EPA & DEQ
Town Hall Meeting
Wolverine Update

North Kent County

March 26, 2019

Rockford High School Auditorium

Meeting Agenda

Introductions and Update

Presentations

- DEQ – PFAS Results
- EPA – Investigation Results
- DEQ & EPA – Next Steps
- EPA – Public Outreach

Questions & Answers

North Kent County PFAS Exposure Assessment

Purpose:

Measure amounts of PFAS in the blood of a group of people from North Kent County who have PFAS in their private drinking water wells

MDHHS is recruiting participants through spring 2019

Over 300 people have participated; the goal is 800

If you receive a letter or call from MDHHS inviting your household to participate, please call MDHHS to respond.

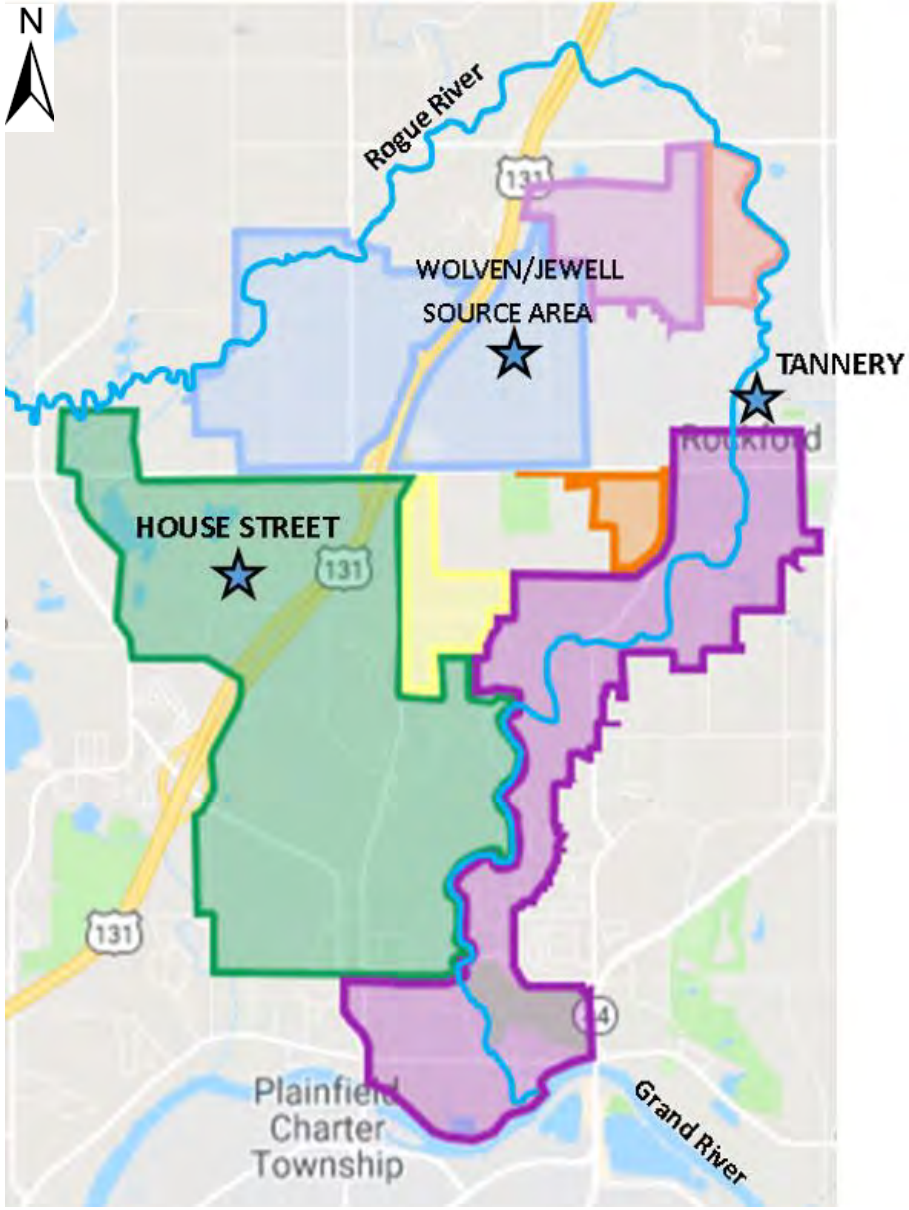
What has the DEQ done since the November 2017 Town Hall?

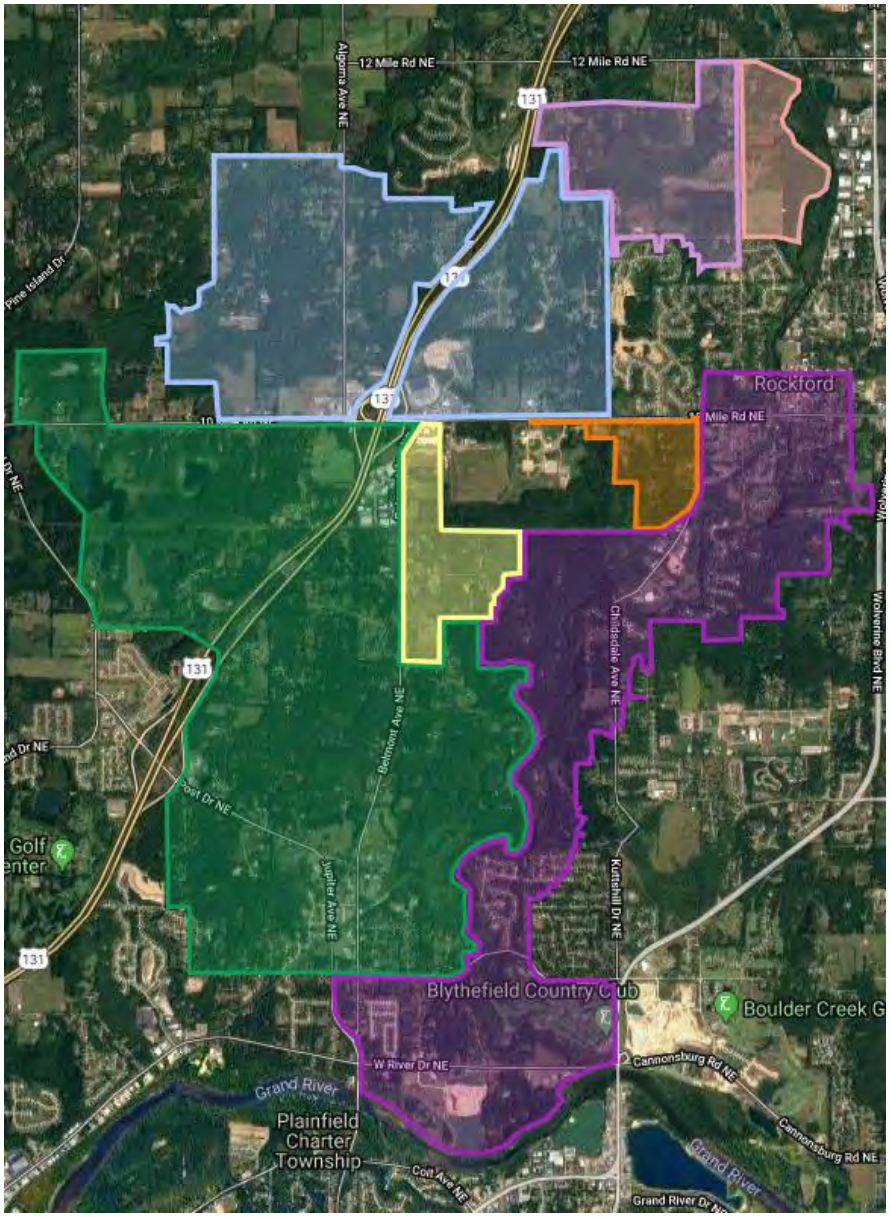
- DEQ and health agencies attended approximately 27 small neighborhood meetings
- Overseen the sampling of over 1700 private water wells, filter performance oversight, and continued coordination with local and state health agencies
- Responded to thousands of phone calls and emails from the community
- Investigation of over 110 alleged dumping sites from the community (24 of those sites referred to Wolverine for follow-up)
- Reviewing and overseeing Wolverine's response actions and report submittals (field and technical data reviews)
- Directing and implementing a DEQ hydrogeologic investigation

