RACER TRUST
LANSING PLANTS 2, 3, & 6

2021 First Quarter Progress Report | April 15, 2021

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, interim remedial actions, and evaluation of remedial alternatives.

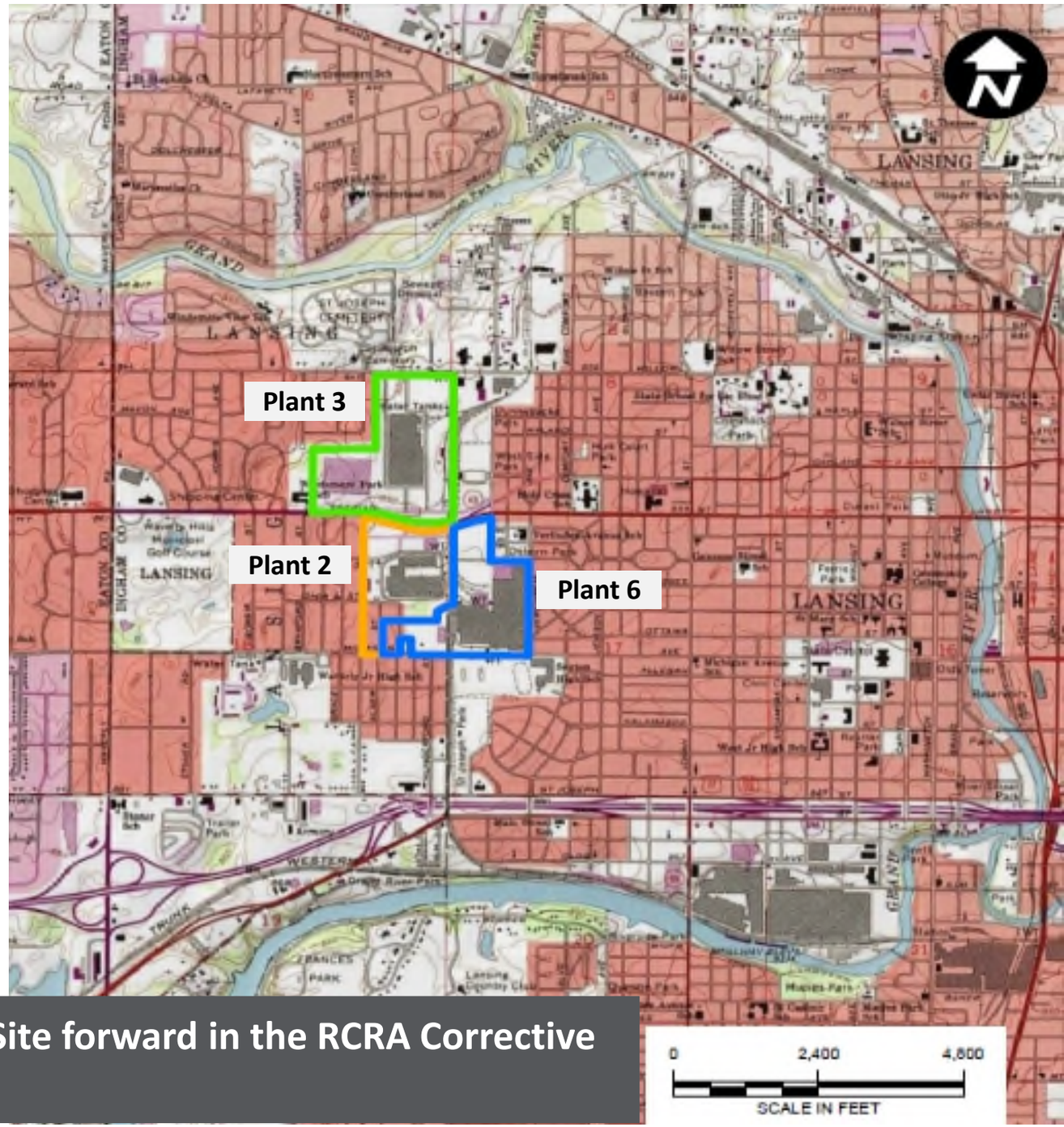
- There is currently no known exposure pathways for area residents associated with the site contaminants.

- 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 (Plant 2 system started operations during the third quarter of 2020). It is anticipated that portions of the Plant 2 biosparge system may need to operate for 10 to 15 years. See the appendix at the end of this report for more information on biosparging.

