Information Session:
BASF North Works RCRA Cleanup
Wyandotte, MI

August 23, 2023

Valerie Voisin, Hydrogeologist

RCRA Corrective Action

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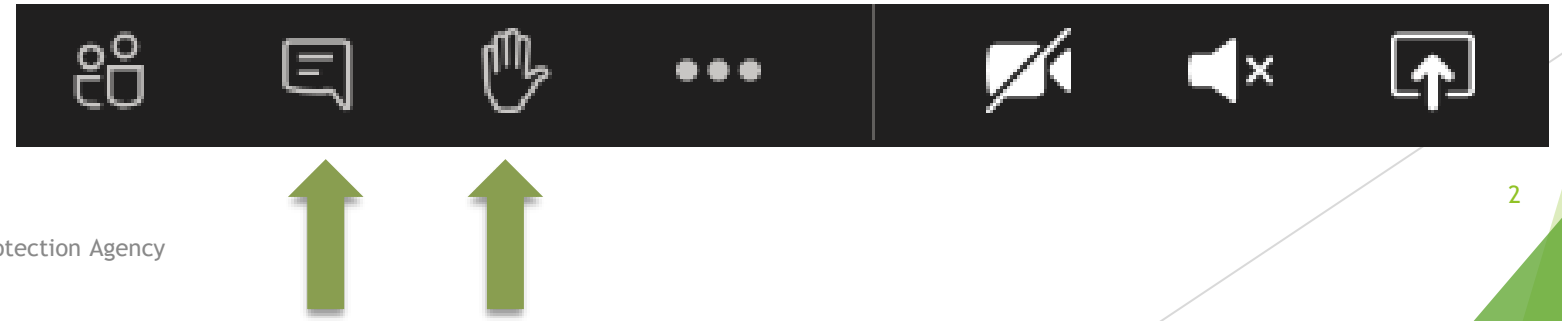
Housekeeping

- Please keep your microphone/phone muted unless speaking
- There will be time for questions after the presentation. At that time, if you wish to ask a question, please raise your hand or enter your name in the “chat” function and the moderator will call on you
- Cameras are optional
- This meeting is not being recorded
- Today's presentation will be later posted online



Agenda

- Opening Remarks
  - Mayor DeSana
  - Congresswoman Debbie Dingell
- Cleanup Overview (EPA-Ed Nam)
- Groundwater Contamination and Remediation (EPA-Valerie Voisin)
- Surface Water and Drinking Water (EGLE)
- Q&A (EPA & EGLE)