DEQ Agenda

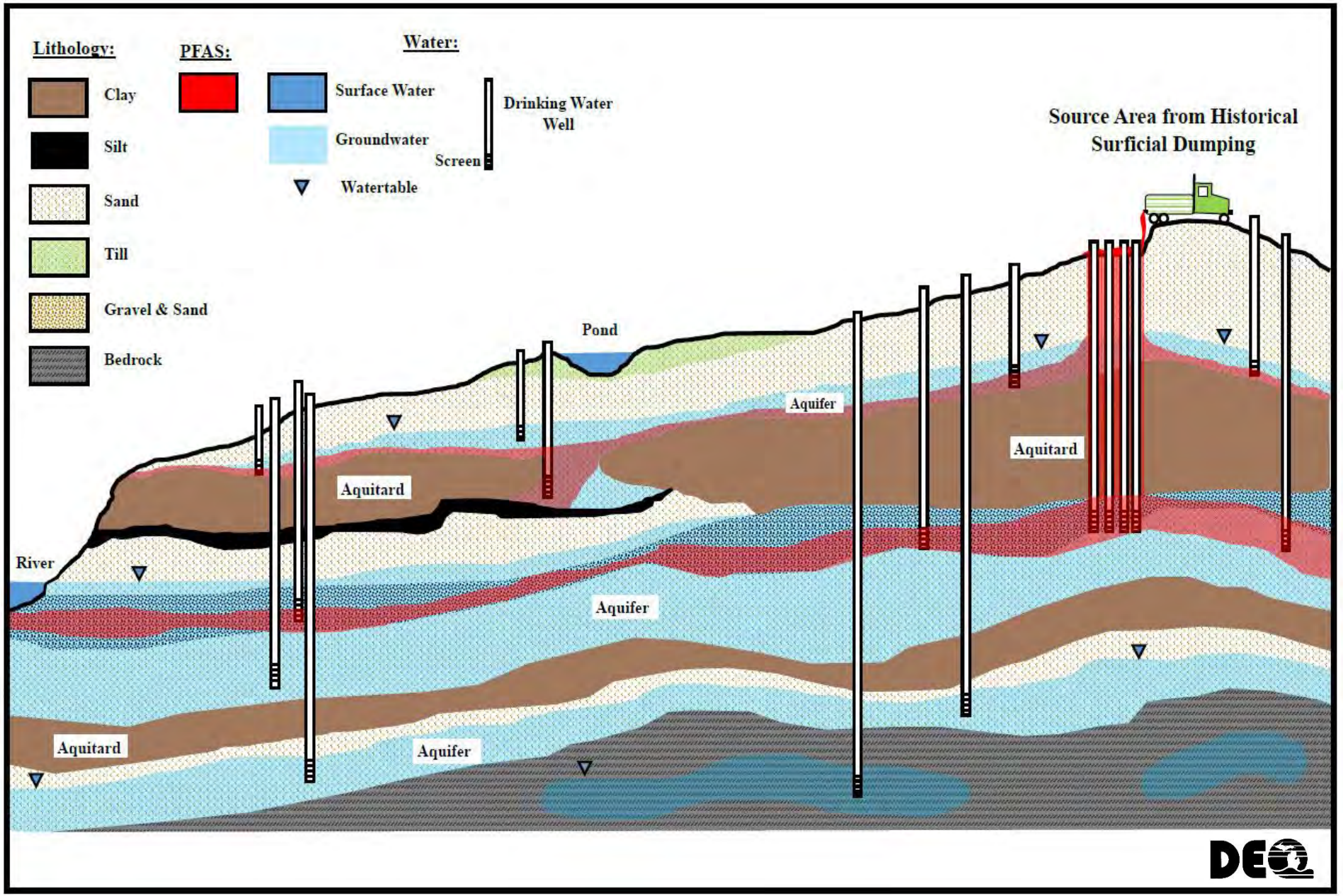
- Site Map Overview of Investigation Areas
- Basic Geology Concepts
- Residential Well PFAS Results
- Tannery PFAS Results
- House Street History & PFAS Results
- Wolven/Jewell History & PFAS Results
- DEQ Hydrogeologic Investigation
- Continued Work

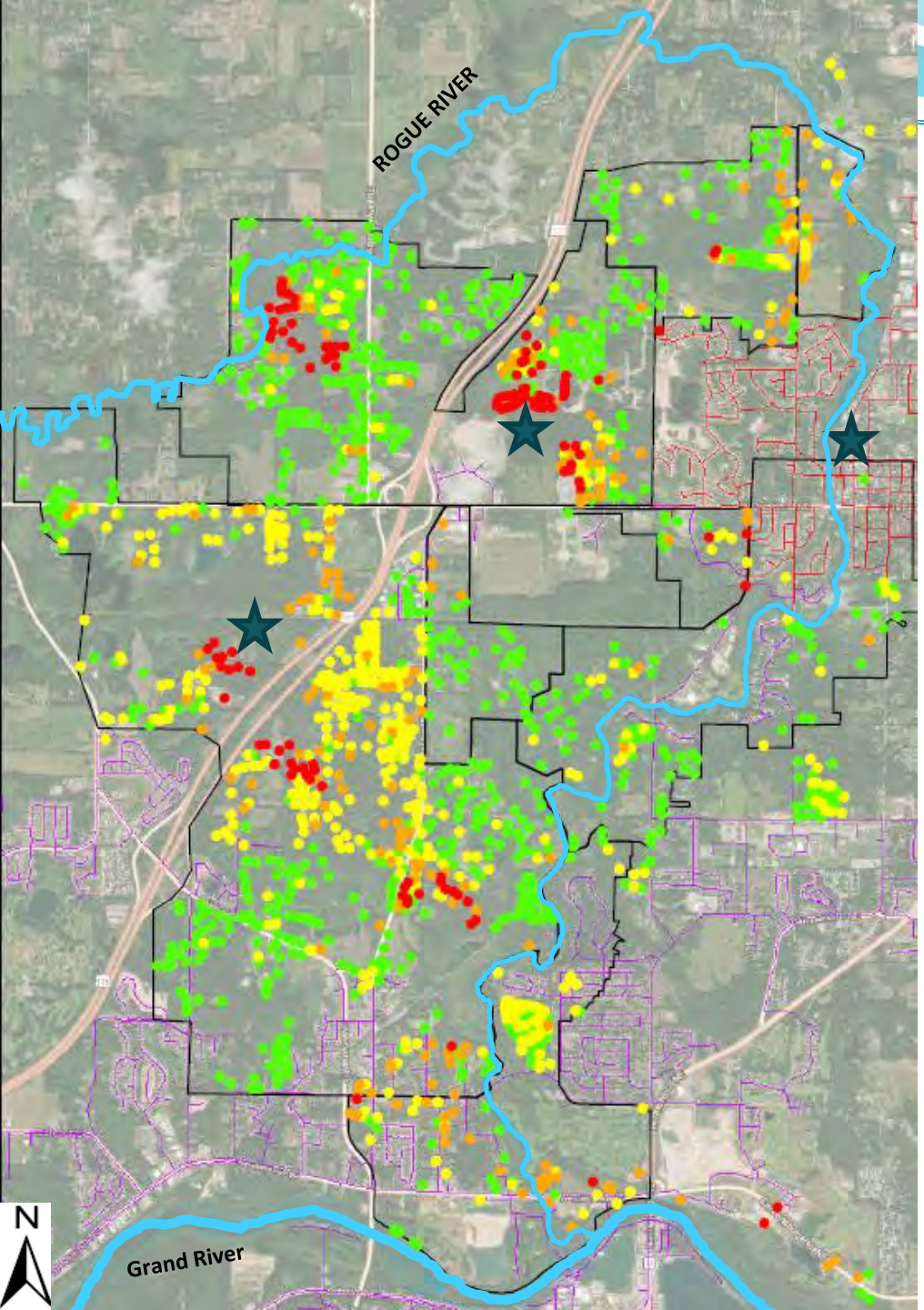
Site Investigation Overview





Basic Geology Concepts





Water Well Results

1708 wells sampled

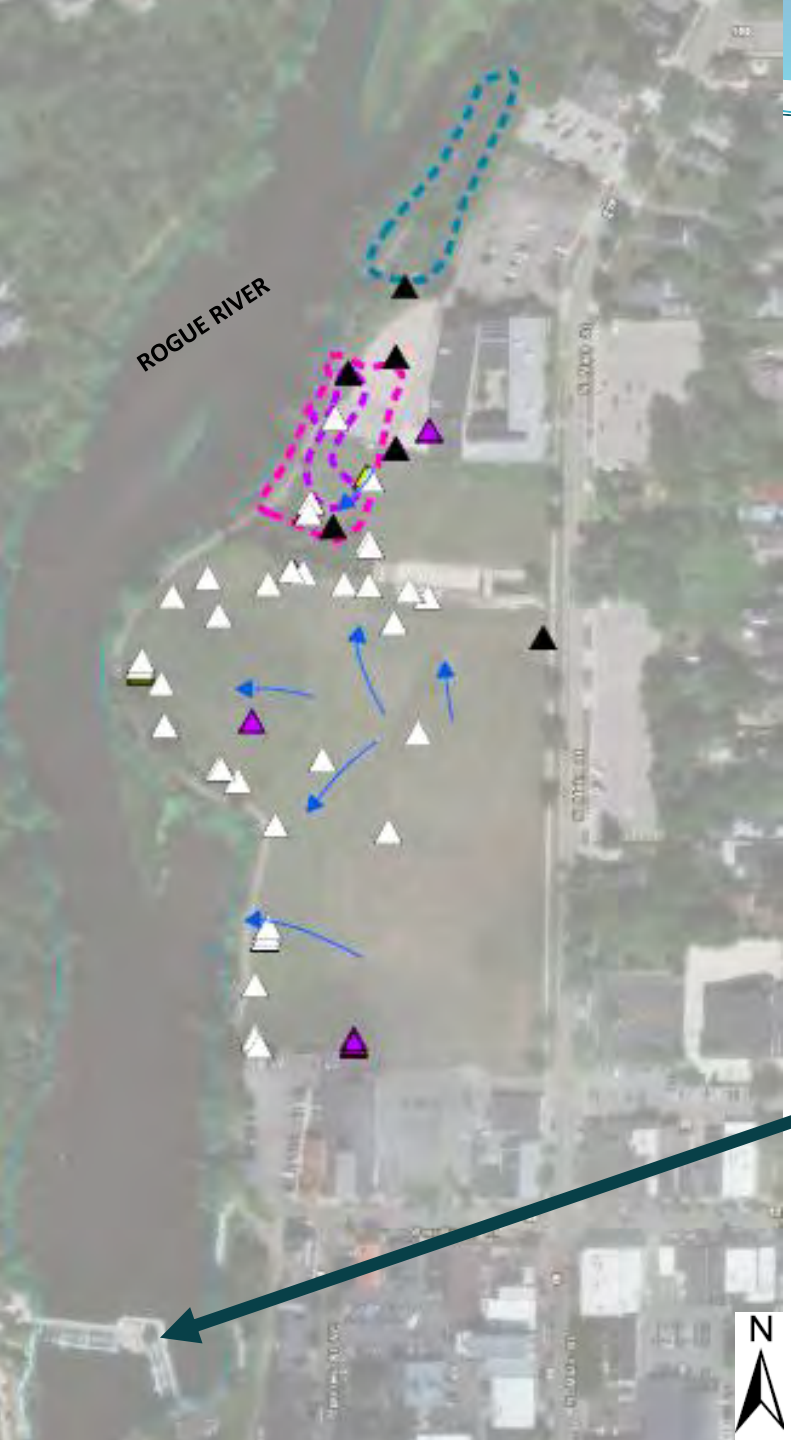
PFOS + PFOA, ppt

- Non-Detect (923)
- >0 to 10 (457)
- >10 to 70 (204)
- > 70 (124)

