



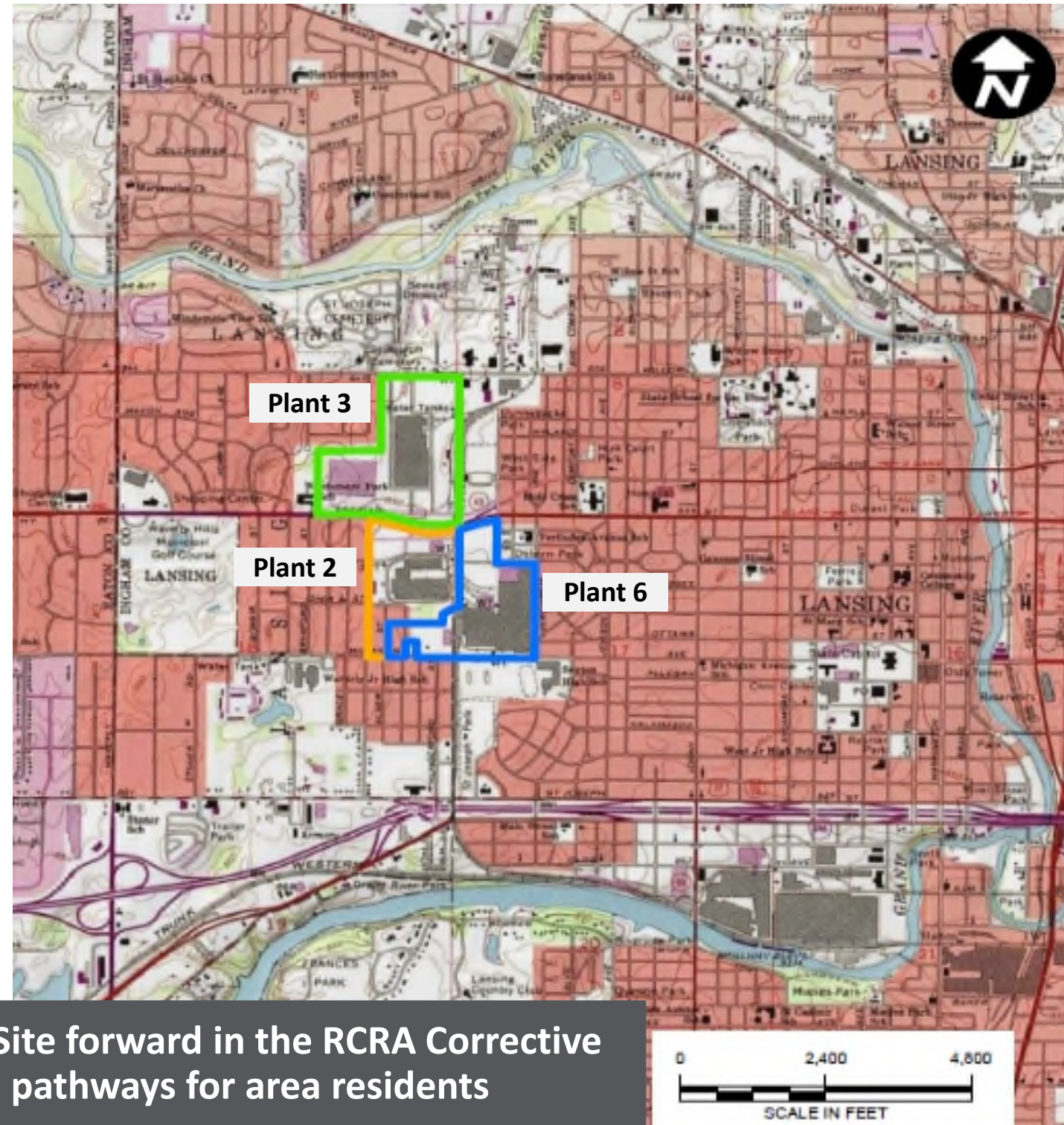
RACER TRUST LANSING PLANTS 2, 3, & 6

2023 Fourth Quarter Progress Report | January 15, 2024

More detailed reports are available on RACER's Webpage for this Site:
<https://www.racertrust.org/properties/lansing-plant-2-industrial-land>

