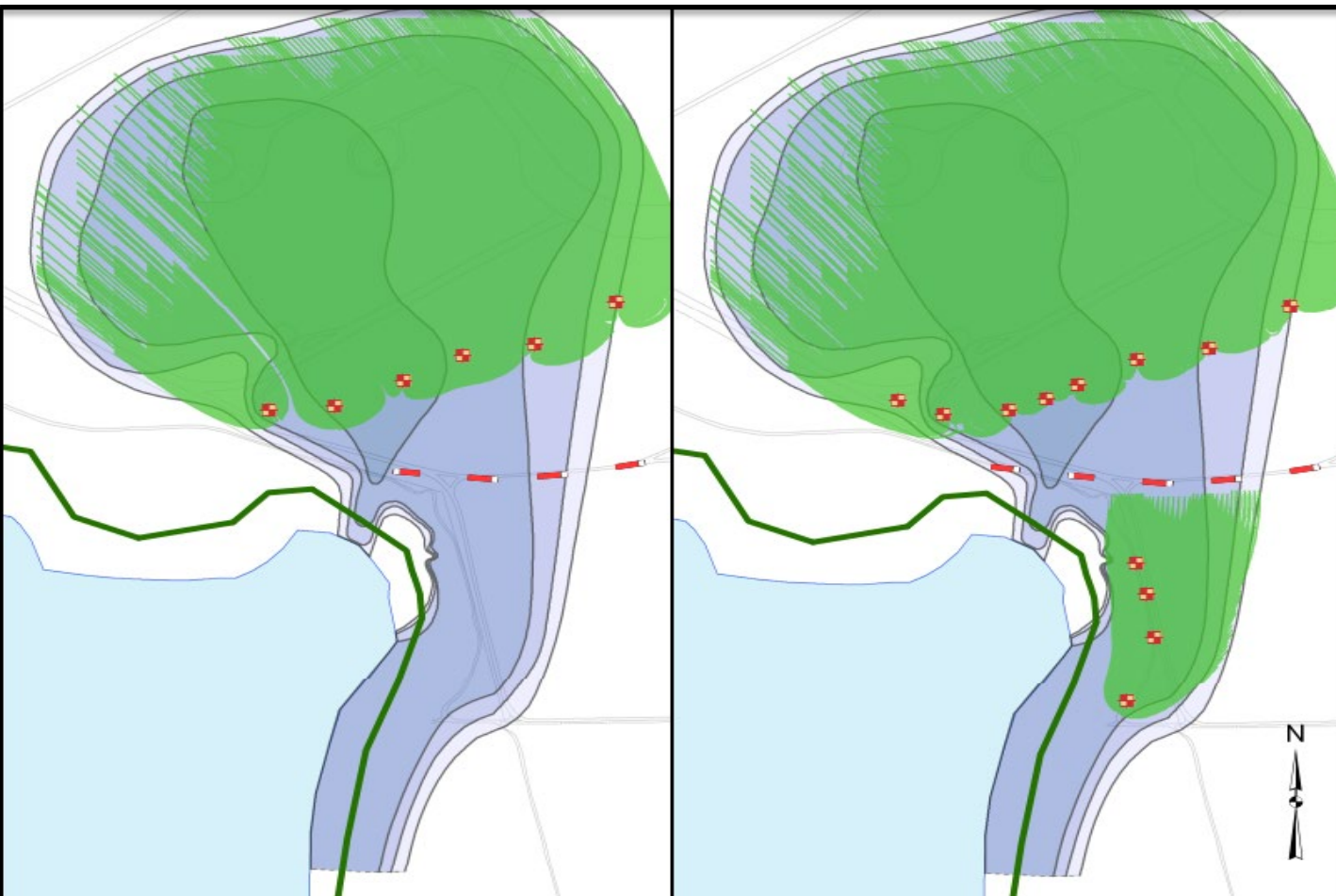


# FT002 Pump and Treat System– Capture Analysis: Hydraulic Evaluation



Pre-System Modification  