- Characterization of per and polyfluoroalkyl substances (PFAS) is ongoing to the north, east, and south of Plant 6. Interim actions for PFAS include storm sewer modifications on Plants 2, 3, and 6 to eliminate groundwater containing PFAS from infiltrating into and then discharging off-site through the storm sewers.

- Monitoring of potential soil vapor intrusion (VI) to indoor air is ongoing and will continue in the northeast portion of Plant 6 and the adjacent off-site area.

- Routine groundwater monitoring on Plants 2, 3, & 6 in the shallow (perched) zone, weathered bedrock, shallow bedrock, and deep bedrock is ongoing and is anticipated to continue for 25 to 30 years.



Activities completed during this period move the Site forward in the RCRA Corrective Action process

Notice of Migration (NOM) Considerations

As a result of PFAS groundwater cleanup criteria being updated in December 2020, RACER began working with EGLE to provide notices of migration resulting from the presence of PFAS in groundwater north and east of Plant 6

- Up to 18 commercial and residential property owners will likely be provided a notice (based on current available data)
- RACER expects to provide the following to property owners:
  - Cover Letter – why they are receiving the notice
  - Local Map – zoomed in, parcel ID, surrounding streets, surrounding data
  - PFAS Fact Sheet
- Notices likely to start being sent to affected property owners starting in April

Remediation of 1,4-Dioxane in Weathered Bedrock

- Biosparge systems at Plant 2 and Plant 3 are fully operational
  - Plant 2 - 97% uptime since start up in August 2020
  - Plant 3 - 95% uptime since compressor upgrade in July 2020
  - Downtime related to either equipment upgrades/replacement or weather-related power outages
- 2020 Fourth Quarter performance monitoring was conducted in December 2020
- Results from this event were presented in the Lower 1,4-Dioxane Biosparge Update Report, submitted to EGLE on March 18, 2021 and available on RACER's Webpage for Lansing Plant 2
- Results show that the biosparge systems are achieving the short-term objective of reducing 1,4-dioxane concentrations along the core of the weathered bedrock plume

Remediation of PFAS Impacts

Sewer Modifications and Performance Sampling

- Follow-up performance monitoring was completed at four manhole locations at Plant 2 in February 2021 - the purpose of this follow-up sampling was to verify elevated results from the December 2020 sampling event
- Post construction/modification storm sewer inspections were completed at each Plant in March 2021 following a period of significant snow melt - the purpose of these inspections is to evaluate the Plants for ponding and the potential for storm water runoff onto neighboring properties
- Results from these events, along with the results from the 2020 Fourth Quarter site wide performance monitoring event, were presented in the Plant 2, 3, & 6 Sewer Modification Completion Report, submitted to EGLE on March 25, 2021 and available on RACER's Webpage for Lansing Plant 2
- Select manholes were also sampled in March 2021 as part of quarterly performance monitoring for storm sewers and results will be reported in an upcoming storm sewer report to EGLE