Site Introduction

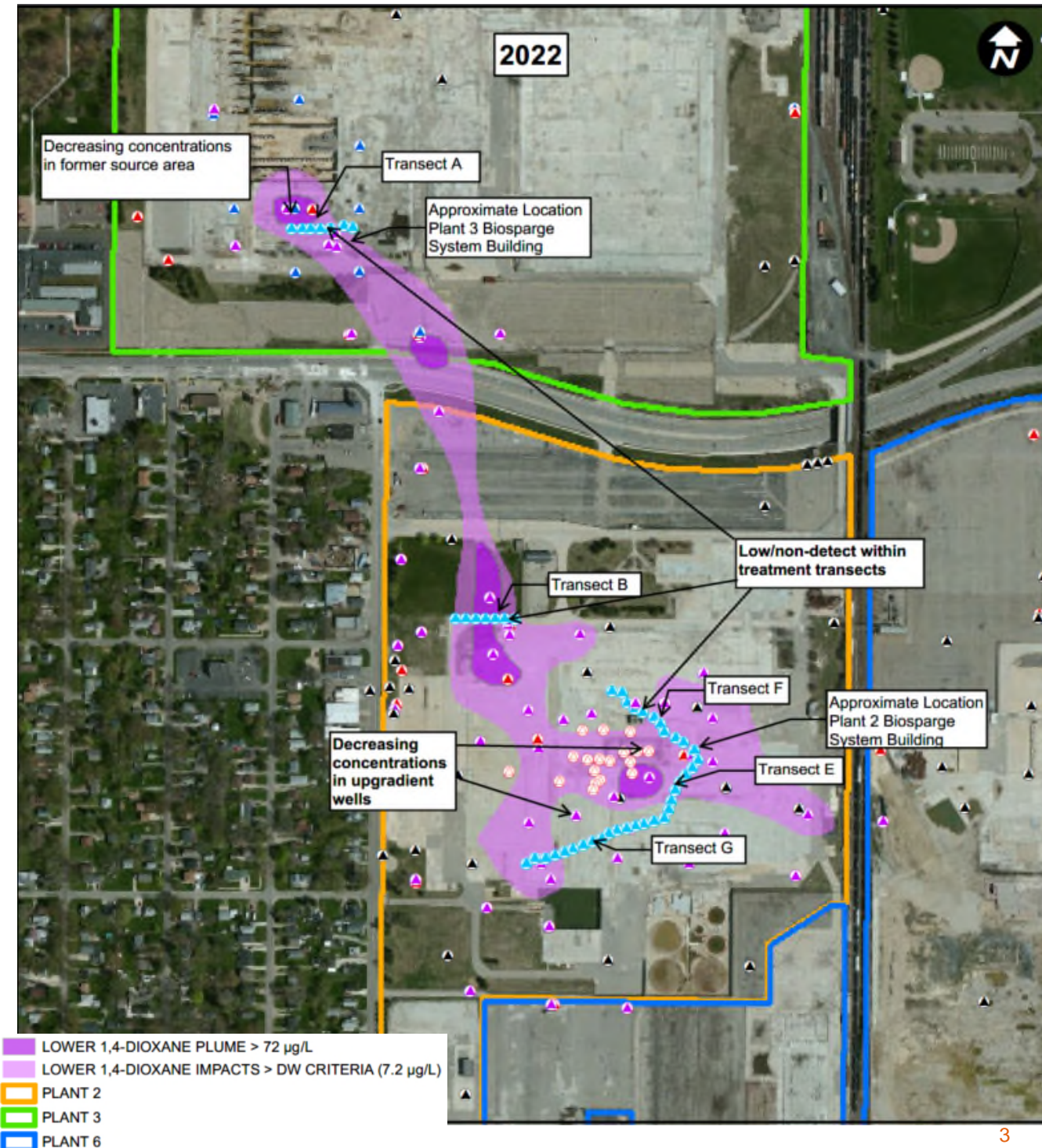
- Remediation at the RACER Lansing Site is being performed through the Resource Conservation and Recovery Act (RCRA) Corrective Action program under the oversight of the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Current activities include focused site characterization, and interim remedial actions.
- There is currently no known exposure pathways for area residents associated with the site contaminants.
- Characterization of the 1,4-dioxane plume in weathered bedrock at a depth of approximately 60 to 75 feet below the ground surface is complete. Remediation of 1,4-dioxane in the weathered bedrock includes operation of the Plant 2 and Plant 3 biosparge systems (The Plant 3 system began operating in 2019 and the Plant 2 system began operating in 2020). It is anticipated that portions of the Plant 2 and Plant 3 biosparge systems may need to operate for several more years. See the appendix at the end of this report for more information on biosparging.
- Routine groundwater monitoring on and in certain areas adjacent to Plants 2, 3, & 6 in the shallow (perched) zone, weathered bedrock, shallow bedrock, and deep bedrock is ongoing and is anticipated to continue for many years.



Activities completed during this period move the Site forward in the RCRA Corrective Action process and verified no complete exposure pathways for area residents