Average Rate 1/22-8/22

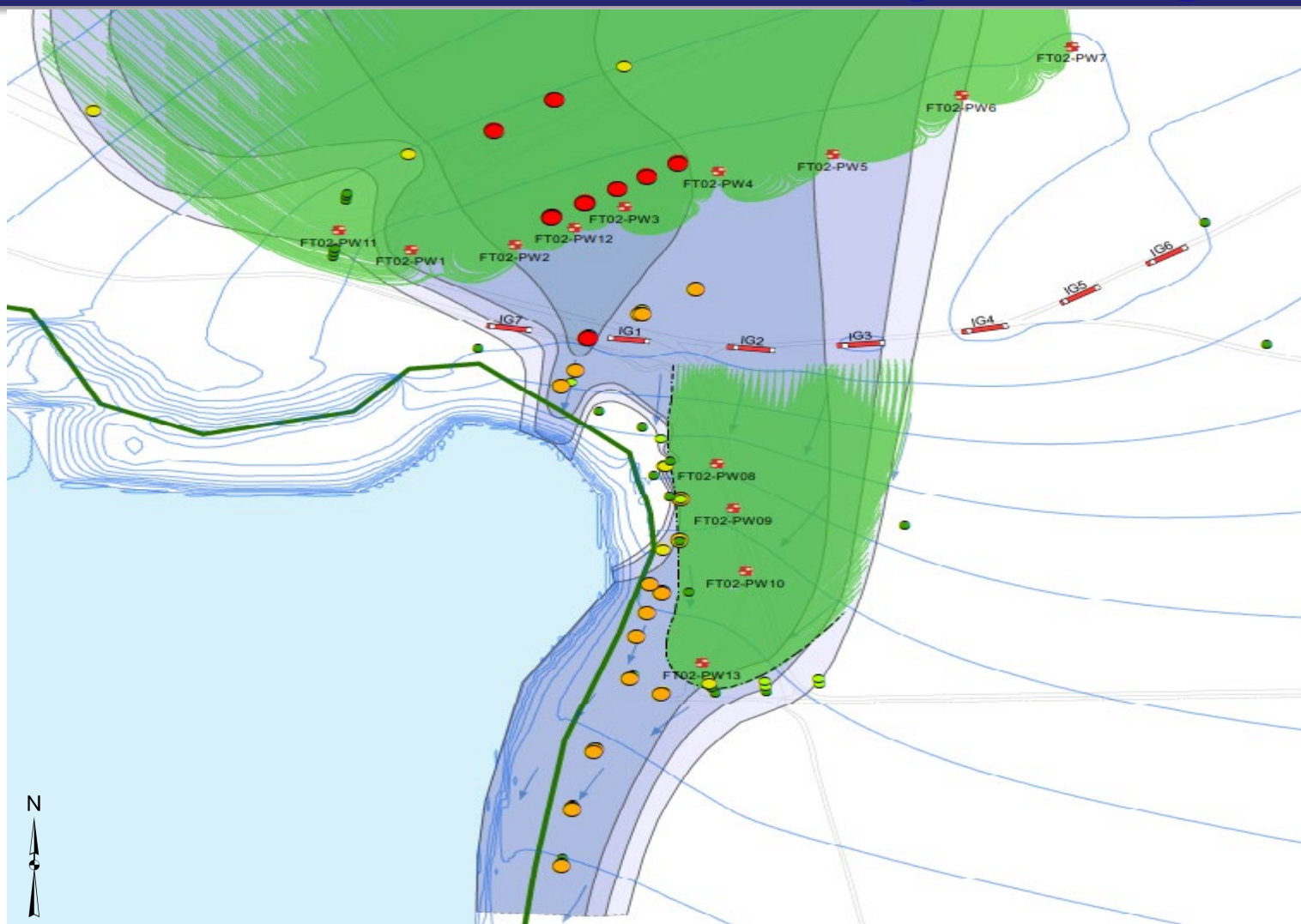
Post-System Modification  
Average Rate 9/22-1/23