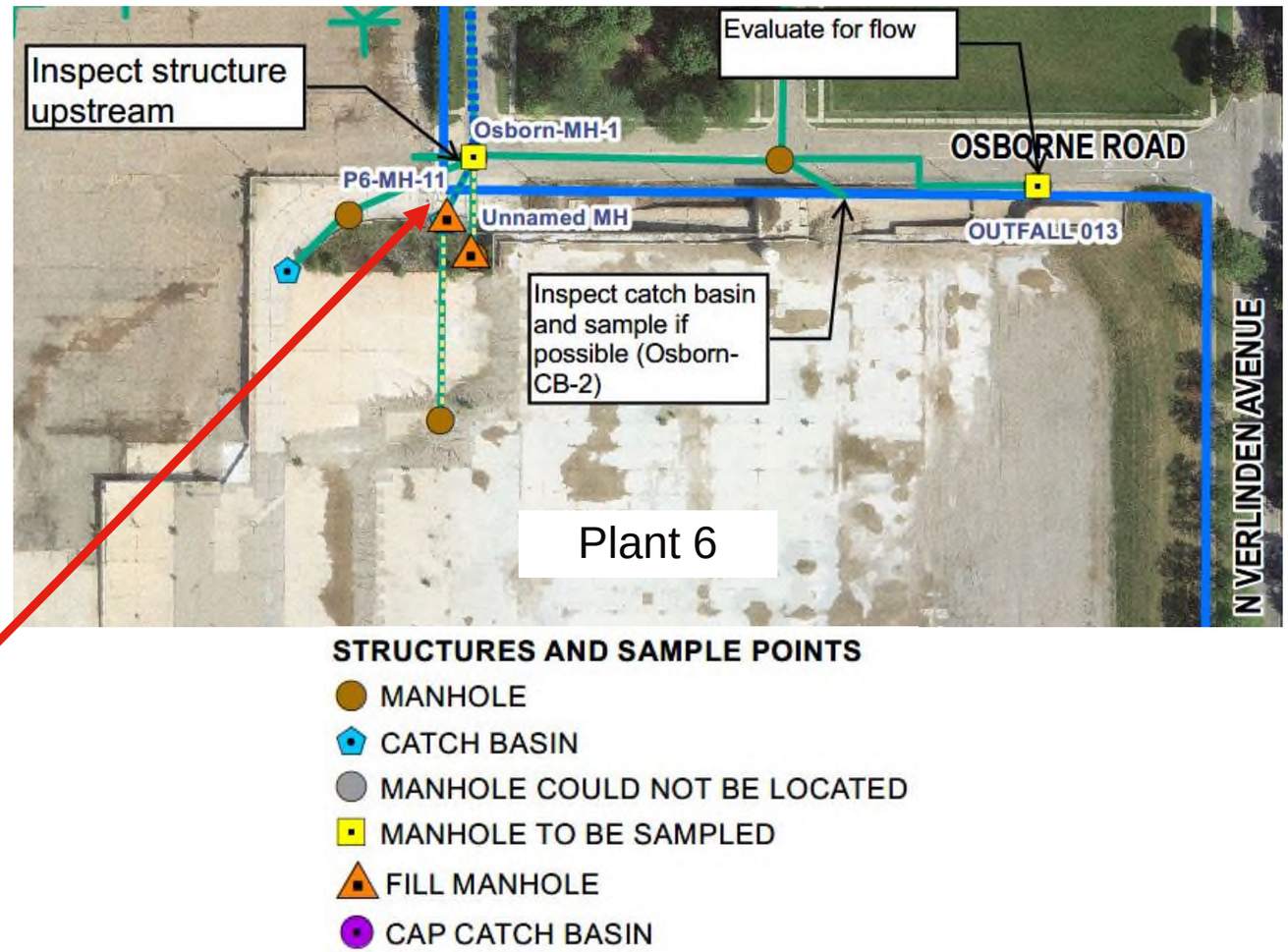
Remediation of PFAS Impacts

2021 First Quarter Plants 2, 3, & 6 Storm Sewer Performance Monitoring Sampling Event

Sampling event completed March 2021:

- Plant 2: Collected samples from 3 storm sewer manholes and inspected all sanitary and storm sewer outfalls across the Site
- Plant 3: Collected samples from 2 storm sewer manholes and inspected all sanitary and storm sewer outfalls across the Site
- Plant 6: Collected samples from 13 storm sewer manholes and inspected catch basins upstream of the structure located near the Plant 6 entrance off Osborn (Osborn-MH-1)