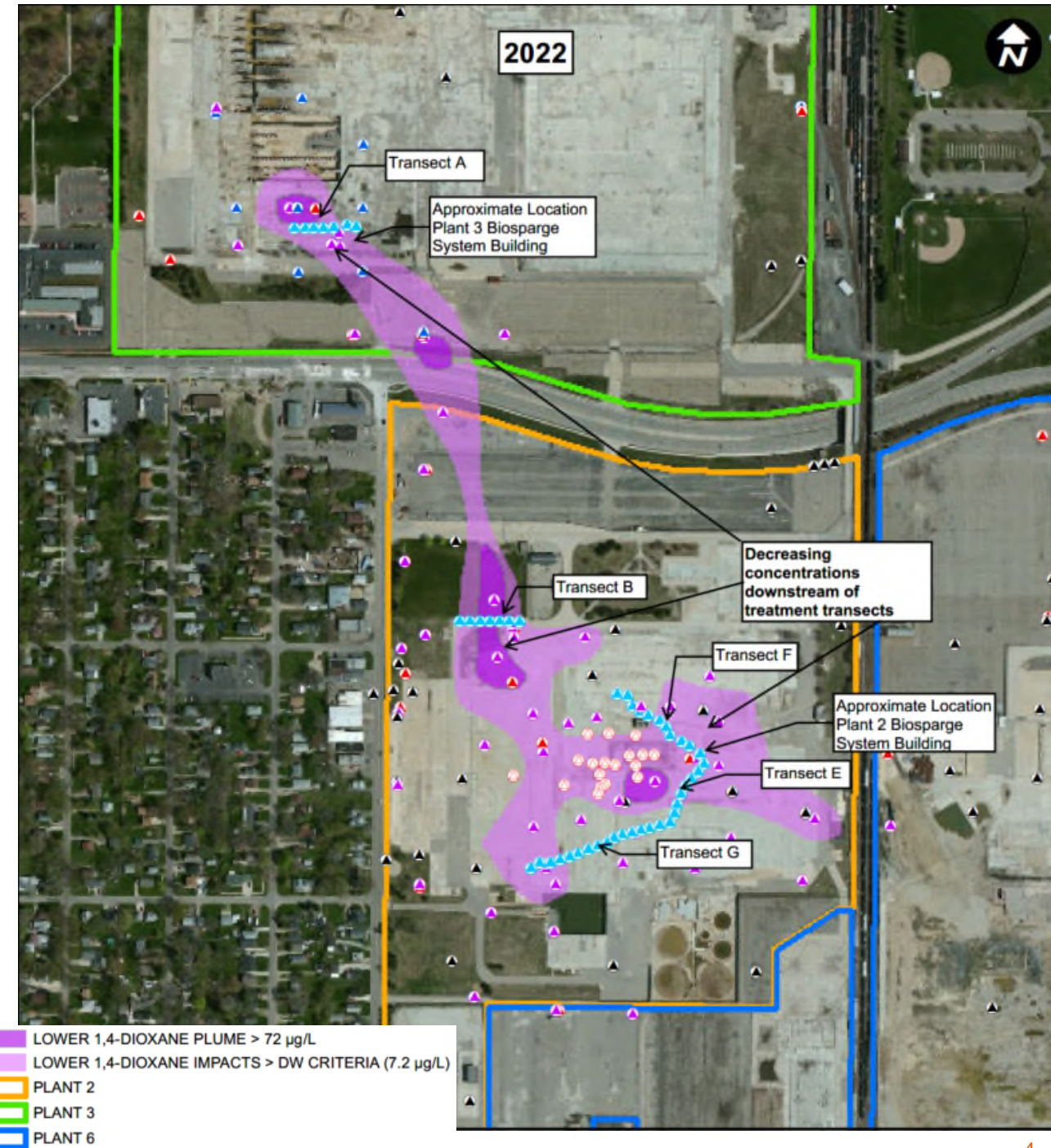
Remediation of 1,4-Dioxane in Weathered Bedrock

- Biosparge systems at Plant 2 and Plant 3 are fully operational
 - Minimal downtime at the Plant 3 system related to equipment repairs or regular system maintenance
- Results of performance monitoring show that the biosparge systems are achieving the short-term objective of reducing 1,4-dioxane concentrations and mass along the core of the weathered bedrock plume
- Next nutrient injection scheduled for Spring 2024.