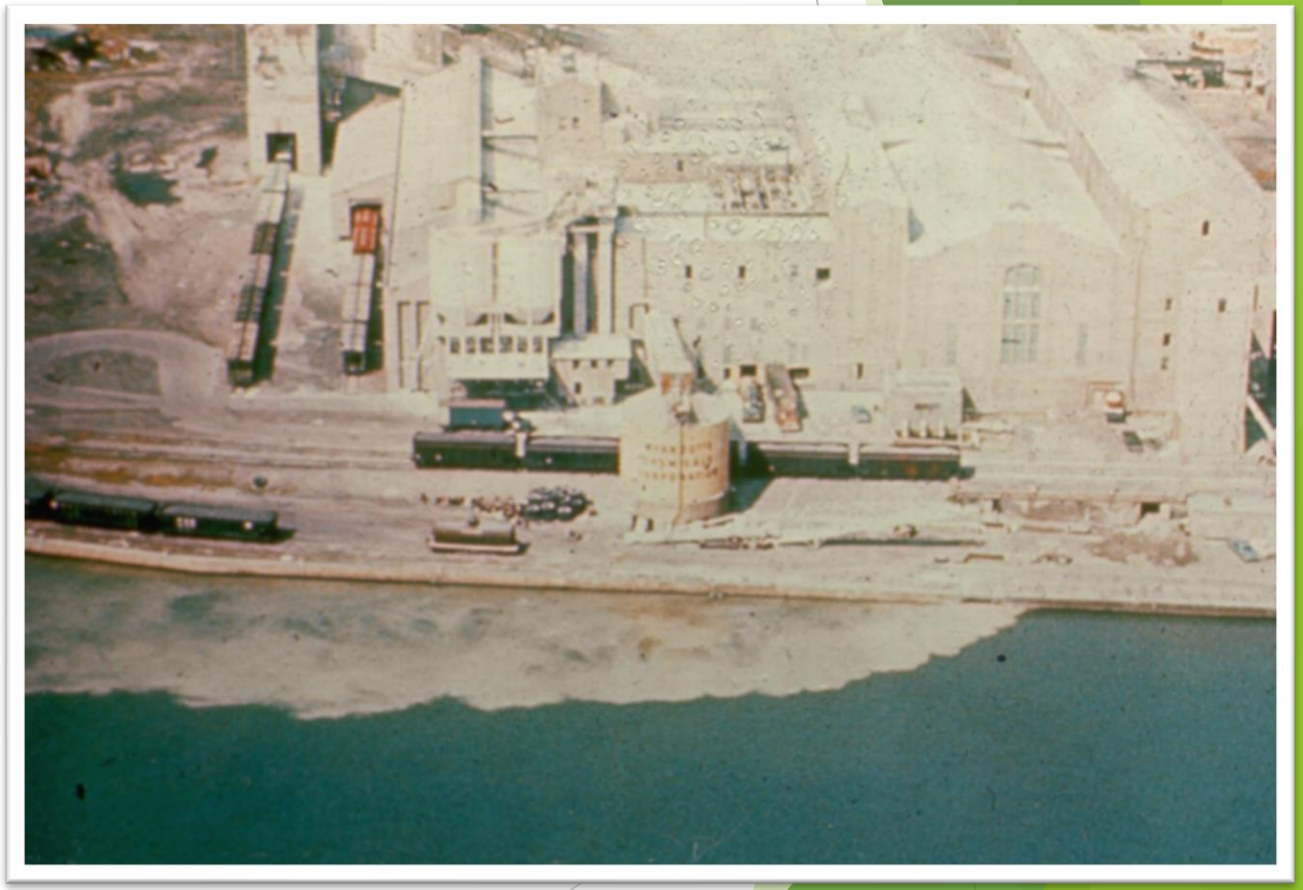
BASF North Works Facility

Site Background

- Industrial use since late 1800s
- Original marshland of the Detroit River drained and filled in the early 1900s
- Active industrial property that manufactures chemicals and other products
- Under a Federal Cleanup Order (RCRA)

Clean Up Process under RCRA Corrective Action

- Site Investigation
- Interim Measures