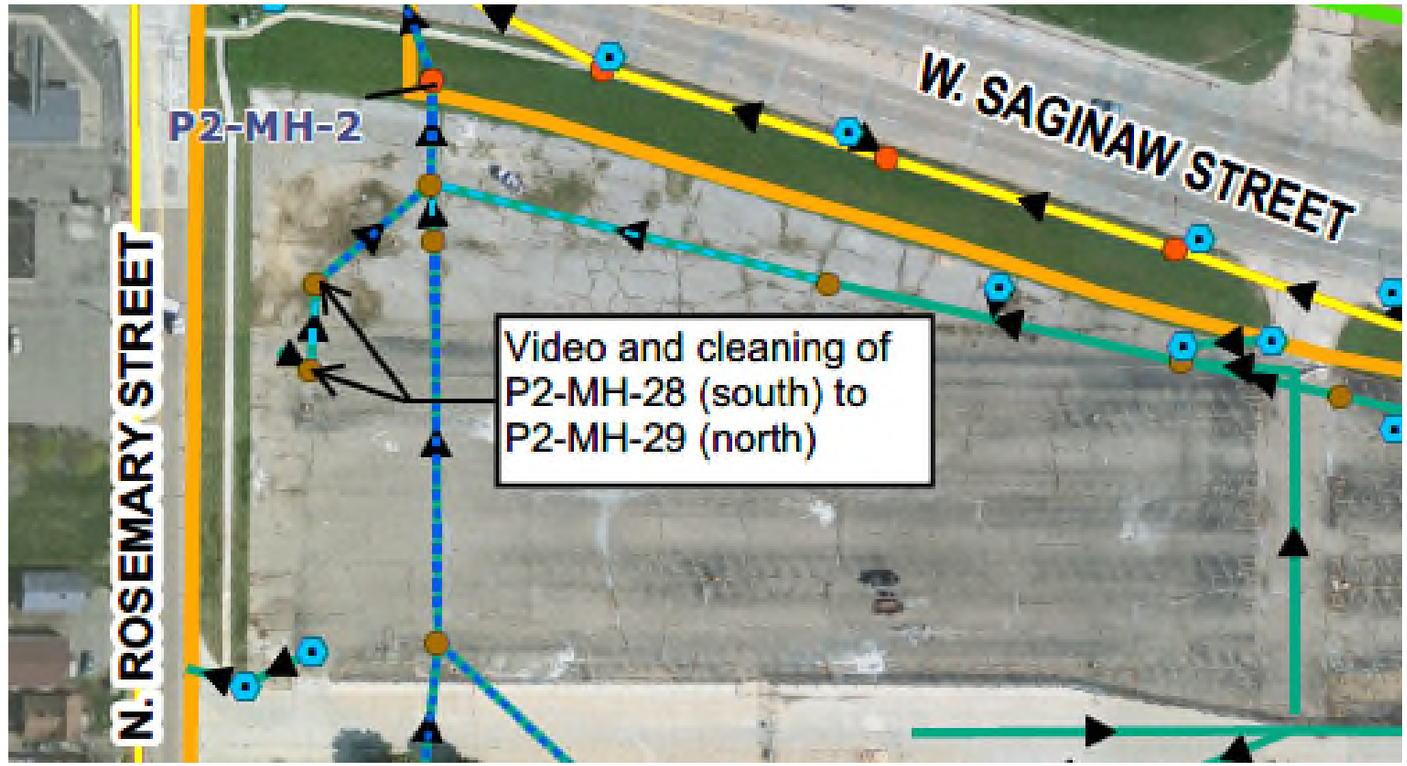
Results from this event will be presented in a separate report and summarized in the 2021 Second Quarter Progress Report



Remediation of PFAS Impacts

Plant 2 Storm Sewer Video Inspection

- In March, a section of storm sewer at northwest corner of Plant 2 was inspected to determine if groundwater was entering the storm sewer system
- Observations from this inspection will be summarized in a separate report and in the 2021 Second Quarter Progress Report



STRUCTURES & SAMPLE POINTS
- MANHOLE
- OFFSITE MANHOLE
- FILLED STRUCTURE
- CAPPED STRUCTURE
- CATCH BASIN REMAINING OPEN
- COULD NOT LOCATE STRUCTURE

OBSERVED FLOW (DECEMBER 2020)
- NO FLOW
- TRICKLE (~1 GPM OR LESS)
- LITTLE (~1-3 GPM)

PLANT 2 DRAINAGE NETWORKS
- NORTHEAST (PARTIALLY ABANDONED
- CENTRAL (PARTIALLY ABANDONED)
- SOUTHWEST (ABANDONED)
- STORM LINE
- OFFSITE STORM LINE

Remediation of PFAS Impacts

Storm Water Inspection Results

- No off-site overland stormwater discharges observed beyond baseline conditions, and none from areas of ponding
- Ponding observed in Plant 3 southern parking lot, northern and eastern Plant 3, southern Plant 2, and northern Plant 6 after large rain events
- Ponding areas are internal to Site and/or separated from property boundary by elevation rise
- Ponding dissipates relatively quickly
- Baseline conditions: Offsite runoff at Willow Street, Michigan Avenue, and Osborne Street gates (rainwater)

Offsite runoff (pre-2018)