FILTERS (maintained by Wolverine)

- **537 Whole-House Filters**
- **234 Point-of-Use Filters**

Wolverine Tannery – Groundwater PFAS Results



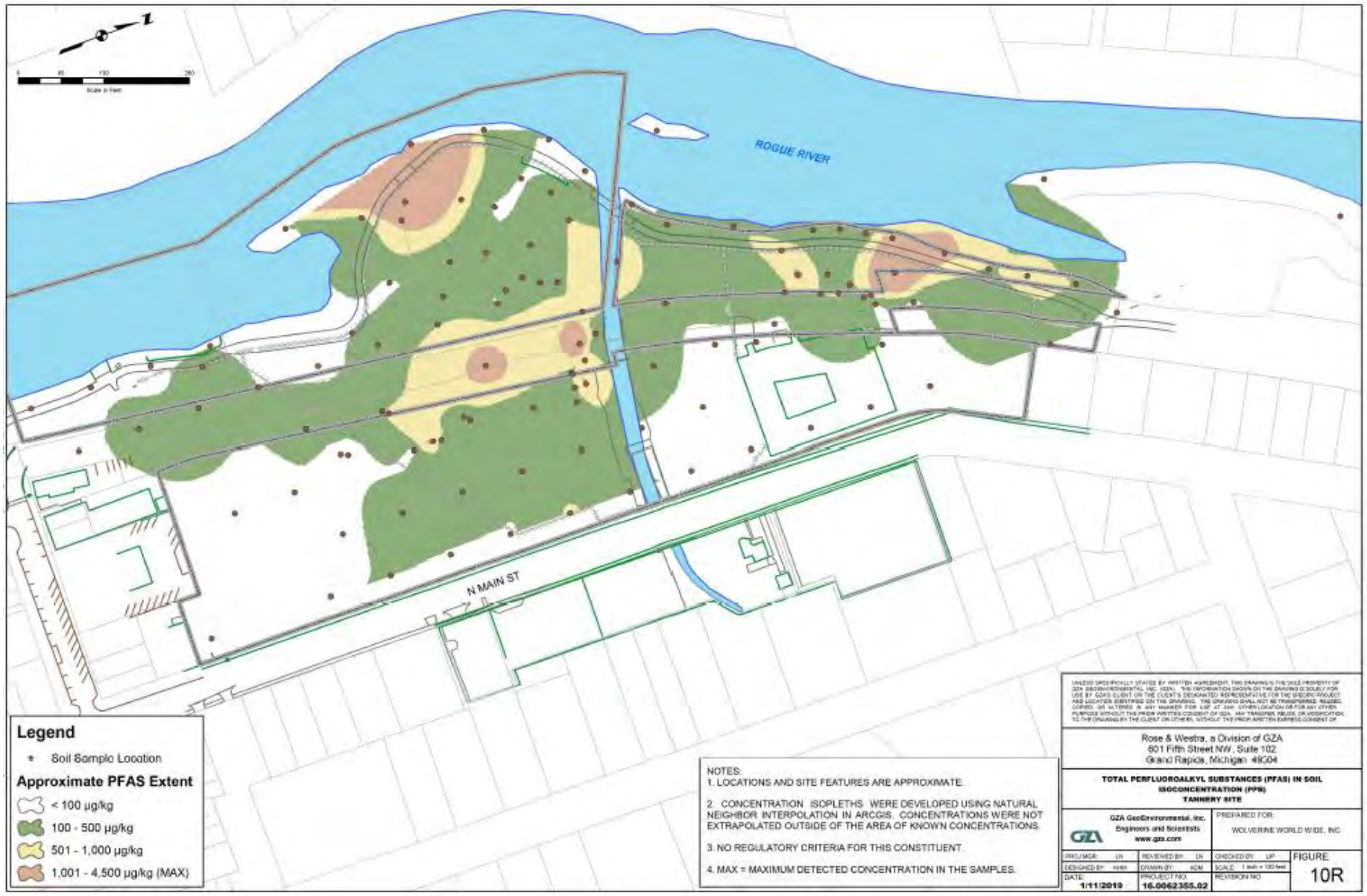
Groundwater Sample Location
PFOS + PFOA, ppt

- Non-Detect
- >0 to 10
- >10 to 70
- >70 to 1,000
- >1,000 to 5,000
- >5,000 to 10,000
- >10,000 to 670,0000

- Approx. Horizontal Extents of Hides & Leather Scrap
- Approx. Horizontal Extents of Leather Scrap
- Approx. Horizontal Extents of Leather Scrap Dispersed in Fill
- Groundwater Flow Direction

Rockford Dam near former Tannery

Wolverine Tannery – Soil PFAS Results



House Street Area History

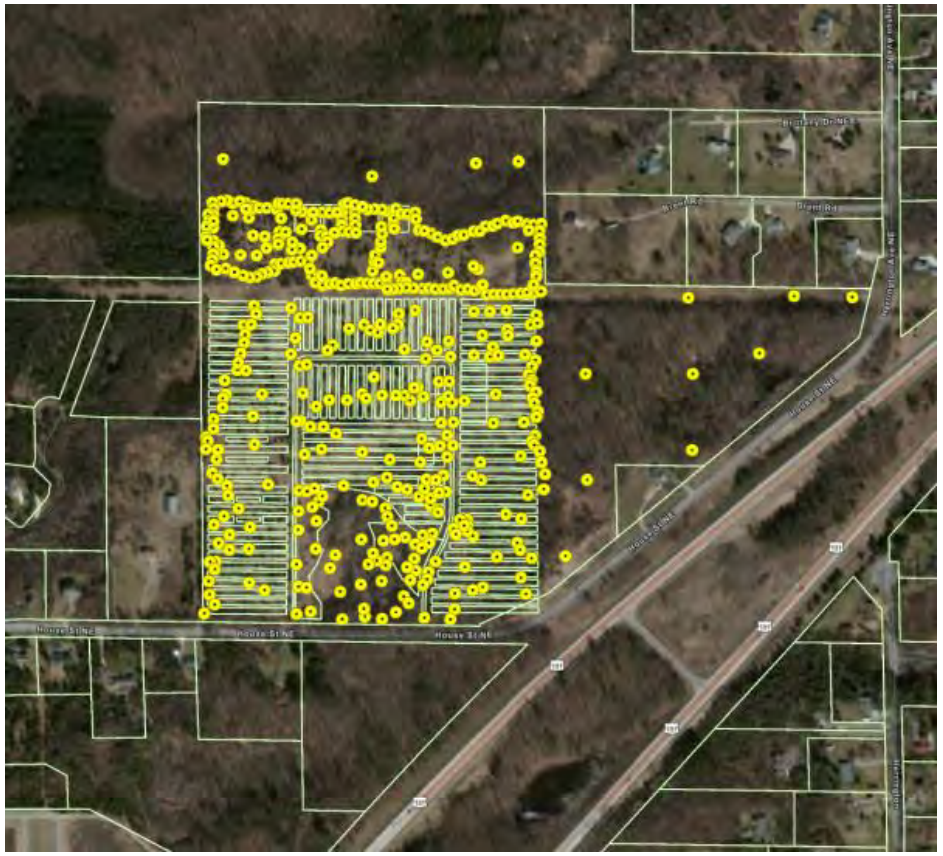
Drums and leather scraps on House Street

- 1930s/1940 – First reference to Wolverine disposal activities on House Street.
- 1964 – Wolverine purchases site
- 1966 – Licensed disposal facility
- 1970 – Disposal activities stop
- 2017 –Citizen group meets with DEQ