- Evaluation and Selection of Final Remedy
- Final Remedy Implementation
- Long Term Care

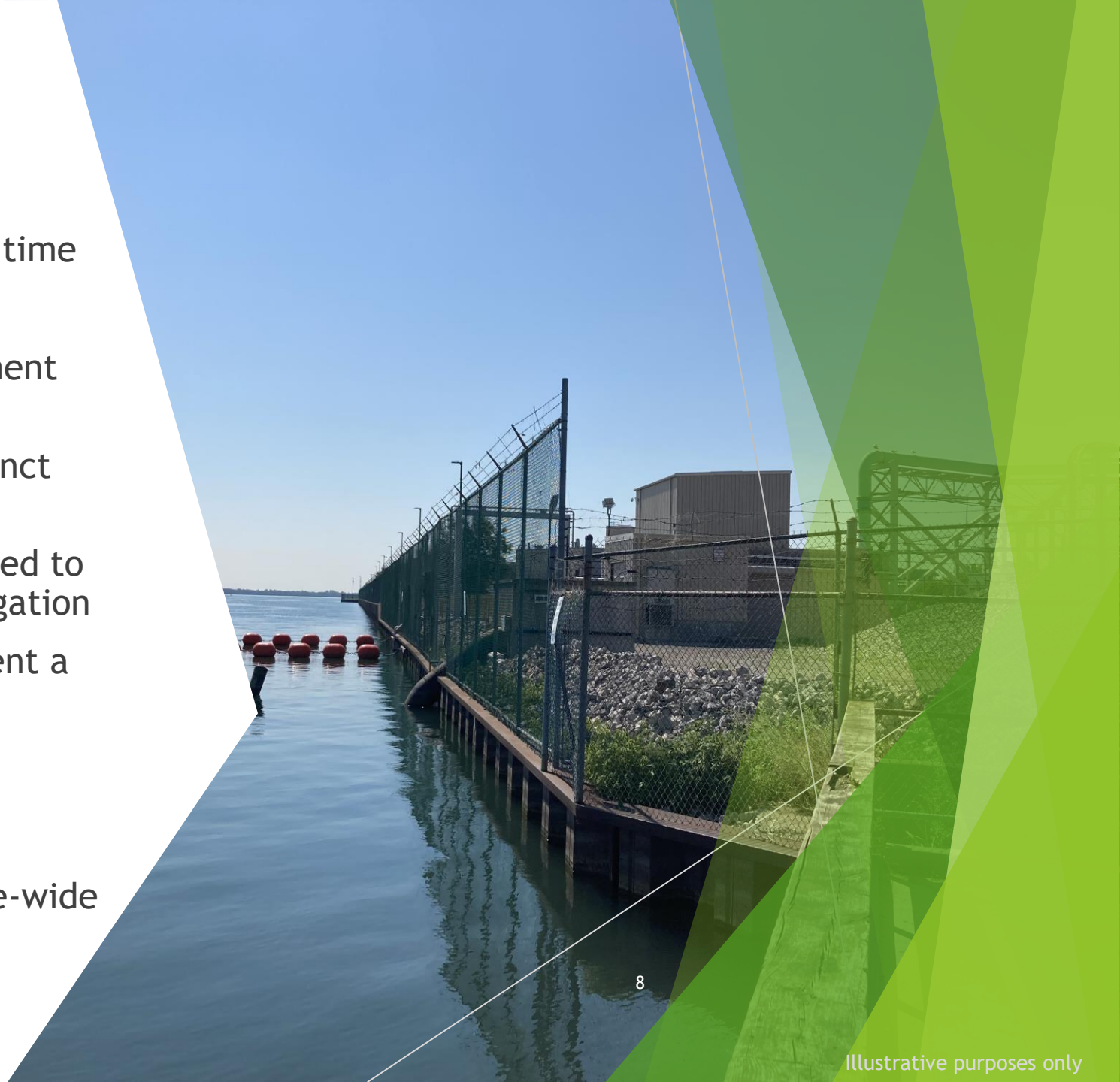


Site Investigations

- BASF has investigated the Site to identify contamination
- Contaminants of Concern
  - Mercury
  - PFAS/PFOS
  - High pH
  - Volatile Organic Compounds (VOCs)
  - Semi Volatile Organic Compounds (SVOCs)
  - Metals
  - Available cyanide
  - DDT (1 location)