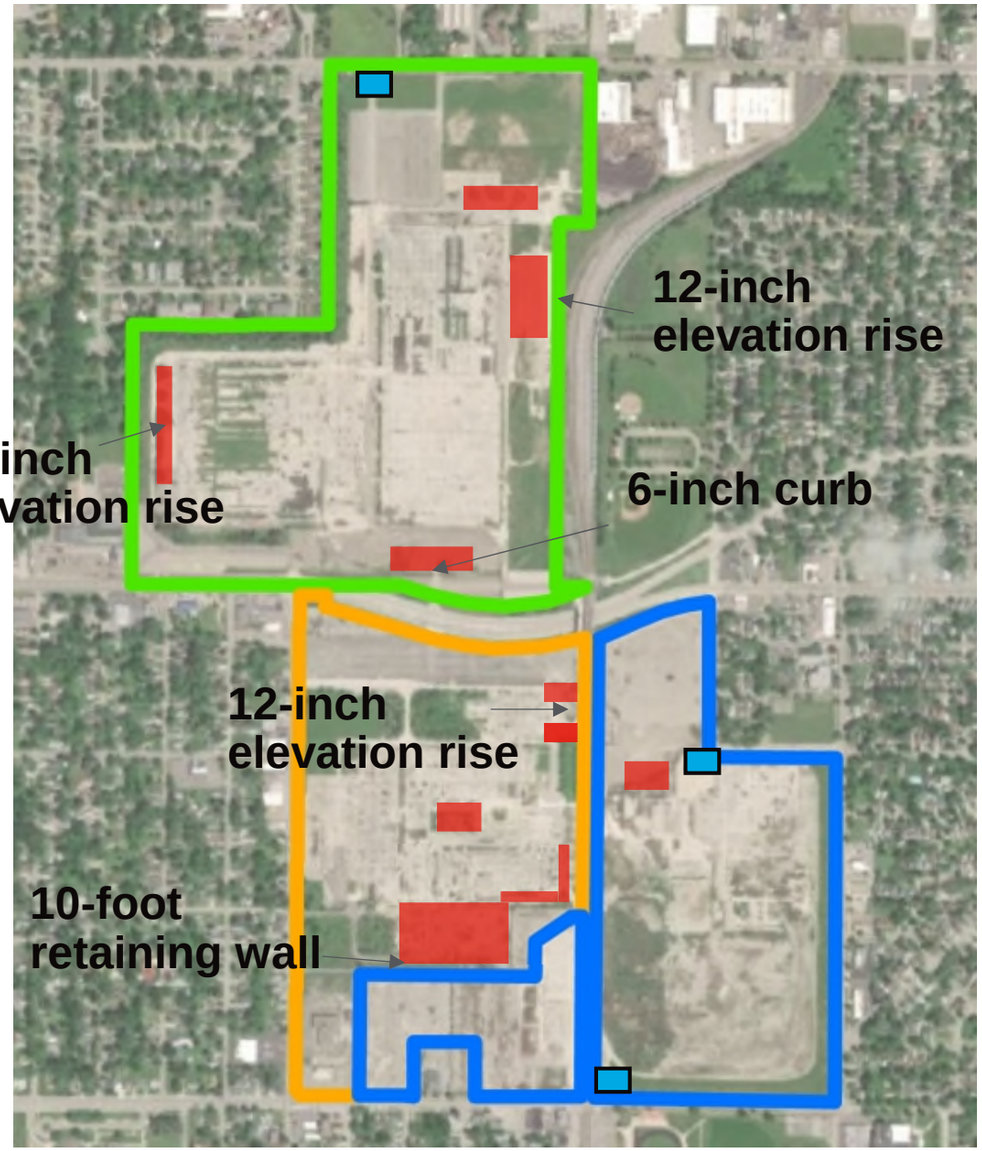
Area of ponding (post modifications)