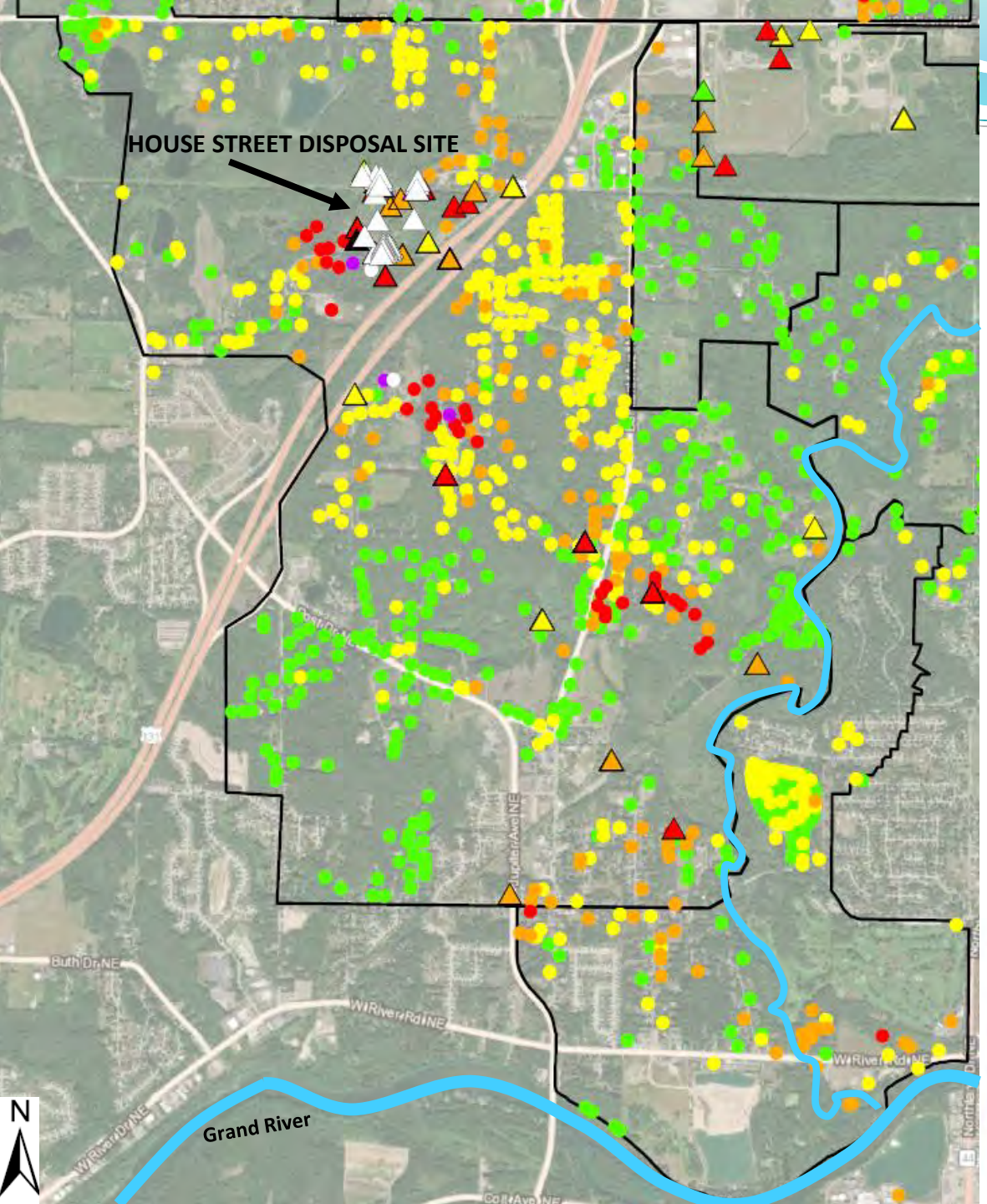
House Street Disposal Site Aerial: 1965 USGS

House Street – Waste & Soil Sampling

- 676 Soil Borings Installed
- 284 Soil Borings Contained Waste (PFAS concentrations as high as 220,000 ppb in the waste)
- 874 soil samples collected (PFAS concentrations as high as 81,000 ppb in the soil)



Soil Sample Locations on House Street Site – Figure from USEPA



House Street- PFAS Groundwater Results

Permanent Groundwater Monitoring Wells

- On-site: **14** wells in **7** locations
- Off-site: **34** wells at **13** locations
- **12** proposed locations

Residential Well Sampling Location

MAXIMUM DETECTED PFOS + PFOA (PPT)

- Non-Detect
- >0 to 10
- >10 to 70
- >70 to 1,000
- >1,000 to 5,000
- >5,000 to 10,000
- >10,000 to 76,000

Groundwater Sampling Location

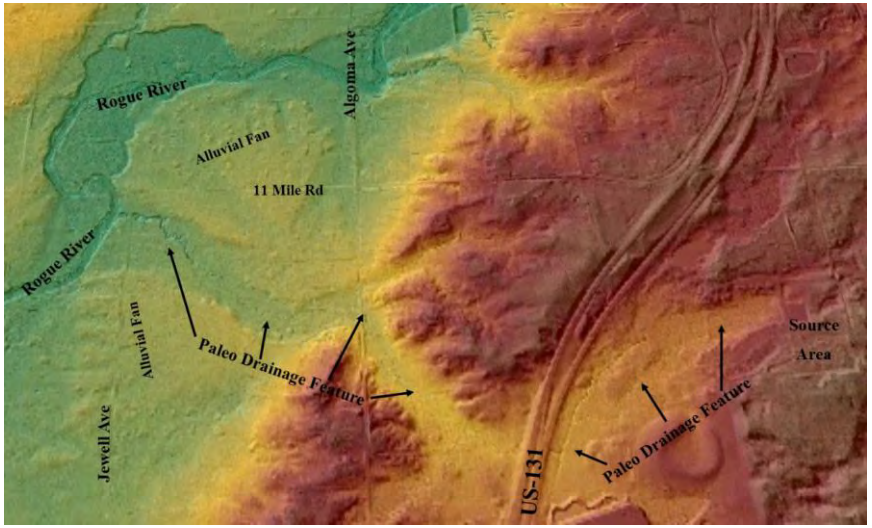
MAXIMUM DETECTED PFOS + PFOA (PPT)

- Non-Detect
- >0 to 10
- >10 to 70
- >70 to 1,000
- >1,000 to 5,000
- >5,000 to 10,000
- >10,000 to 550,000

Wolven/Jewell History

- Gravel pit where disposal occurred is active in the 1950s but inactive by 1965
- Different waste stream then House Street
- Wolverine began well sampling Fall 2017
- DEQ and EPA conducted soil sampling Summer 2018

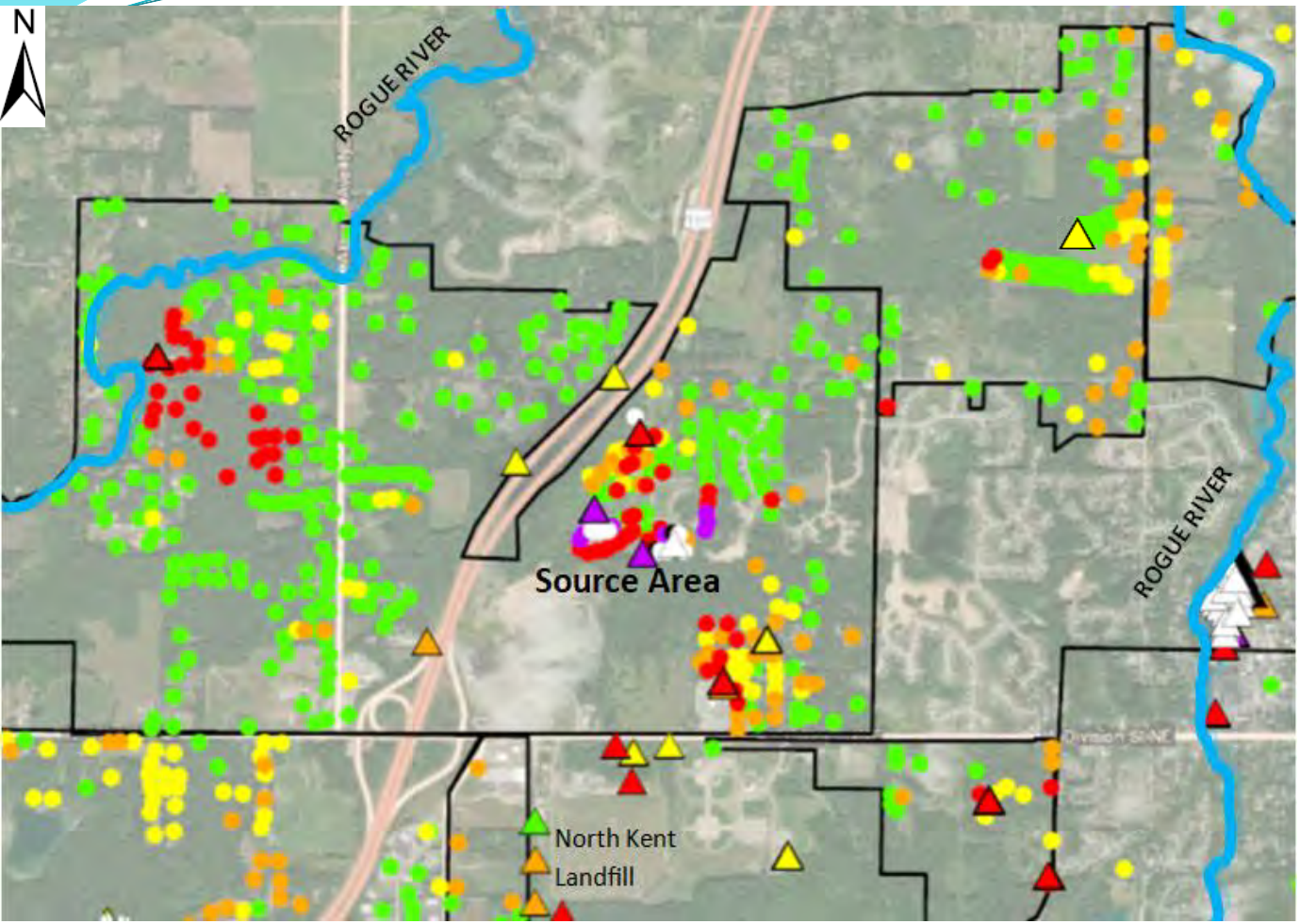
Kent County LIDAR



1953 USGS

EPA & DEQ Soil Sampling

Wolven/Jewell PFAS Results



Residential Well Sampling Location

- Non-Detect
- >0 to 10
- >10 to 70
- >70 to 1,000

MAXIMUM DETECTED PFOS + PFOA (PPT)

- >1,000 to 5,000
- >5,000 to 10,000
- >10,000 to 76,000

Groundwater Sampling Location

- Non-Detect
- >0 to 10
- >10 to 70
- >70 to 1,000

MAXIMUM DETECTED PFOS + PFOA (PPT)