How our understanding has evolved

- Understanding of the Site has evolved over time
- Initial focus on potential source areas
  - BASF investigated Solid Waste Management Units and Areas of Concern
  - Remedy proposal focused on these distinct areas
- Extent of groundwater contamination pointed to additional sources requiring further investigation
  - Fill used in historic property development a continuous source of contamination to groundwater
  - Shoreline infrastructure not providing complete hydraulic containment
- Groundwater management needed on a site-wide basis



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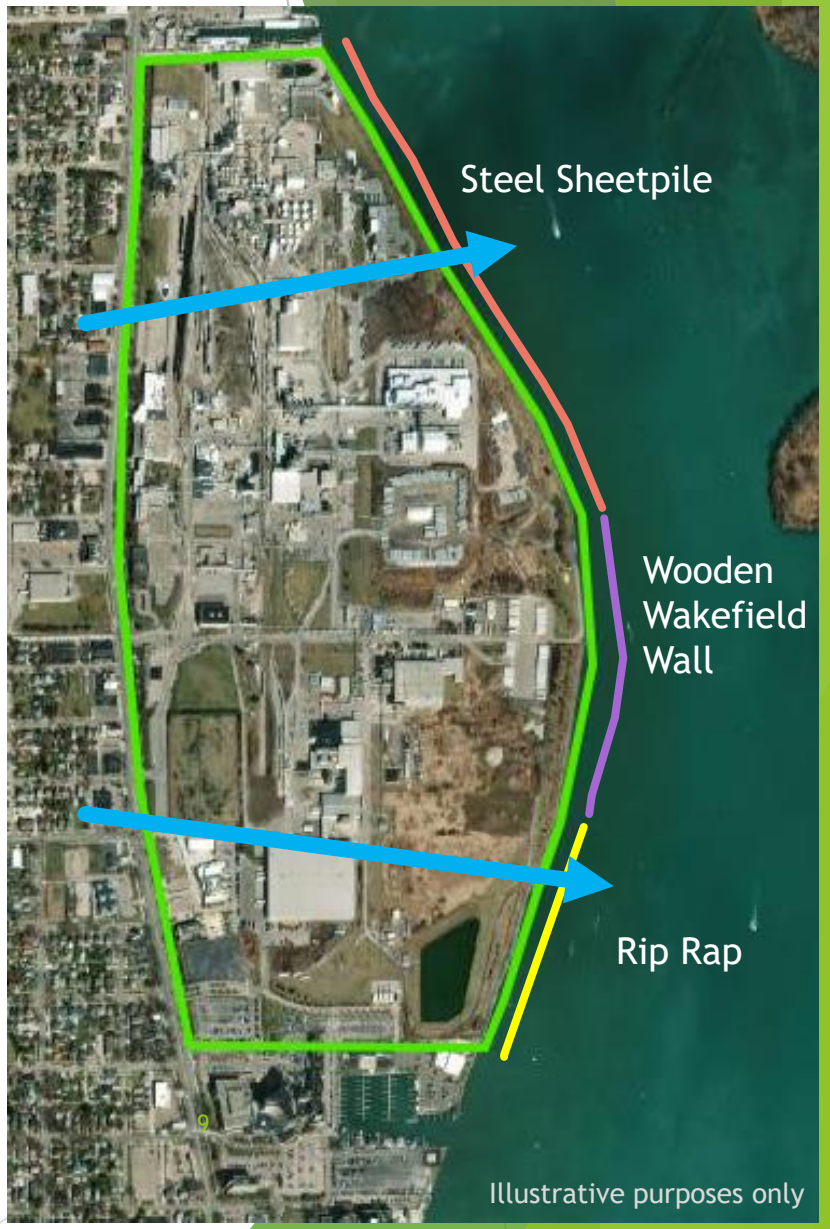
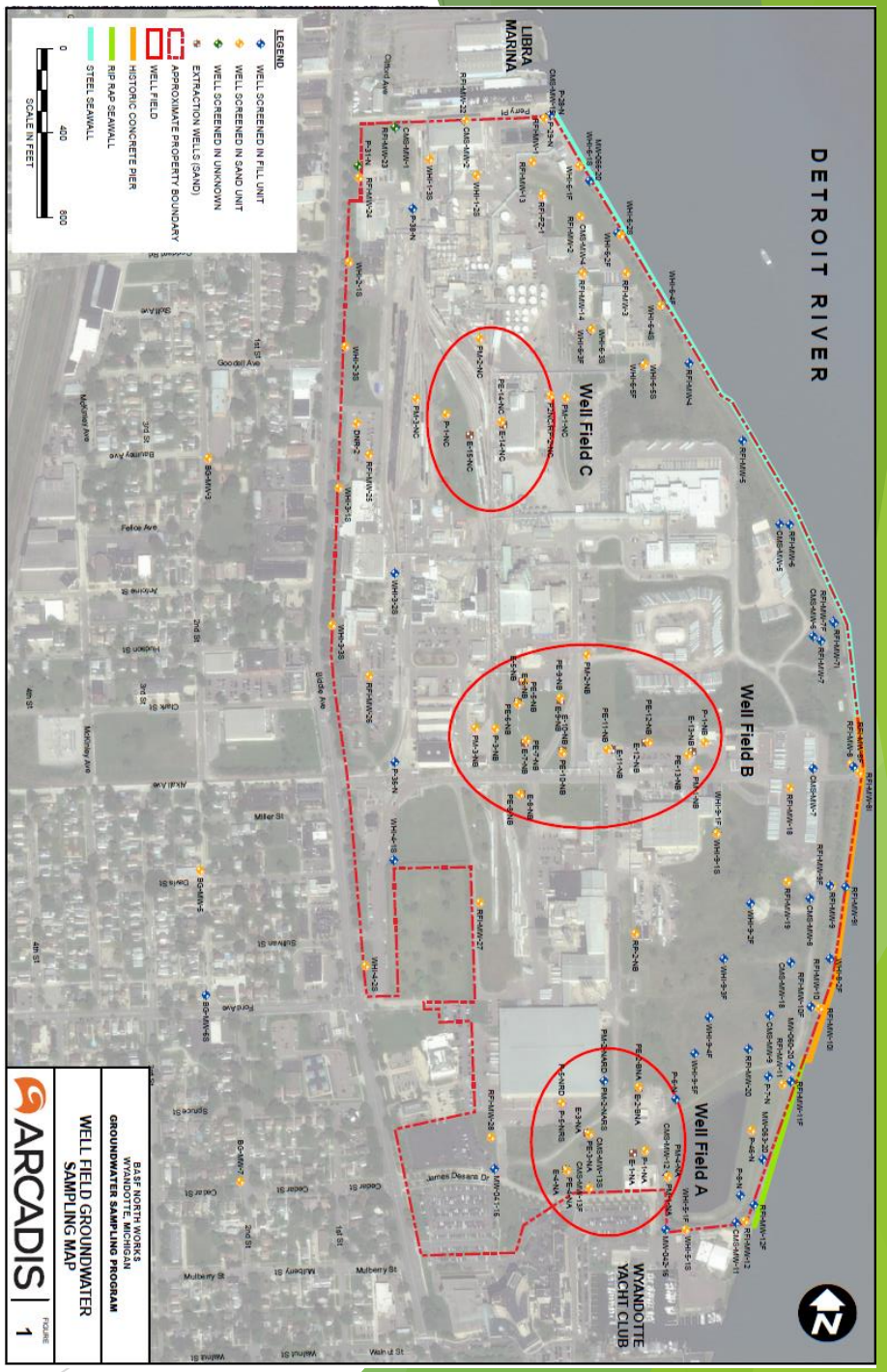
Groundwater