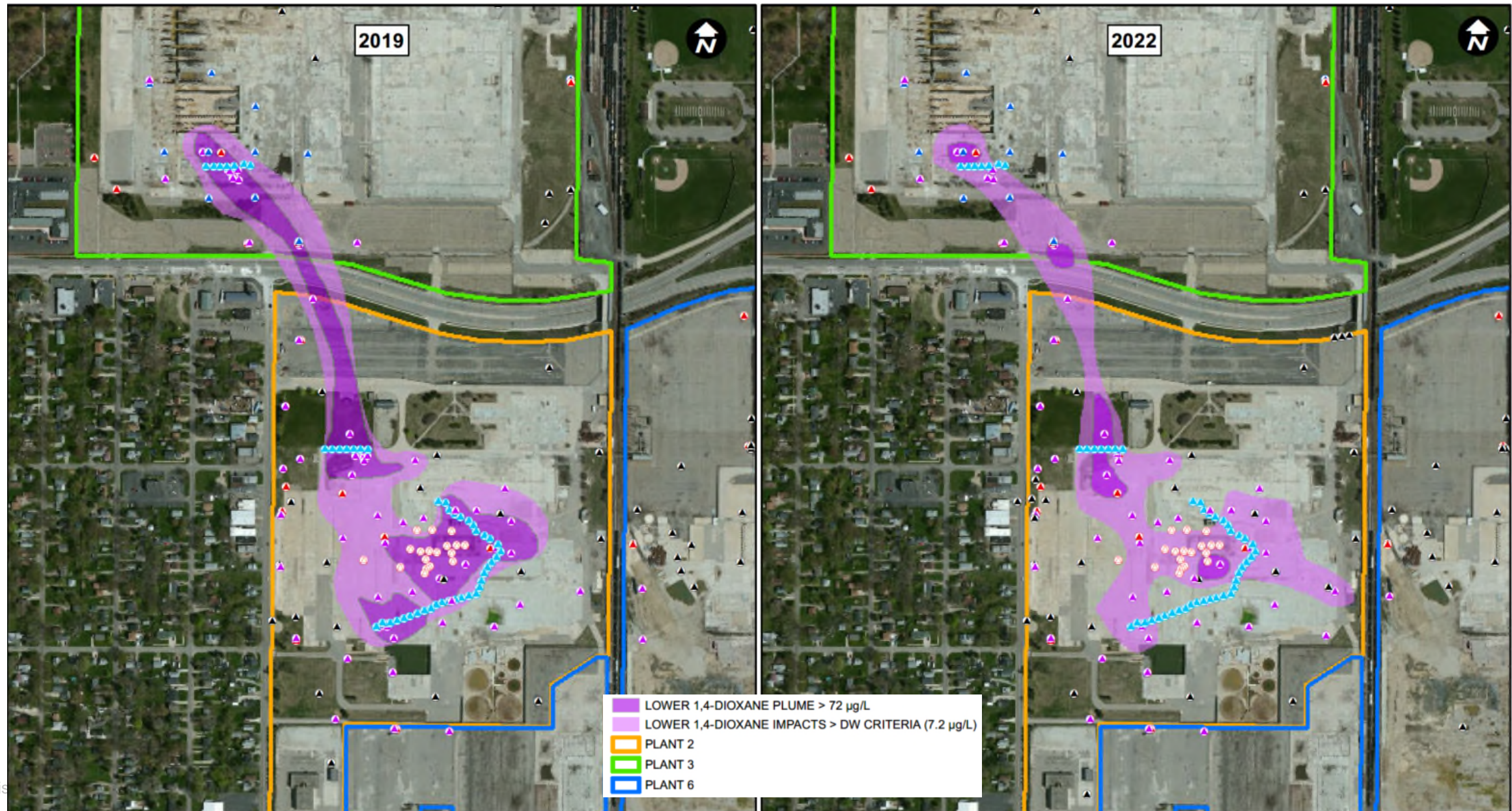
Remediation of 1,4-Dioxane in Weathered Bedrock

- The second full round of performance monitoring was conducted in Fourth Quarter 2023 to complete the semi-annual sampling schedule for 2023.
- Results from Fourth Quarter 2023 sampling continue to show stable to decreasing concentrations of 1,4-dioxane.
- A minor upward trend in one of the performance monitoring wells (TW-15-11) was detected; however, it is believed to be due to some short circuiting of the air being injected by the system due to damage sustained to a nearby well (TW-06-14). TW-06-14 is being evaluated for potential future abandonment.
- An annual Biosparge Summary Report summarizing the 2023-year data is anticipated to be submitted to EGLE during the First Quarter of 2024



Remediation of 1,4-Dioxane in Weathered Bedrock

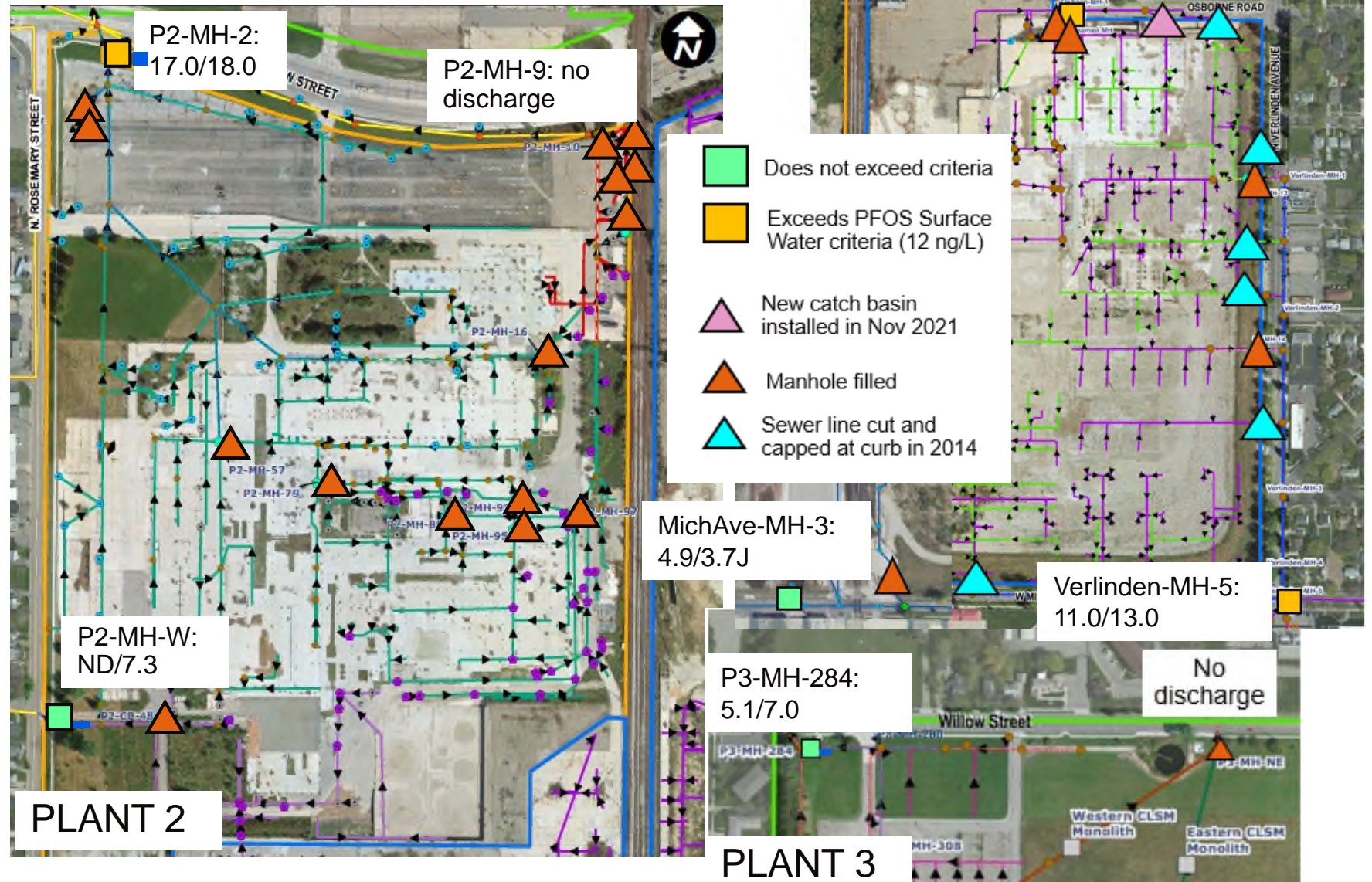
- Visual depiction of lower 1,4-dioxane plume (located within the deep overburden and weathered bedrock) distribution in 2019 vs. 2022