- >1,000 to 5,000
- >5,000 to 10,000
- >10,000 to 670,000

Wolverine Monitoring Wells

- 28 wells at 14 locations
- 3 proposed locations

DEQ Monitoring Wells

- 14 wells at 4 locations
- 5 proposed locations

North Kent Landfill

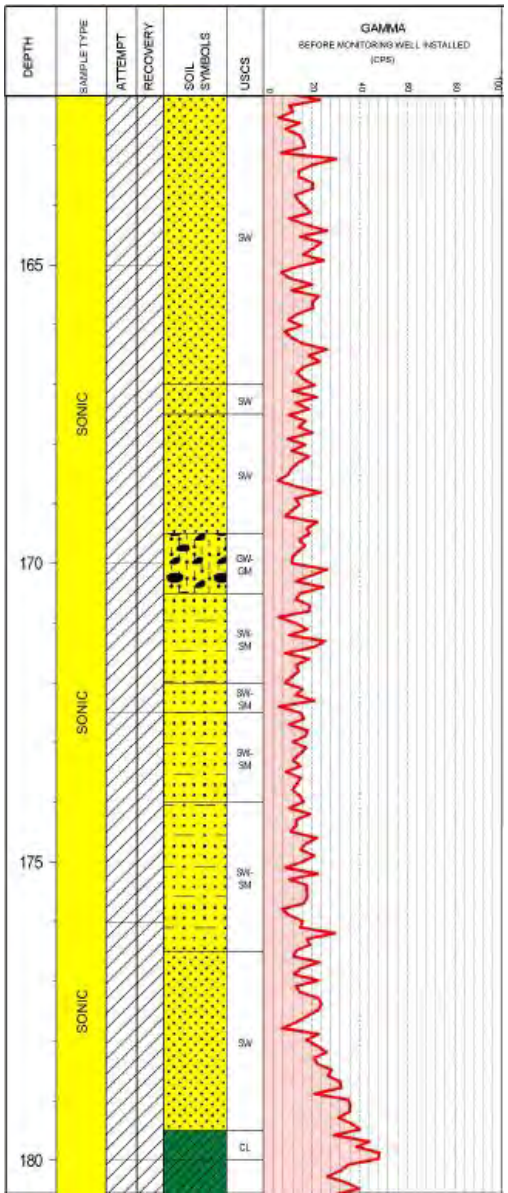
- Existing wells being sampled and monitored
- Lower PFAS levels detected at landfill in comparison to levels found in Wolven/Jewell study area.

DEQ Hydrogeologic Investigation

- During 2018, DEQ installed and sampled 24 permanent monitoring wells to aid in understanding the overall PFAS impact in northern Kent County.
- Additional DEQ investigation activities will continue in 2019.

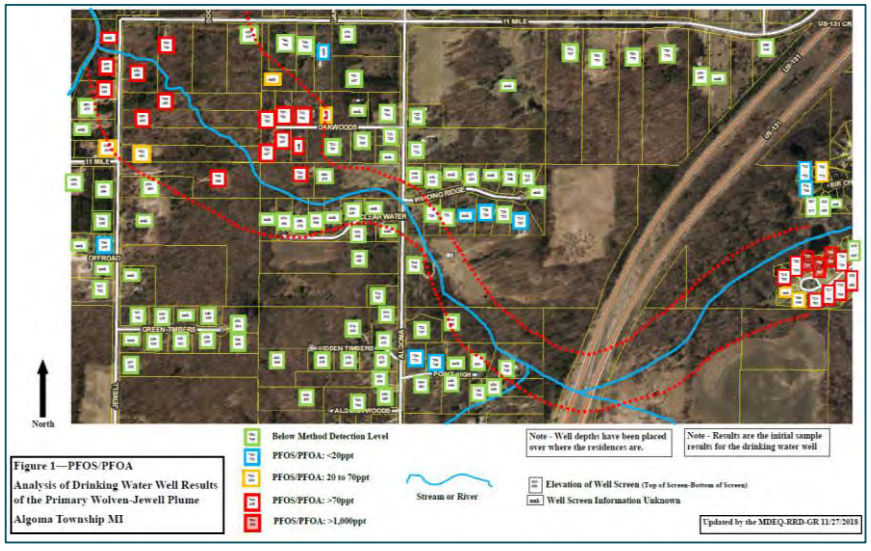
October 2018: DEQ subcontractor drilling crew installing permanent groundwater monitoring wells

Example Soil Boring Log



DEQ Will Continue:

- Community Engagement
- Scrutiny and Review of Wolverine Data
- Oversight of Wolverine Activities under Part 201
- DEQ Hydrogeological Investigation & Conceptual Site Models
- Litigation Activities



DEQ Conceptual Site Model Figure Example

DEQ Field Documentation of Soil Lithology

Michigan Department of Environmental Quality

800-662-9278

www.michigan.gov/belmont

DEQ

Wolverine World Wide Site Public Meeting

March 26, 2019

Jeff Kimble, EPA Region 5 OSC

Summary of Activities

- 2011 – EPA was asked to allow local/State entities to have jurisdiction over future activities at the tannery property
- December 2017 EPA became reengaged
  - Focus on CERCLA contamination, MDEQ PFAS focus
- EPA and MI took action in January 2018:
  - Federal CERCLA Section 106 UAO to address hazardous substances contamination at the Tannery and House Street Disposal location
  - State complaint against WWW filed in federal court under RCRA Section 7002, MI Part 201 and MI Part 31 that addresses PFAS contamination and provision of alternate drinking water

EPA/MDEQ team approach

- EPA and MDEQ work together to advance investigation at both properties
- EPA agreed to support MDEQ in the investigation into other sites
- EPA is the lead for CERCLA hazardous substances, MDEQ is the lead for PFAS
- Work plans for both sites were developed to satisfy the EPA order, and Wolverine agreed to co-locate samples for PFAS to satisfy the state complaint
- Goal is a comprehensive approach

EPA Order

- Tasked Wolverine World Wide, Inc.
  - Conduct investigation at Tannery and Former House Street Dump
    - Soil
    - Groundwater
    - Surface water
    - Soil Gas
  - EPA/MDEQ collected split samples
  - Based on the results determine next steps
    - In progress

Results

- Compare to generic action levels – in this process now
  - Assistance from ATSDR/MDHHS/Local Health for emergency decisions
  - EPA Removal Management Levels (RMLs)
  - MDEQ/State of Michigan Criteria
    - Direct Contact (residential)
    - Groundwater-surface water interface (GSI)
    - Drinking Water criteria (Part 201)

House street location

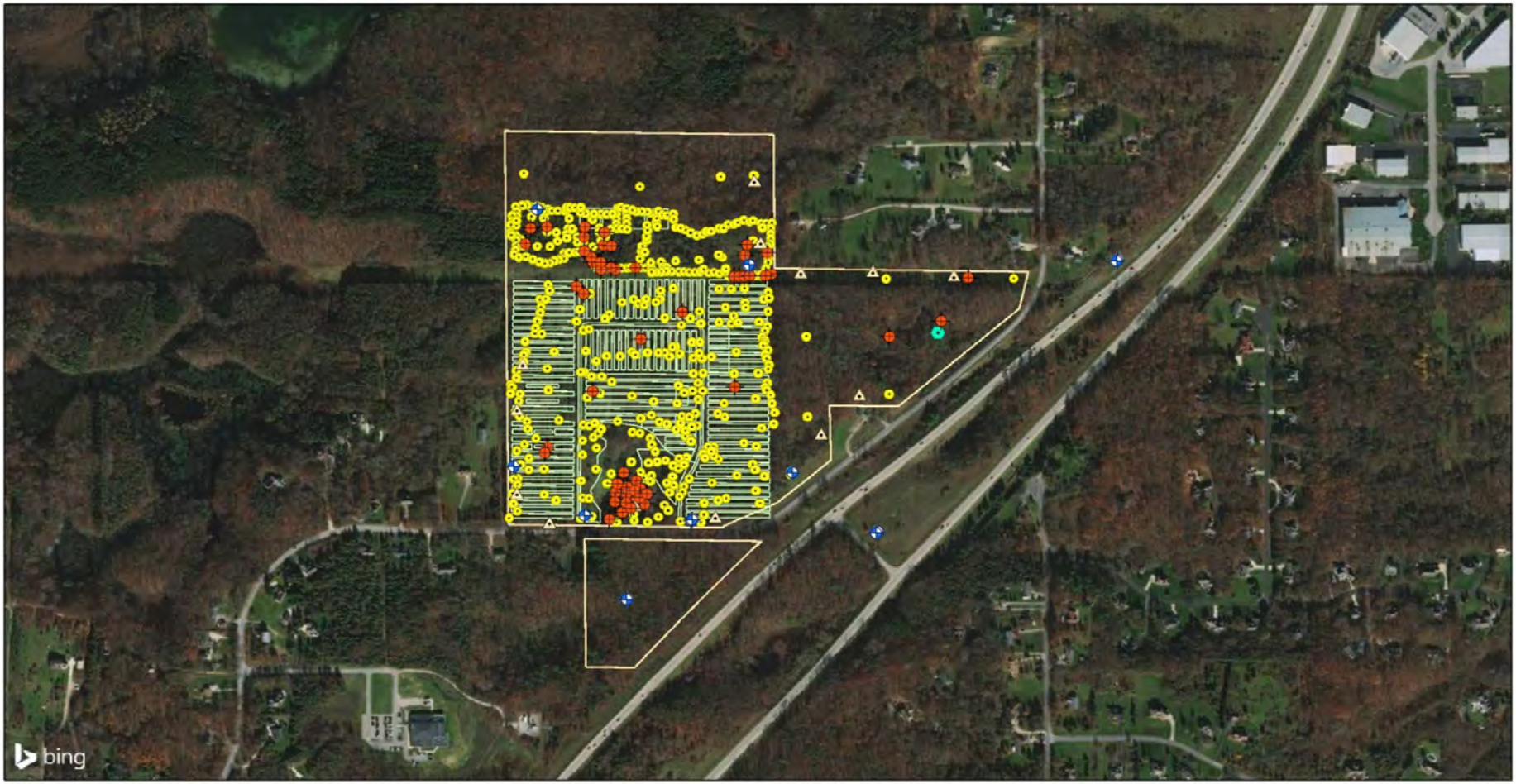
- Soil sampling
  - 676 soil boring locations
  - 999 soil samples
    - Majority of samples from “clean” soils
    - 254 boring locations with visual waste
      - 79 samples collected
- Soil gas sampling
  - 13 soil gas locations
  - 2 rounds
  - 93 total samples collected