PLANT BOUNDARIES

PLANT 2

PLANT 3

PLANT 6



PFAS Investigation

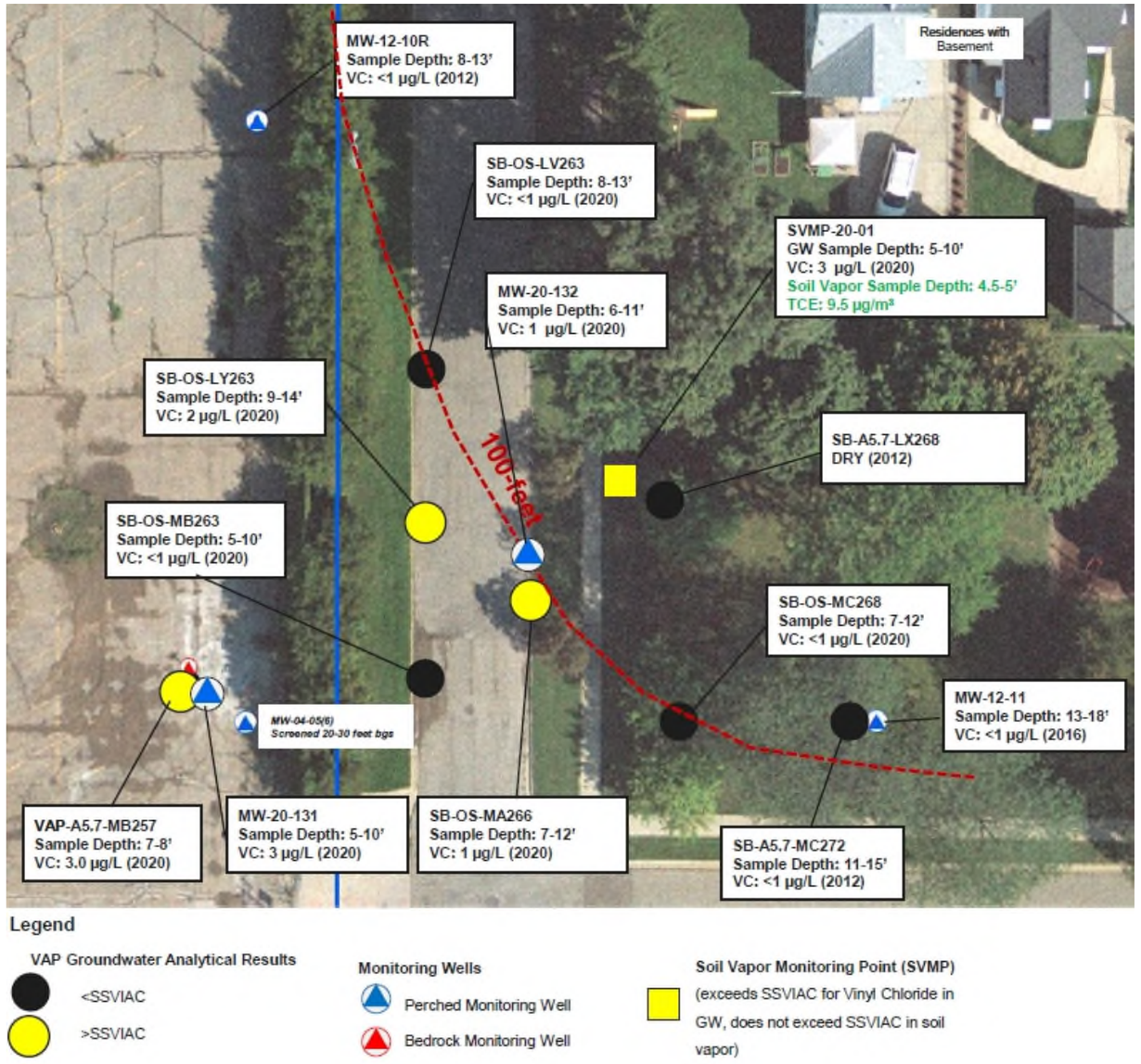
Plant 6 Off-Site Well Installation

- Work completed in March 2021
- Objective of new wells is to delineate PFOS and PFOA at the southern boundary and to facilitate groundwater monitoring
- Installed three on-site monitoring wells on Plant 6 along the eastern property boundary to facilitate monitoring of PFOS and PFOA identified in previous investigations
- Installed three off-site monitoring wells within the southern right of way of Michigan Avenue to provide delineation of impacts identified along the southern boundary of Plant 6
- These new wells were sampled as part of the 2021 First Quarter sampling event
- The results will be included in the semi-annual report, following completion of the 2021 second quarter sampling event, and a summary will be provided in the 2021 Second Quarter Progress Report

Soil Vapor Investigation

Plant 6 Vapor Intrusion Summary

- Monitoring Wells MW-20-131 and 20-132 resampled on 2/26/21
  - Both with vinyl chloride at 3 µg/L
  - Recommend continued monitoring
- Soil Vapor Monitoring Point SVMP-20-01 was water-logged during the 2021 first quarter sampling event so no soil vapor sample could be collected
  - Remained water-logged in March, will try again in June during 2021 second quarter groundwater sampling event
- Summary report submitted to EGLE on 2/8/21 and available on RACER's Webpage for Lansing Plant 2