Monitoring of PFAS Impacts

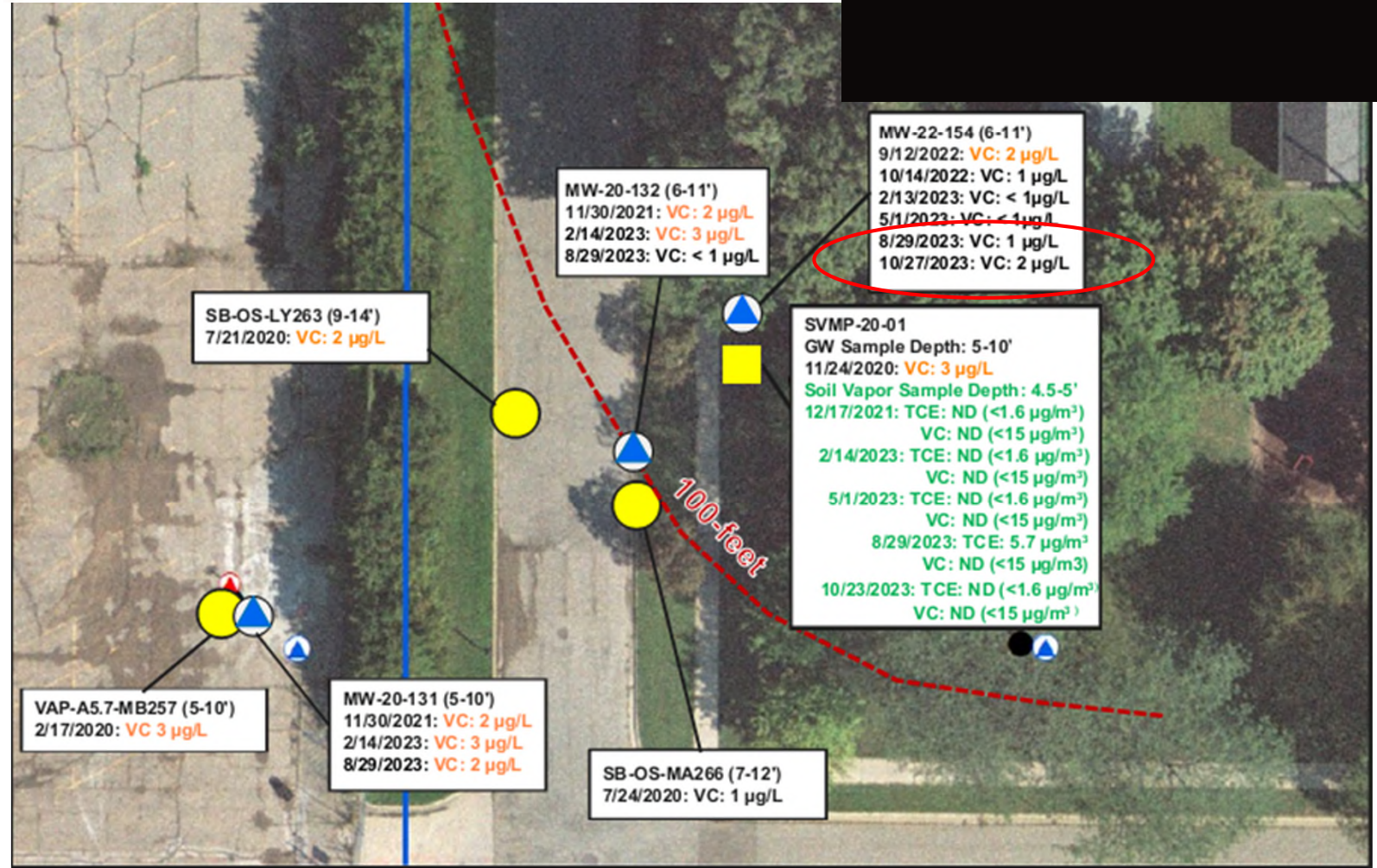
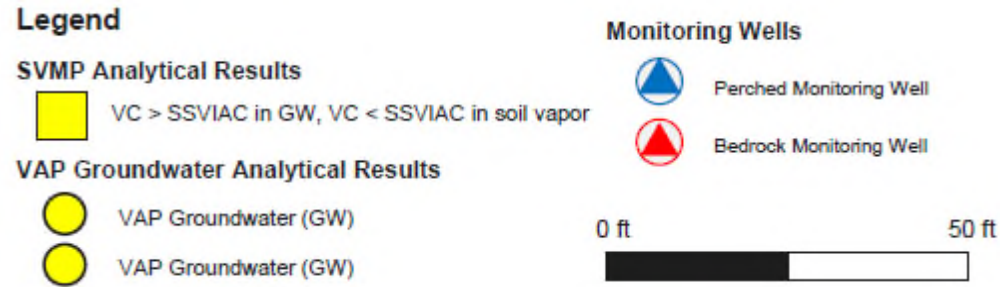
Sewer Monitoring