- Groundwater flows across the Site towards the Detroit River
- Underlying geology impacts the groundwater across the site
- The hydraulic conductivity - ability of water to pass through pores and fractured rock - varies widely
- Physical barriers along shoreline affect groundwater movement



Existing Interim Measures
Groundwater Controls

- Systems and structures in place limit groundwater entering the Detroit River
  - Groundwater extraction system
  - Steel seawall
  - Targeted Groundwater Interim Action



Targeted Groundwater Interim Action

- **Development:** In 2022, EPA directed BASF to create a targeted action that can start soon. BASF proposed a groundwater pump and treat system.
- **Current Status:** The Targeted Interim Action was installed by January 2023 and after a permit from Downriver Utility Wastewater Authority (DUWA) was issued on June 9, 2023, the system was put online on July 7,2023.
- **System performance:**
  - Average 9 gallons per minute removal of groundwater
  - Hydraulically conductive area, PFAS impacted zone
  - Treated for PFAS via resin
  - Discharge treated water to DUWA

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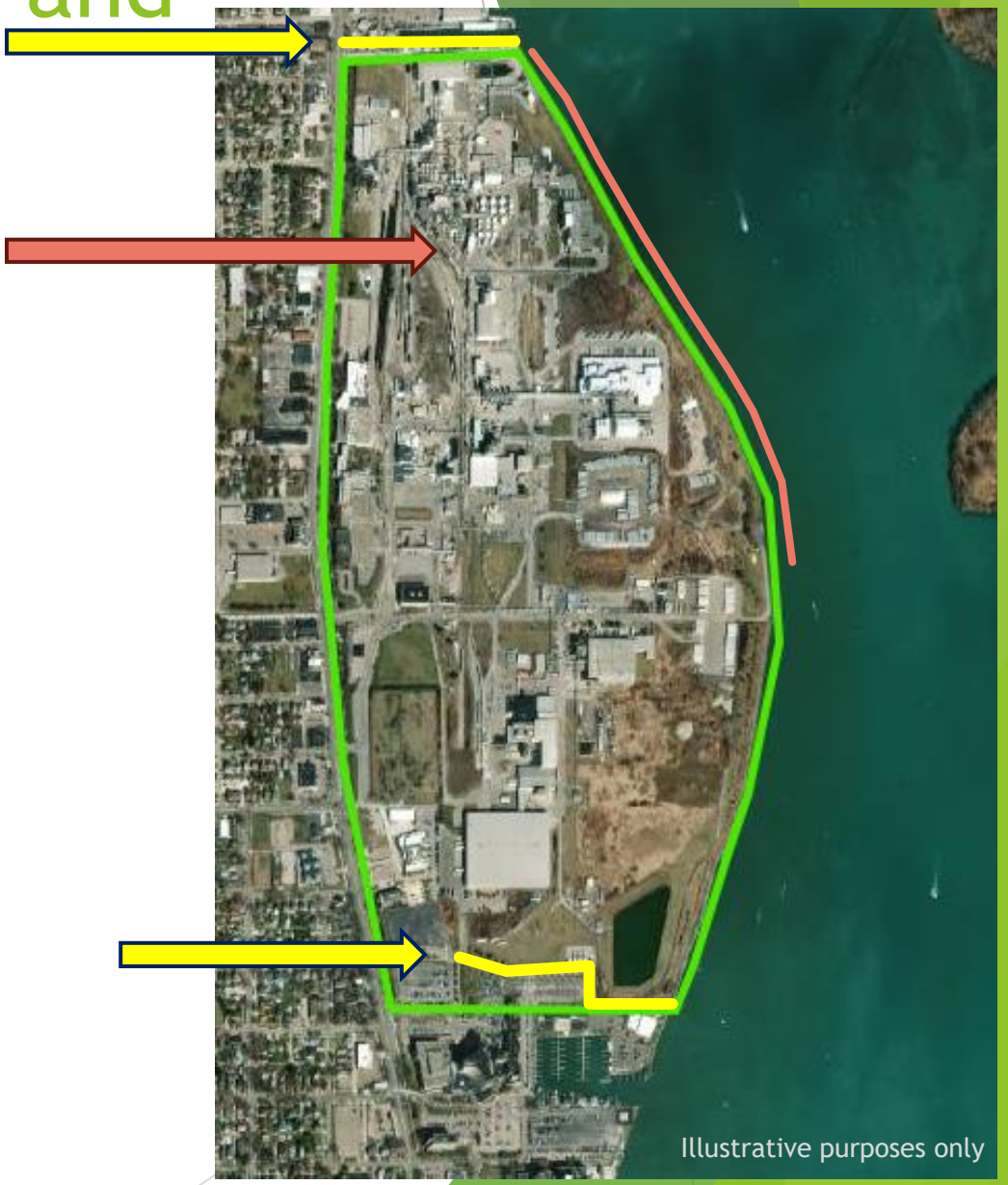
Comprehensive Groundwater Interim Measure

- **Priority:** Prevent all contaminated groundwater from entering the Detroit River
  - Physical barrier for entire downgradient perimeter
  - Groundwater pump and treat on-site

- **Current Status:** On May 25, 2023, EPA selected a remedy; BASF is currently developing the intermediate remedy design due March 2024

Northern Shoreline and Northern and Southern Boundaries

- Northern shoreline (existing 3,300-foot-long sheet pile wall);
  - Utilize existing steel sheet pile walls, embedded into clay layer
  - Inspections, repairs, and measures to ensure wall is water-tight and groundwater is not passing through
- North and South Boundaries
  - North Perimeter in Perry Place and South Perimeter in James Desana Drive.
  - Installation of new sub-surface sheet pile walls
  - Embedded into clay layer to prevent groundwater migration



South Dock ~1,700 feet

- Install new bulkhead wall along the river, embedded into bedrock, to prevent groundwater discharge
- Backfill any open spaces between the wall and the existing wakefield wall to provide structural stability

Rip-Rap Area ~850 feet

- Install a subsurface wall made of soil and cement along the ~850 feet of rip rap at southern boundary with the river to prevent groundwater discharge to the river
- Wall will wrap around the southeastern corner into the southern site boundary
- Then this will connect to the newly constructed sheetpile wall to ensure appropriate GW containment

GW Pump and Treat System

- Groundwater flow will be stopped by physical walls/barriers
- Groundwater will be collected through a trench
- Collection drains along trench
- Collected groundwater will be piped to an on-Site treatment system
- System will be designed to create an inward gradient (i.e. groundwater will instead flow towards the Site and not the river)

Water Treatment Facility (AG Treatment System)

1: Water is pumped into tanks

2: Neutralized to reduce pH

3: Metals are removed

4: Suspended solids are filtered out

5: Granulated activated carbon; removes VOC, Mercury, SVOCs, PFAS/PFOS any remaining solids