2021 First Quarter Groundwater Monitoring

- Completed 2021 First Quarter groundwater monitoring in accordance with the October 2019 revised Interim Groundwater Monitoring Program (IGMP) approved by EGLE
- First quarter event was completed in March 2021
- Sampled a total of 88 wells for one or more of the following constituents of concern (COCs); per- and polyfluoroalkyl substance (PFAS), semi volatile organic compounds (SVOCs), volatile organic compounds (VOCs) and 1,4-dioxane. This included:
  - 18 wells sampled and analyzed for PFAS
  - 29 wells sampled as part of the biosparge performance monitoring
  - Groundwater elevations were collected from a total of 86 wells
  - Results will be included in the 2021 Semi-Annual Groundwater Monitoring Report, which is expected to be submitted in the Fourth Quarter of 2021

Work in Progress and Near-Term Milestones Anticipated During the Second Quarter of 2021

Activity	Schedule
Remediation of 1,4-Dioxane in the Weathered Bedrock	
Plants 2 and 3 Biosparge System Operation	Ongoing
Remediation and Investigation of PFAS	
Plant 6 groundwater investigation scope of work submittal	April 2021
Plant 6 off-site groundwater investigation scope of work implementation	May/June 2021
Plants 2 and 6 Storm Sewer Modifications implementation	April/May 2021
Quarterly Storm Sewer Sampling	June 2021
Other investigations and Sampling	
Plant 2 TSCA (PCB) soils IM work plan submittal	April 2021
Plant 2 PCB Vault closure scope of work submittal	April 2021
Plant 2 and 3 Soils Corrective Measure Work Plan implementation	April 2021
Notice of Migration submittal(s)	April 2021
2020 Groundwater Monitoring Annual Report submittal	April 2021
Second Quarter 2021 Groundwater Monitoring	June 2021

ARCADIS Design & Consultancy for natural and built assets

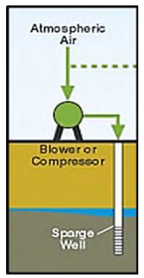
Appendix

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



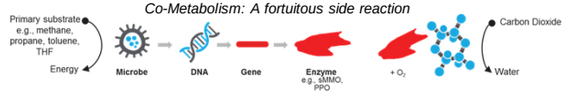
TREATMENT OBJECTIVES

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

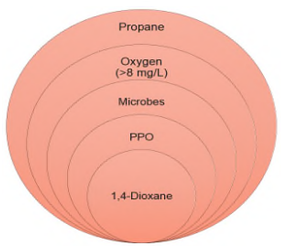
CO-METABOLIC BIODEGRADATION OF 1,4-DIOXANE:

Metabolism: the goal is to produce energy

Co-Metabolism: A fortuitous side reaction



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

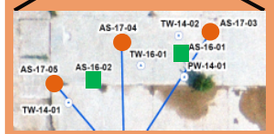


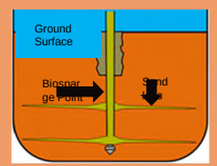
SYSTEM SETUP

Propane

Compressor

Biosparge Points



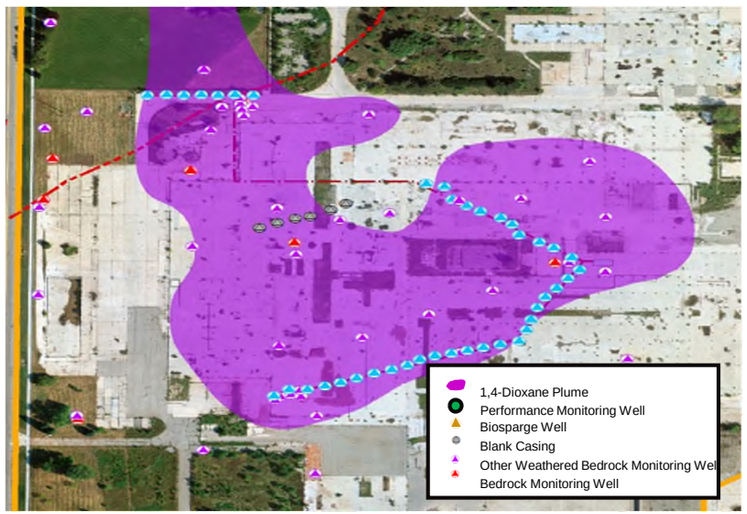


Sand Enhancements

Biosparge Transect With Hoses in Gravel Cover

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