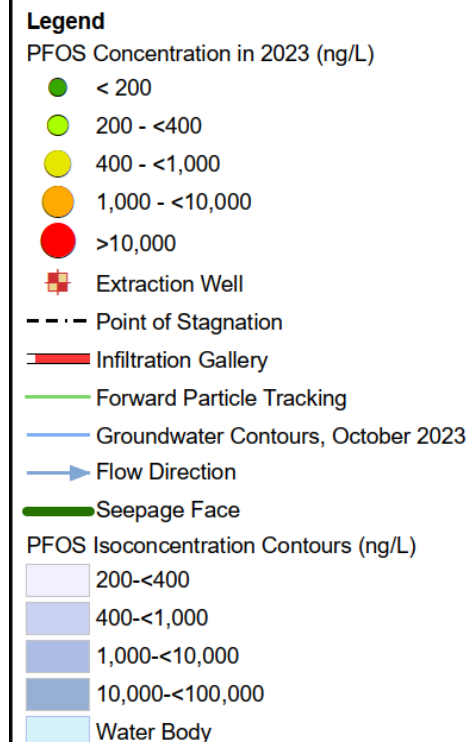
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# FT002 Pump and Treat System– Capture Analysis: Hydraulic Evaluation



## Forward Particle Tracking Release From PFOS Greater than 200 ng/L



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# Summary



- **Goal of IRA was to increase hydraulic control of impacted groundwater migrating from FT002 into Clark's Marsh.**
- **The assessment of the IRA is based on water table drawdown (cone of depression), the radius of influence, and decreasing PFOS and PFOA concentrations downgradient of the extraction well fields.**
- **PFAS Remedial Investigation still in progress to evaluate nature and extent of PFAS migrating into Clark's Marsh.**
- **Following Remedial Investigation, a Feasibility Study will be performed to develop and evaluate final remedial alternatives.**





# USEPA Pump and Treat Guidance: Six Steps for Capture Analysis



## ■ Current Status of new IRAs

- Completed four rounds of groundwater level measurements and sampling
- Mass flux evaluations require concentration evaluations

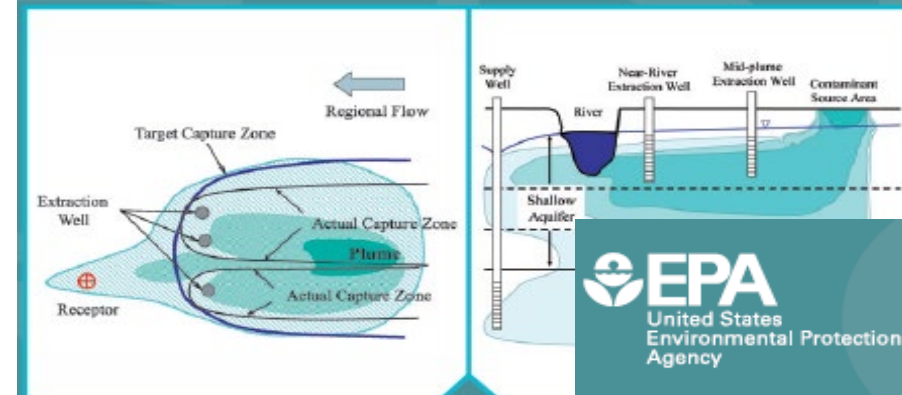
## ■ USEPA Step 5 – Evaluate Concentration Trends

- Not relied upon for short-term evaluation of capture.
- Downgradient performance monitoring wells, outside the capture extents, should decline to background levels over time if capture is successful.
- Interpretation of capture exclusively based on downgradient concentration trends may take years because groundwater flow velocities (and associated concentration changes) are generally quite slow.
- Capture performance based on hydraulic data allow relatively rapid assessments of system performance that complement the more direct, but longer term, assessments provided by concentration trends.

### Six Steps for Systematic Evaluation of Capture Zones

- Step 1: Review site data, site conceptual model, and remedy objectives*
- Step 2: Define site-specific Target Capture Zone(s)*
- Step 3: Interpret water levels*
- potentiometric surface maps (horizontal) and water level difference maps (vertical)
  - water level pairs (gradient control points)
- Step 4: Perform calculations*
- estimated flow rate calculation
  - capture zone width calculation (can include drawdown calculation)
  - modeling (analytical or numerical) to simulate water levels, in conjunction with particle tracking and/or transport modeling
- Step 5: Evaluate concentration trends*
- Step 6: Interpret actual capture based on Steps 1-5, compare to Target Capture Zone(s), assess uncertainties and data gaps*

## A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems FINAL PROJECT REPORT



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