6: Final resin polish; removes remaining PFAS/PFOS

7: Discharge to permitted facility

Remedy Summary:

Perimeter Barriers:

- Soil-cement walls
- Repair existing steel-sheetpile
- Install new steel sheetpile

GW collection trench and treatment facility

- Collect groundwater along entire perimeter and sends to treatment facility
- Treatment facility removes VOC, SVOC, Mercury, Metals, PFAS and pH prior to permitted discharge

Current Implementation Schedule and Next Steps

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- Melinda Steffler, Water Resources Division
- Ian Smith, Drinking Water and Environmental Health Division

Surface Water Discharges

- National Pollutant Discharge Elimination System (NPDES) Permit
- Three (3) Outfalls
- Storm water, process water, and groundwater infiltration
- Observation and sampling requirements
- 5 Year Permit Cycle
- https://mienviro.michigan.gov/nsite/

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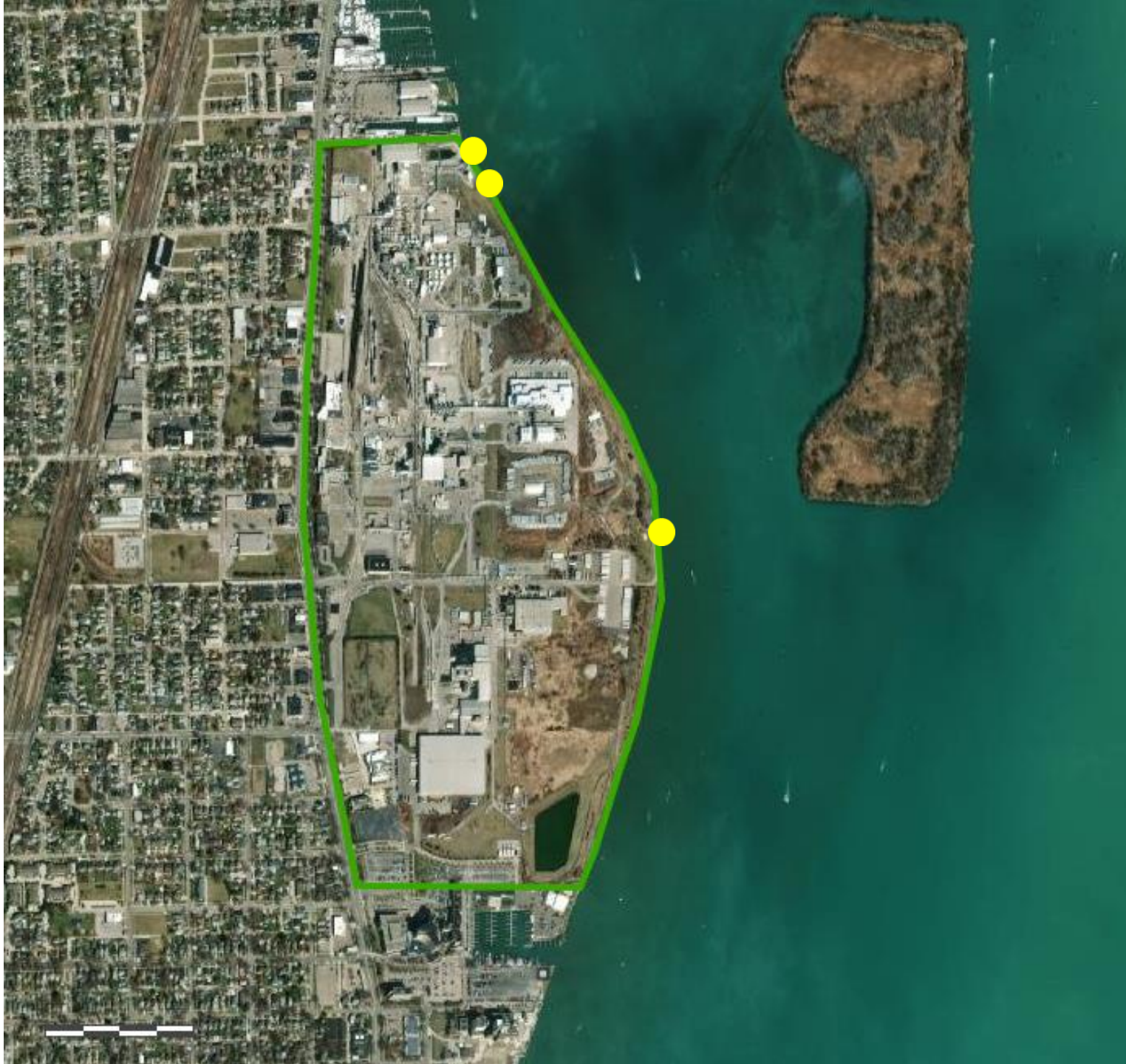
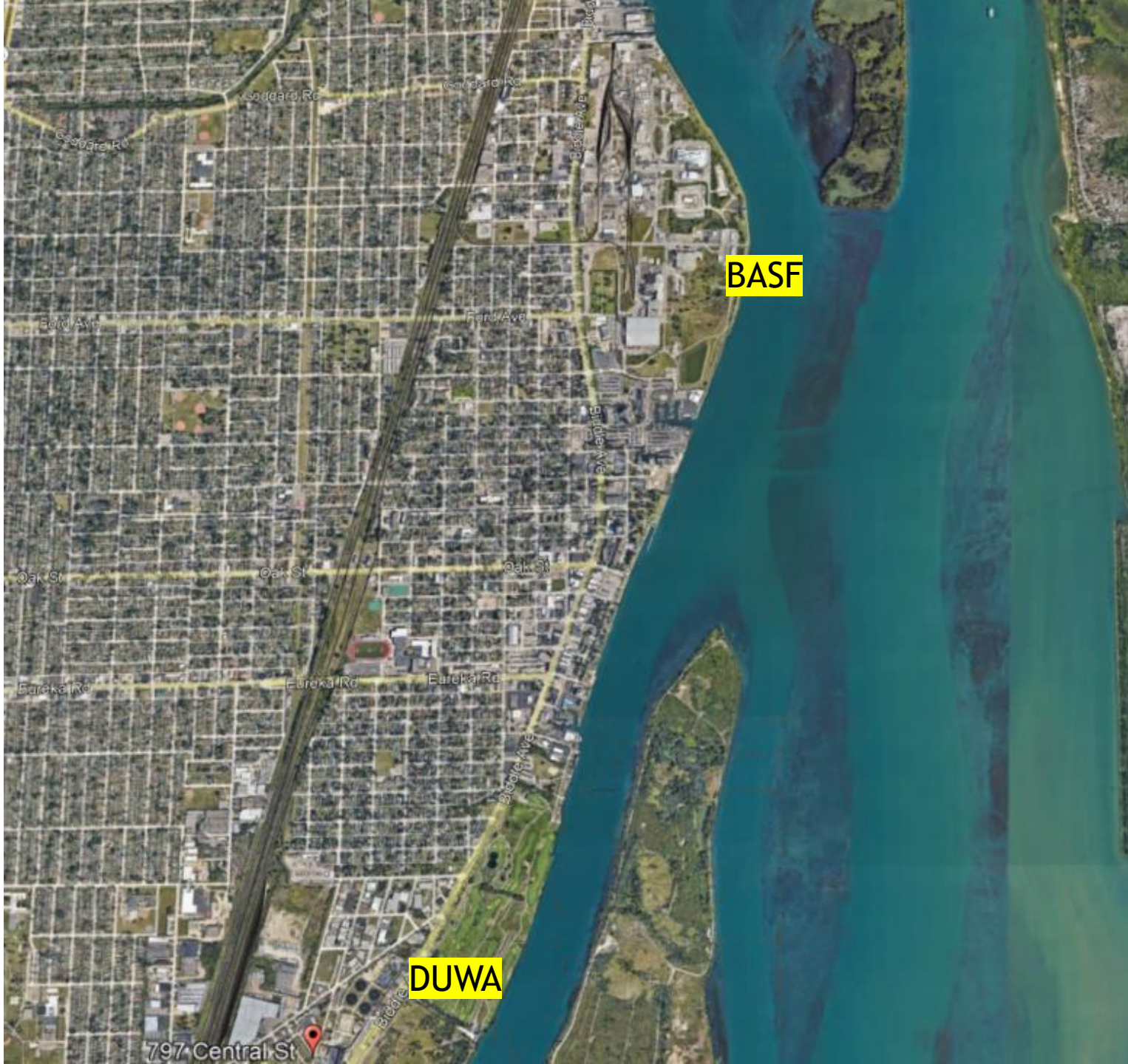