House street location

Groundwater sampling

- 11 permanent groundwater monitoring well locations (deep) with 22 discrete intervals
  - 43 samples
- 54 temp wells (shallow) installed – “perched”
  - 81 perched GW samples collected

House Street Sampling Location Summary



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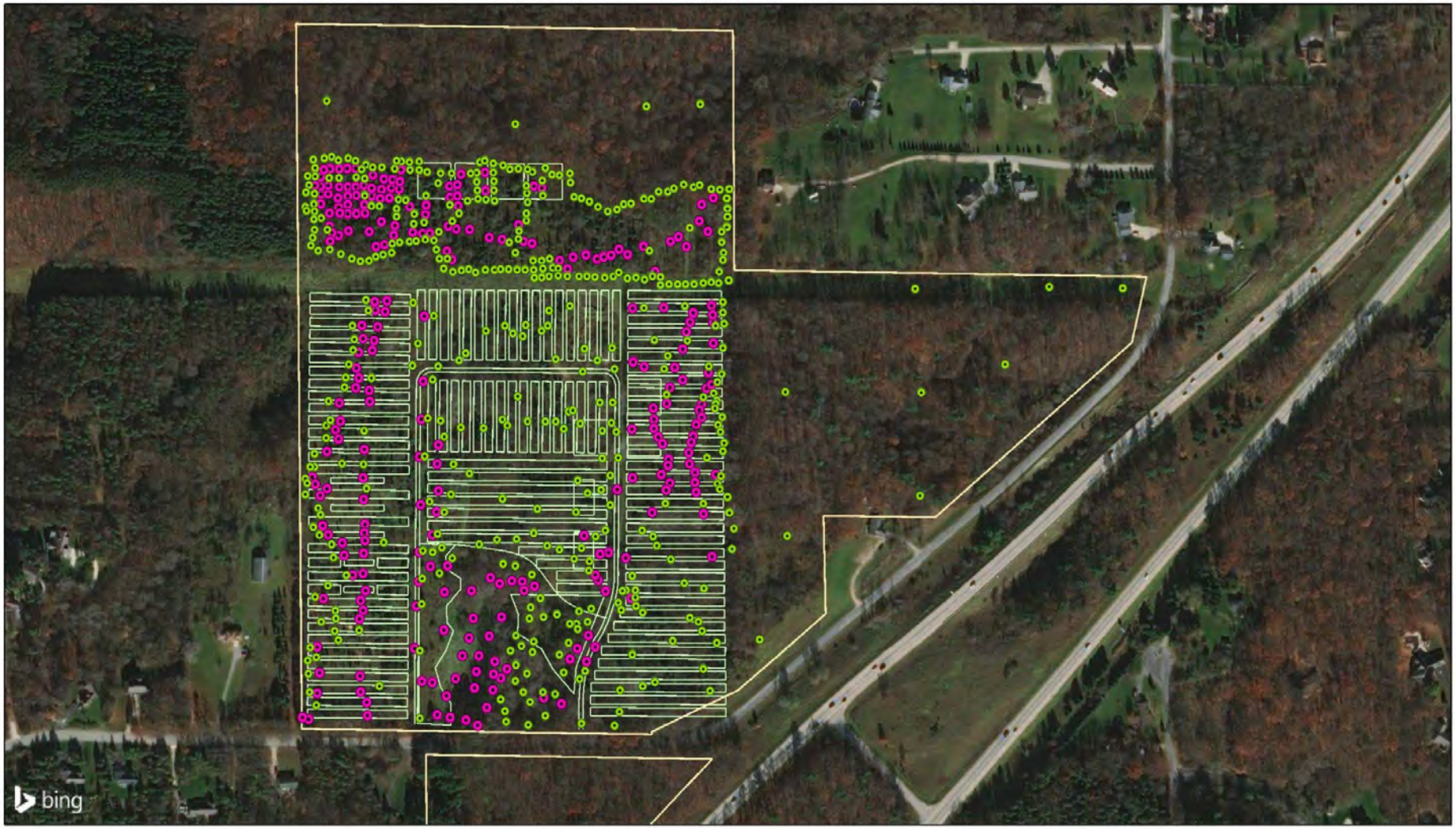
- House Street - Groundwater Samples (Deep)
- House Street - Groundwater Samples (Perched)
- Surface Water Samples
- Soil Gas Samples
- House Street - Soil Samples
- House St 1966 Proposed Site Plan
- House Street Parcels

1:7,644

0	500	1,000	2,000 ft
0	155	310	620 m

U.S. EPA Region 5

House Street Waste Observation Summary



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1:4,514

Waste Observations

- Y
- N
- House St 1966 Proposed Site Plan
- House Street Parcels

0 305 610 1,220 ft

0 90 180 360 m

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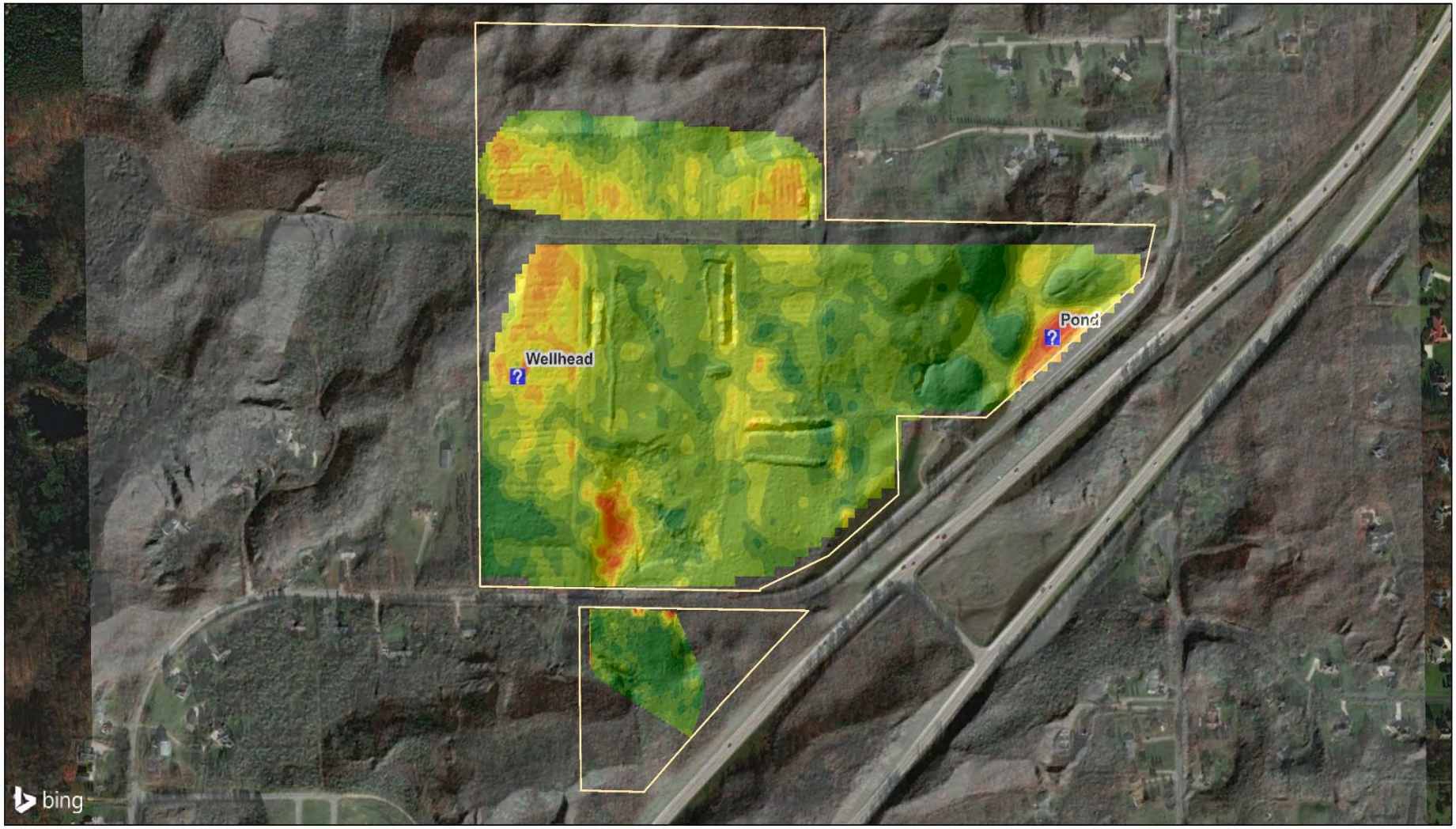
House Street GEM-2 Terrain Conductivity Survey Summary