- Third Quarter and Fourth Quarter site wide monitoring of storm sewers was conducted in July and October of 2023, respectively. Results for Perfluorooctanesulfonic acid (PFOS – July/October data), the specific PFAS of concern, are depicted on figures to the right. Results are at or below the relevant criteria for all but one sample location at Plant 2 and two sample locations at Plant 6.
- First Quarter site wide monitoring of storm sewers is planned to be completed in February 2024. Results will be summarized in the First Quarter Progress Report.



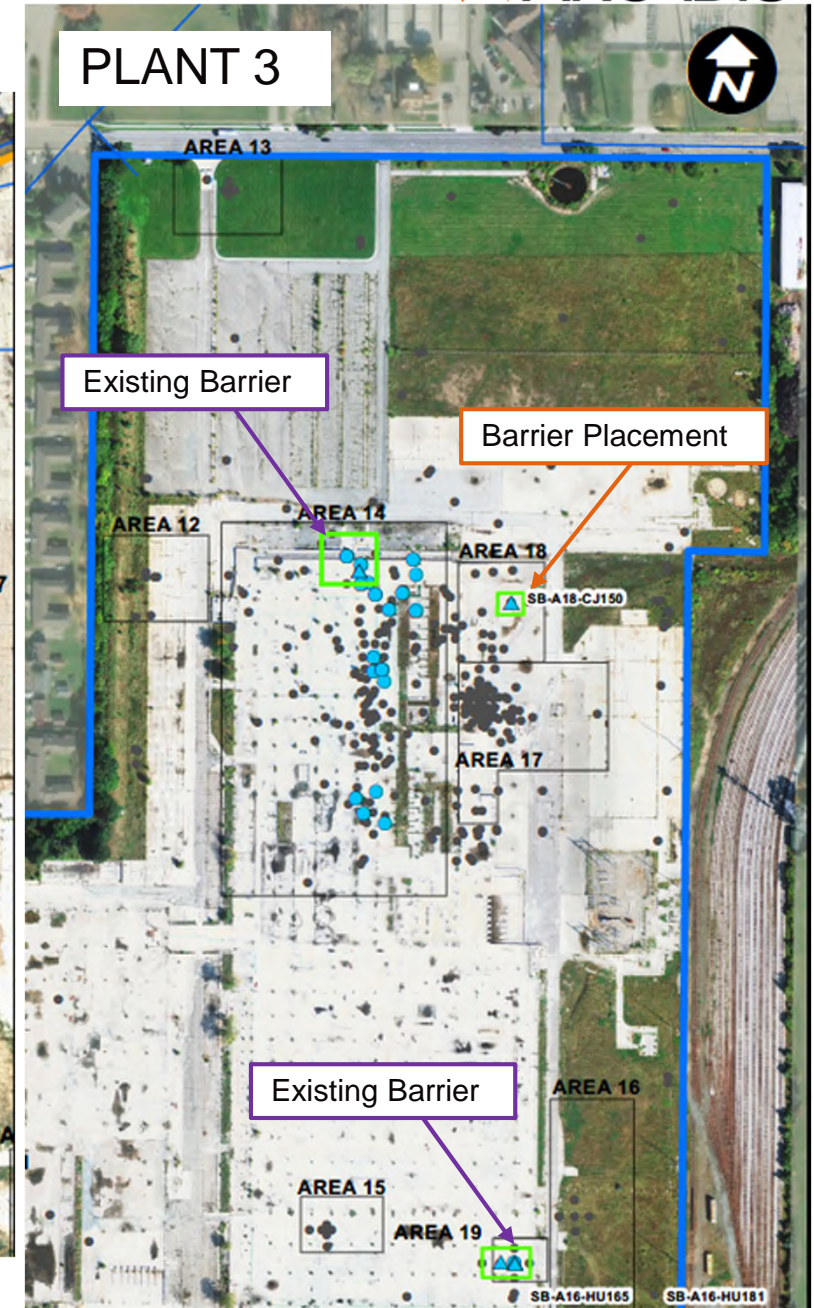
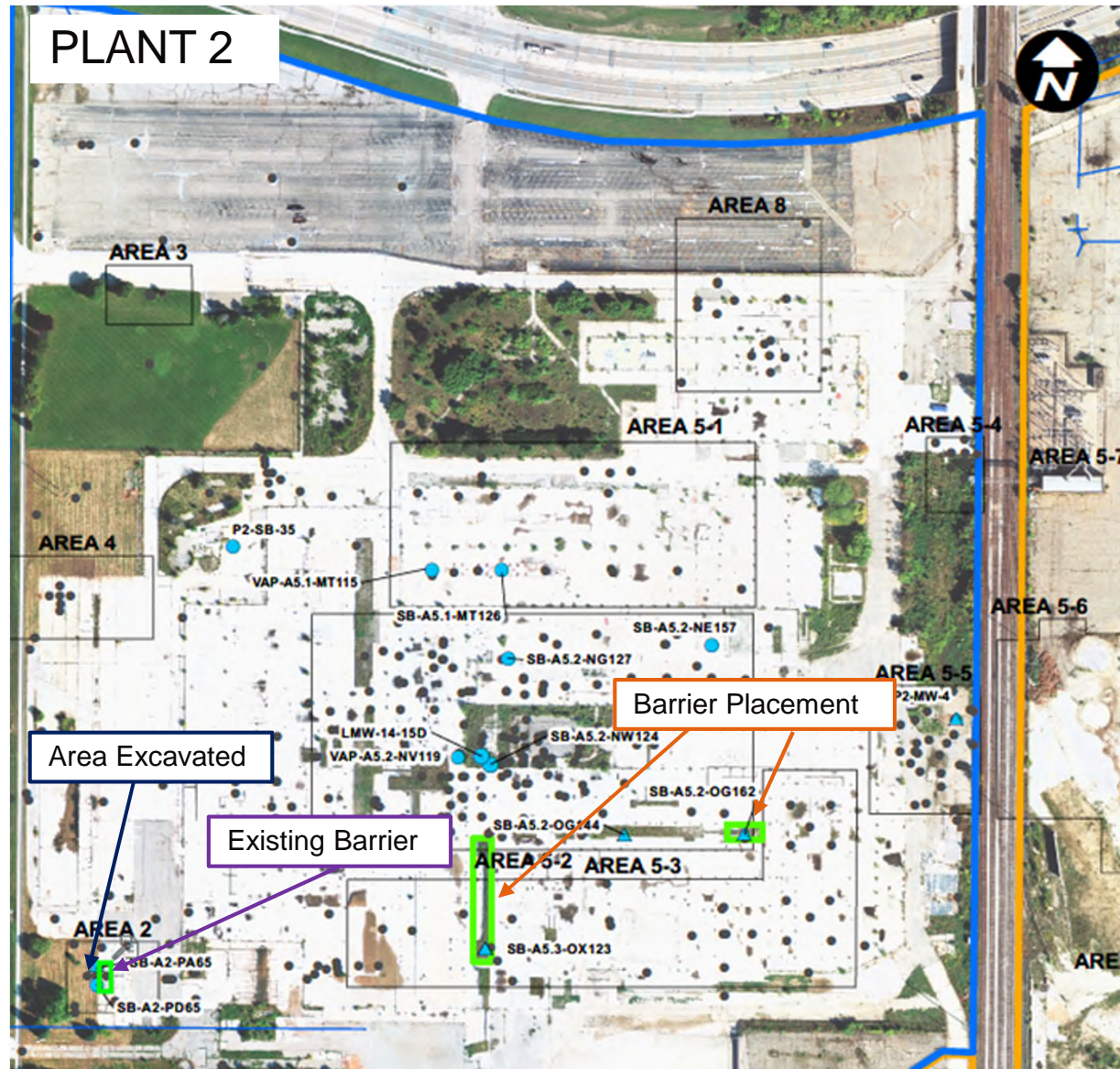
Plant 6 VI Evaluation Update

- Vinyl Chloride at MW-22-154 was 1 µg/L in August 2023 and 2 µg/L in October 2023
- Extent of chlorinated volatile organic compounds in groundwater currently defined
- TCE and VC not detected in soil gas at SVMP-20-01 sampled October 2023. TCE was detected in the prior sampling event in August 2023, but was below Residential and Nonresidential site-specific criteria.
- Monitoring will continue



Plant 2 Excavation and Plant 2/3 Exposure Barrier Placement Activities

- An excavation (within grass area) was conducted in Area 2-Plant 2 to remove arsenic impacted soils above EGLE Direct Contact
- Exposure barrier (geotextile fabric and gravel) placement in Areas 5-2 and 5-3-Plant 2 and Area 18-Plant 3 was completed
- Existing exposure barriers (concrete) are present in Areas 14 and 19 at Plant 3
- Activities approved by EGLE prior to initiation
- Work conducted from 12/11/23-12/14/23