Surface Water Discharges

- Sanitary wastewater and some process flows, including contaminated groundwater, go to the local wastewater treatment plant
  - Downriver Utility Wastewater Authority (DUWA)

- DUWA is also subject to NPDES Permit requirements

- Industrial Pretreatment Program



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PFAS Study

- Outfall sampling for PFAS began in 2018, upon request from EGLE Water Resources Division (WRD)
- Outfall 001 exceeded Water Quality Standards for PFOS
- PFAS Source ID Study
- December 2021 study indicated that groundwater contaminated with PFAS infiltrated the sewer system

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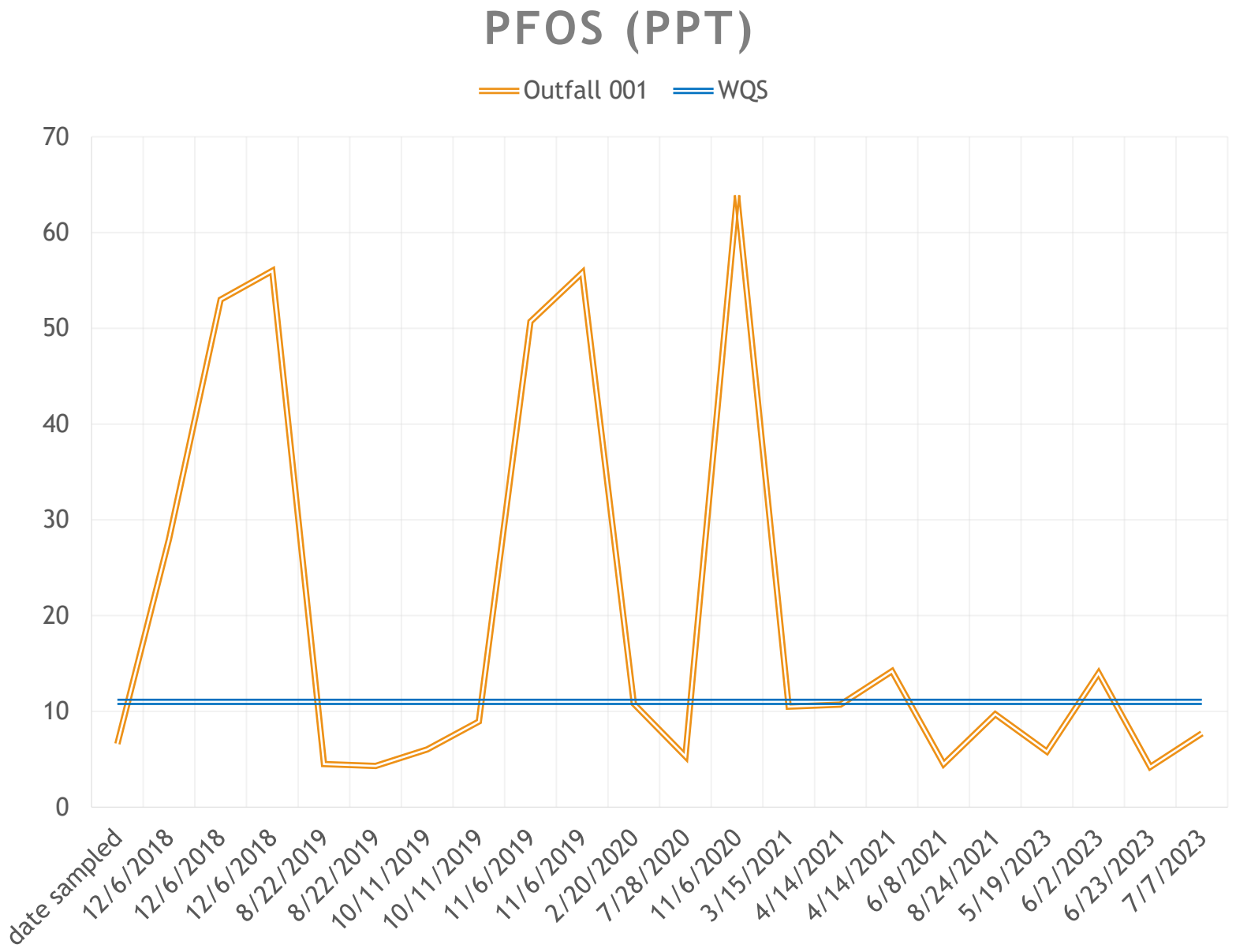
Next Steps

- Consent Order
- Deadline to meet Water Quality Standards (WQS)
- Permit Issuance



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Venting Groundwater Analysis

- January 2022 EGLE WRD review
  - Groundwater volume
  - Pollutant concentrations
  - Flow volume/mixing patterns
  - Water intake location

- Conclusion
  - Pollutants not expected to exceed drinking water criteria at the intake

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Wyandotte Drinking Water Plant

- Conventional treatment plant, not designed to remove PFAS
- Single intake
  - 42 in diameter pipe
  - Approximately 1,500 ft off river shore
  - Approximately 20 ft under water

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C2R2 Grant – Planned Upgrades
(Consolidation and Contamination Risk Reduction)

- Systems eligible to apply with a contaminant result greater than 50% of a maximum contaminant level (MCL)
- Awarded funds in December 2021 to replace filter media with granular activated carbon (GAC) to provide another public health protection barrier
- As of August 2023, the City has received approval by the utility commission, and has moved forward with a feasibility study and design phase.
- EGLE continues to monitor sampling results and is working with the City through this process.

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Wyandotte Drinking Water Plant

- Monthly PFAS sampling in 2019, initially
  - Two detections in raw water:
    - July 2019 sample 2 ppt PFOS
    - August 2019 sample 49 ppt PFOS
  - One detection in treated water:
    - August 2019 sample 26 ppt PFOS
  - Moved to weekly samples for the remainder of 2019, all non-detect
- 2021 bi-monthly intake/raw PFAS samples all non-detect

Wyandotte Drinking Water Plant

- 2022 weekly intake (raw) PFAS samples (April - September)
  - April sample PFOA & PFOS (2-5 ppt), PFOSA (42-95 ppt)
  - PFOSA detect notable – conducted subsequent sampling
  - All other samples were non-detect
- 2023 weekly intake (raw) PFAS samples (March - present, ongoing)
  - All sample results have been below the minimum reporting level (2 ppt)
- City is monitoring PFAS under MI Safe Drinking Water Act as of 2020
  - Monthly plant tap and intake (raw) samples have been non-detect for PFAS
  - Also, VOC and mercury have been non-detect

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Questions?

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