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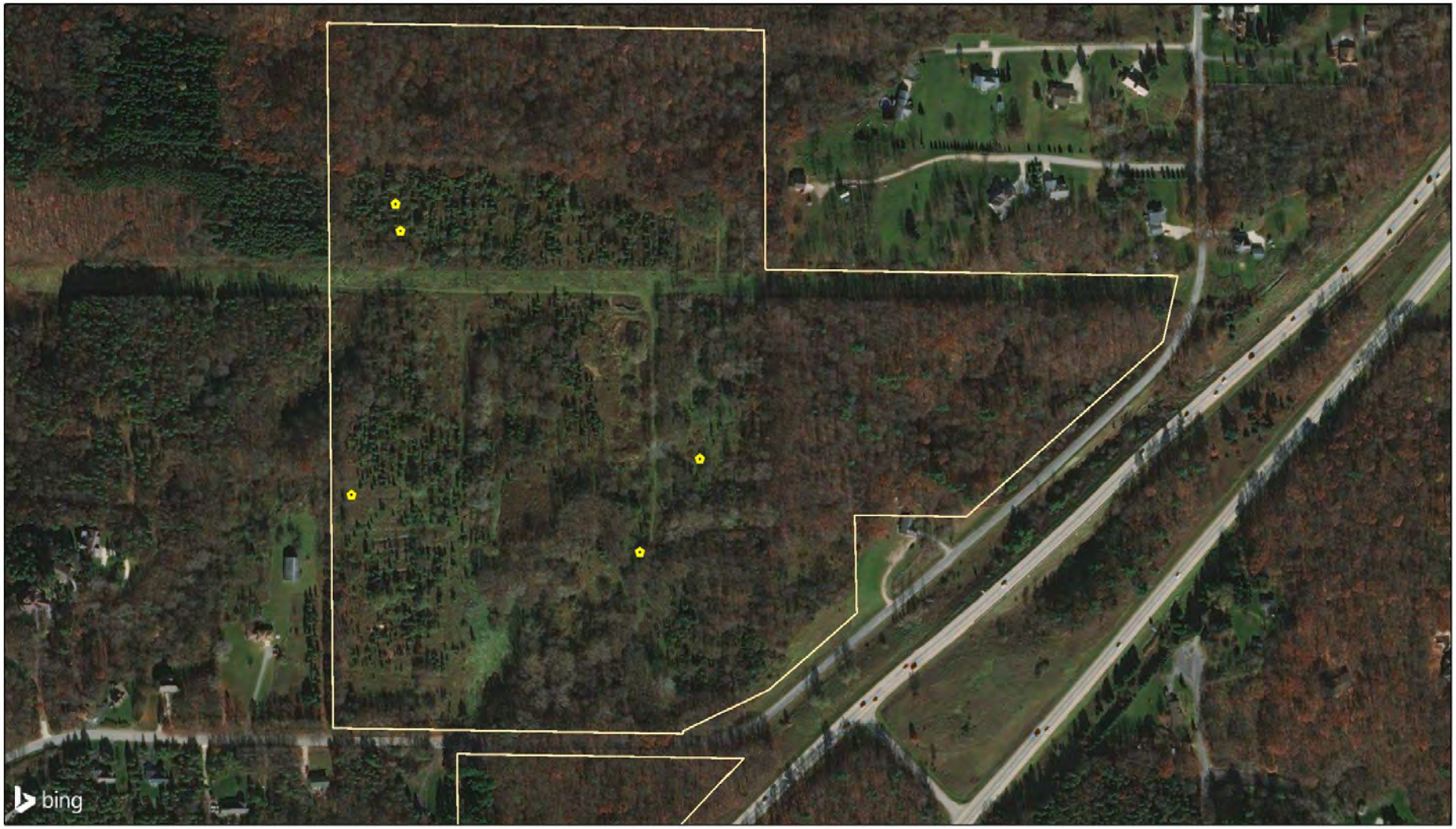
House Street Parcels
High : 254
Low : 0
GEM Notes
0 - 5
5 - 8
8 - 13
13 - 18
18 - 22
22 - 25
25 - 30
30 - 35
35 - 45
45 - >60
0 - 5
5 - 8
8 - 13
13 - 18
22 - 25
25 - 30
30 - 35
35 - 45
45 - >60
0 - 5
5 - 8
8 - 13
13 - 18
18 - 22
22 - 25
25 - 30
30 - 35
35 - 45
45 - >60
High : 85541
Low : 67750

1:5,648

0 380 760 1,520 ft
0 115 230 460 m

USEPA FIELD Services

House St Soil TCLP Hazardous Waste Exceedances - Metals



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TCLP Chromium ≥ 5 (EPA Haz)

House Street Parcels

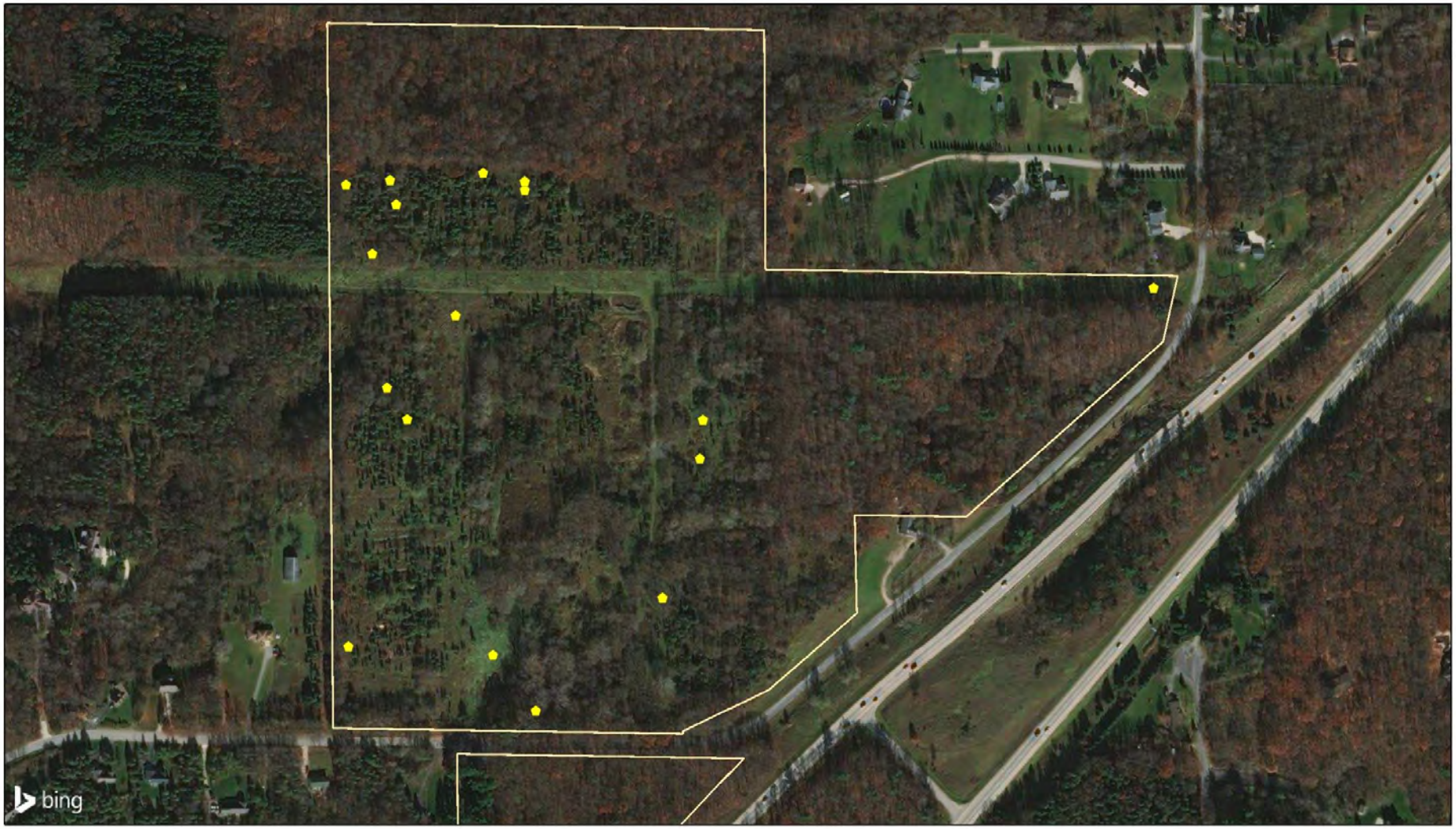
1:4,514

0 305 610 1,220 ft

0 90 180 360 m

U.S. EPA Region 5

House St Soil Residential RML Exceedances - Metals



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- Hex Chromium ≥ 30 (RMLs Res)
- Antimony ≥ 94 (RMLs Res)
- Arsenic ≥ 68 (RMLs Res)
- Iron ≥ 55000 (RMLs Res)
- Lead ≥ 400 (RMLs Res)
- Thalium ≥ 2.3 (RMLs Res)
- Mercury ≥ 33 (RMLs Res)
- House Street Parcels