Reports Submitted to EGLE Fourth Quarter 2023

- Plant 2 Toxic Substances Control Act (TSCA-PCBs) Soils Interim Measure Work Plan – Submitted on 10/11/23
- Plant 2 Area 2 Excavation and Plants 2 and 3 Exposure Barrier Placement Work Plan – Submitted on 11/7/23
- Reports can be viewed or downloaded from the RACER Website for the Lansing Property:
<https://www.racertrust.org/properties/lansing-plant-2-industrial-land>

Work in Progress and Near-Term Milestones Anticipated During the First Quarter of 2024



Activity	Schedule
Remediation of 1,4-Dioxane in the Weathered Bedrock	
Plants 2 and 3 Biosparge System Operation	Ongoing
Biosparge Shut Down Test	Upon EGLE Concurrence
Investigation of 1,4-Dioxane in Perched Zone	
Plant 2 1,4 Dioxane MW-14-58R Area Continued Evaluation and Groundwater Monitoring	February 2024
MW014-58R Area Investigation Summary Report	January 2024
Remediation and Investigation of PFAS	
Quarterly Storm Sewer Sampling	February 2024
Other investigations and Sampling	
Plants 2 Area 2 Excavation and Plants 2 and 3 Exposure Barrier Placement Summary Report	First Quarter 2024
First Quarter 2024 Groundwater Monitoring	February 2024
Monitoring Well Abandonment Memo	First Quarter 2024

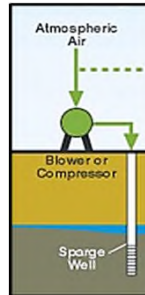
Appendix

BIOSPARGING TREATMENT OF 1,4-DIOXANE

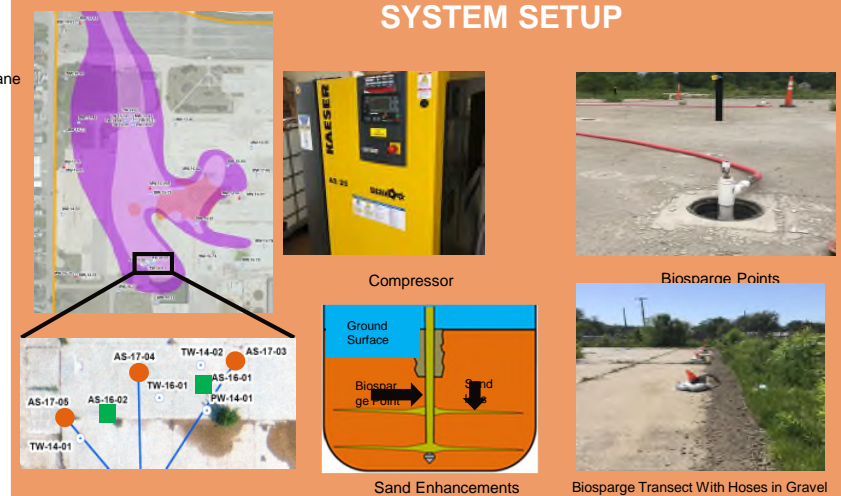
Lansing Industrial Land, Lansing and Lansing Township, Michigan

WHAT IS BIOSPARGING?

- Air and small amounts of propane are injected into the ground through wells
- Promotes biodegradation of chemicals in groundwater, much faster than it would occur naturally
- 1,4-dioxane is treated in the ground, so minimal waste is generated
- Nearby wells are sampled to make sure treatment is occurring



SYSTEM SETUP



- 2016 Pilot Test Biosparge Points
- 2018 Pre-Design Study Biosparge Points With Sand Enhancements
- Weathered Bedrock Monitoring Well

Plant 2 Biosparge Transect Layout



CONCLUSIONS

- Biosparging is a low cost, effective, safe and sustainable method for treating 1,4-dioxane
- Installation of sand enhancements improves treatment
- Continual monitoring of the treatment system improves results
- Technology can be scaled up to treat the rest of the site

FULL-SCALE DESIGN

- 5 transects with 48 air sparge wells across Plants 2 and 4
- Nearly 5 miles of air hose and an air/propane injection network
- Groundwater flows from northwest to southeast and is cleaned by each transect
- Tubing installed above grade to save on costs and to accommodate future development
- Network of monitoring wells to track treatment progress



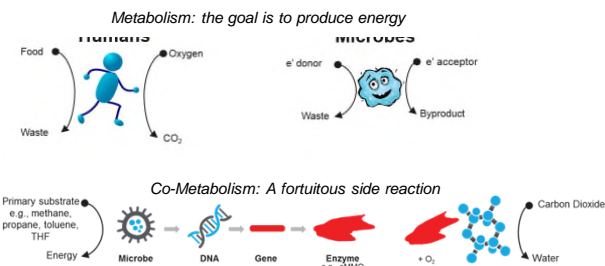
Plant 2 Biosparge Unit and Nutrient Injection Tanks



TREATMENT OBJECTIVES

- Reduce onsite concentrations of 1,4-dioxane in the top/weathered zone of the bedrock aquifer
- Prevent off-site migration of 1,4-dioxane

CO-METABOLIC BIODEGRADATION OF 1,4-DIOXANE:



Propane + Oxygen + Microbes = 1,4-Dioxane Treatment