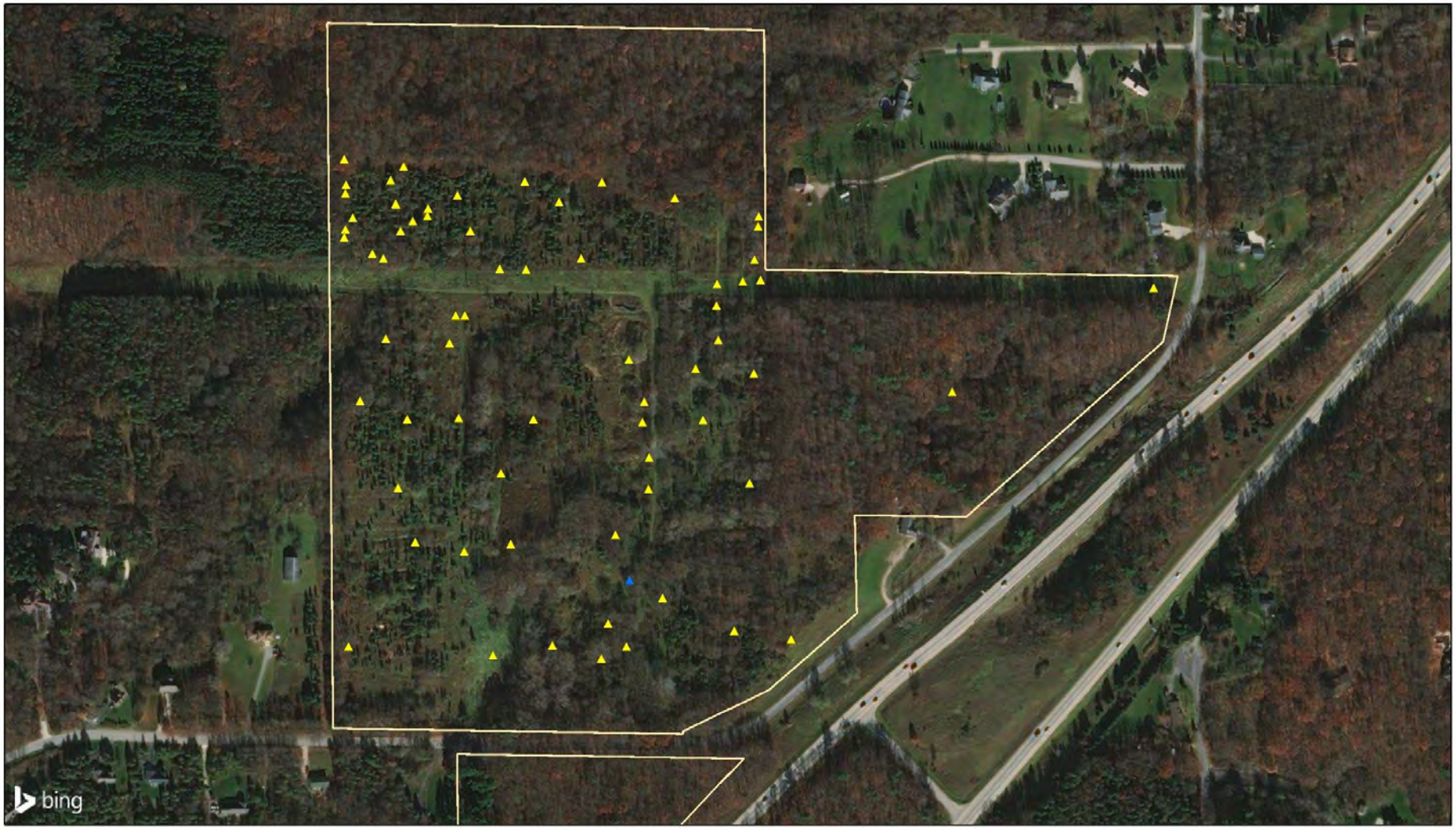
1:4,514

0 305 610 1,220 ft

0 90 180 360 m

U.S. EPA Region 5

House St Soil Residential Direct Contact Exceedances - Metals, SVOCs



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- Benzo(a)pyrene ≥ 2 (Res Direct)
- Antimony ≥ 180 (Res Direct)
- Arsenic ≥ 7.6 (Res Direct)
- Lead ≥ 400 (Res Direct)
- Soil Mercury ≥ 160 (Res Direct)
- Soil Vanadium ≥ 750 (Res Direct)
- House Street Parcels

1:4,514

0 305 610 1,220 ft

0 90 180 360 m

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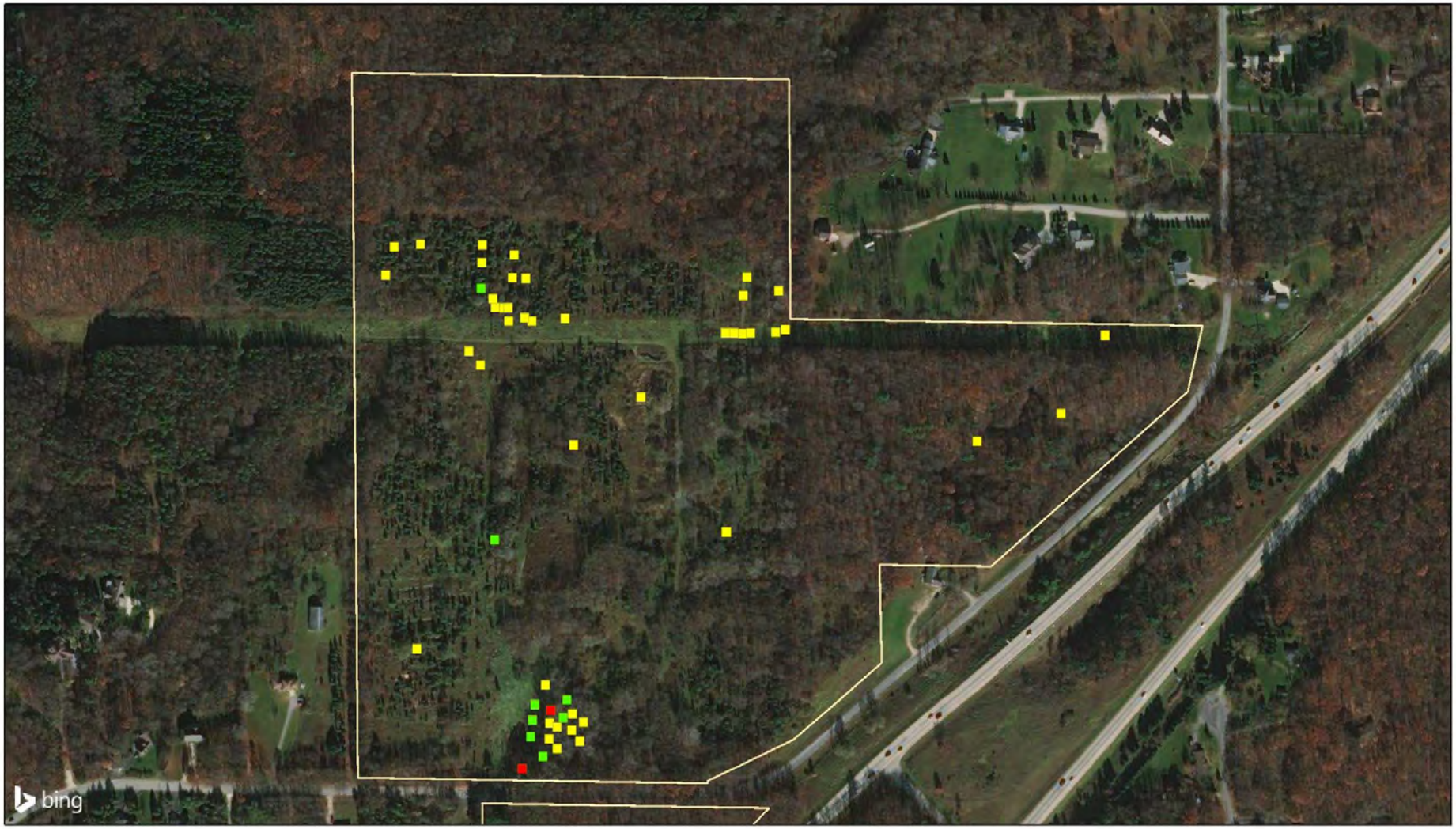
House St Perched GW Residential Drinking Water Exceedances - Metals, VOCs, General Chemistry



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- Groundwater Nitrate-Nitrite + Ammonia ≥ 10,000 (Res Drink)
- Groundwater Sulfate ≥ 250,000 (Res Drink)
- Groundwater Benzene ≥ 5.0 (Res Drink)
- Groundwater Chlorobenzene ≥ 100 (Res Drink)
- Groundwater Aluminum ≥ 50 (Res Drink)
- Groundwater Arsenic ≥ 10 (Res Drink)
- Groundwater Barium ≥ 2,000 (Res Drink)
- Groundwater Beryllium ≥ 4.0 (Res Drink)
- Groundwater Cadmium ≥ 5.0 (Res Drink)
- Groundwater Cobalt ≥ 40 (Res Drink)
- Groundwater Copper ≥ 1000 (Res Drink)
- Groundwater Trivalent Chromium ≥ 100 (Res Drink)
- Groundwater Iron ≥ 300 (Res Drink)
- Groundwater Lead ≥ 4.0 (Res Drink)
- Groundwater Magnesium ≥ 400,000 (Res Drink)
- Groundwater Molybdenum ≥ 73 (Res Drinkl)
- Groundwater Nickel ≥ 100 (Res Drink)
- Groundwater Thallium ≥ 2.0 (Res Drink)
- Groundwater Vanadium ≥ 4.5 (Res Drink)
- Groundwater Zinc ≥ 2,400 (Res Drinkl)
- House Street Parcels

1:4,514

0 305 610 1,220 ft

0 90 180 360 m

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House St Deep GW Residential Drinking Water Exceedances - Metals, General Chemistry

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- Groundwater Acetic Acid ≥ 4200 (Res Drink)
- Groundwater Chloride ≥ 250,000 (Res Drink)
- Groundwater Nitrate-Nitrite + Ammonia ≥ 10,000 (Res Drink)
- Groundwater Sulfate ≥ 250,000 (Res Drink)
- Groundwater Aluminum ≥ 50 (Res Drink)
- Groundwater Iron ≥ 300 (Res Drink)
- House Street Parcels

1:5,652

0 380 760 1,520 ft

0 115 230 460 m

U.S. EPA Region 5

Tannery location

- Soil sampling
  - 113 boring locations
  - 244 soil samples
  - Screening showed:
    - 12 Locations with observed leather scraps
- Sediment Sampling
  - 10 Transects
  - 33 Sediment Cores
  - 91 sediment samples

Tannery location

- Groundwater sampling
  - 2 rounds of sampling
  - 56 Sampling Locations
  - 118 groundwater samples collected
- Surface Water Sampling
  - 2 rounds of sampling
  - 7 locations in Rogue River and Rum Creek
  - 16 surface water samples
- Soil Gas Sampling
  - 2 rounds of sampling
  - 10 soil gas well locations
  - 22 soil gas samples collected

Tannery Sampling Location Summary

3/25/2019 11:34:12 AM

- Tannery - Groundwater Samples
- Tannery - Sediment Samples
- Surface Water Samples
- Soil Gas Samples
- Tannery - Soil Samples

1:7,644

0 500 1,000 2,000 ft

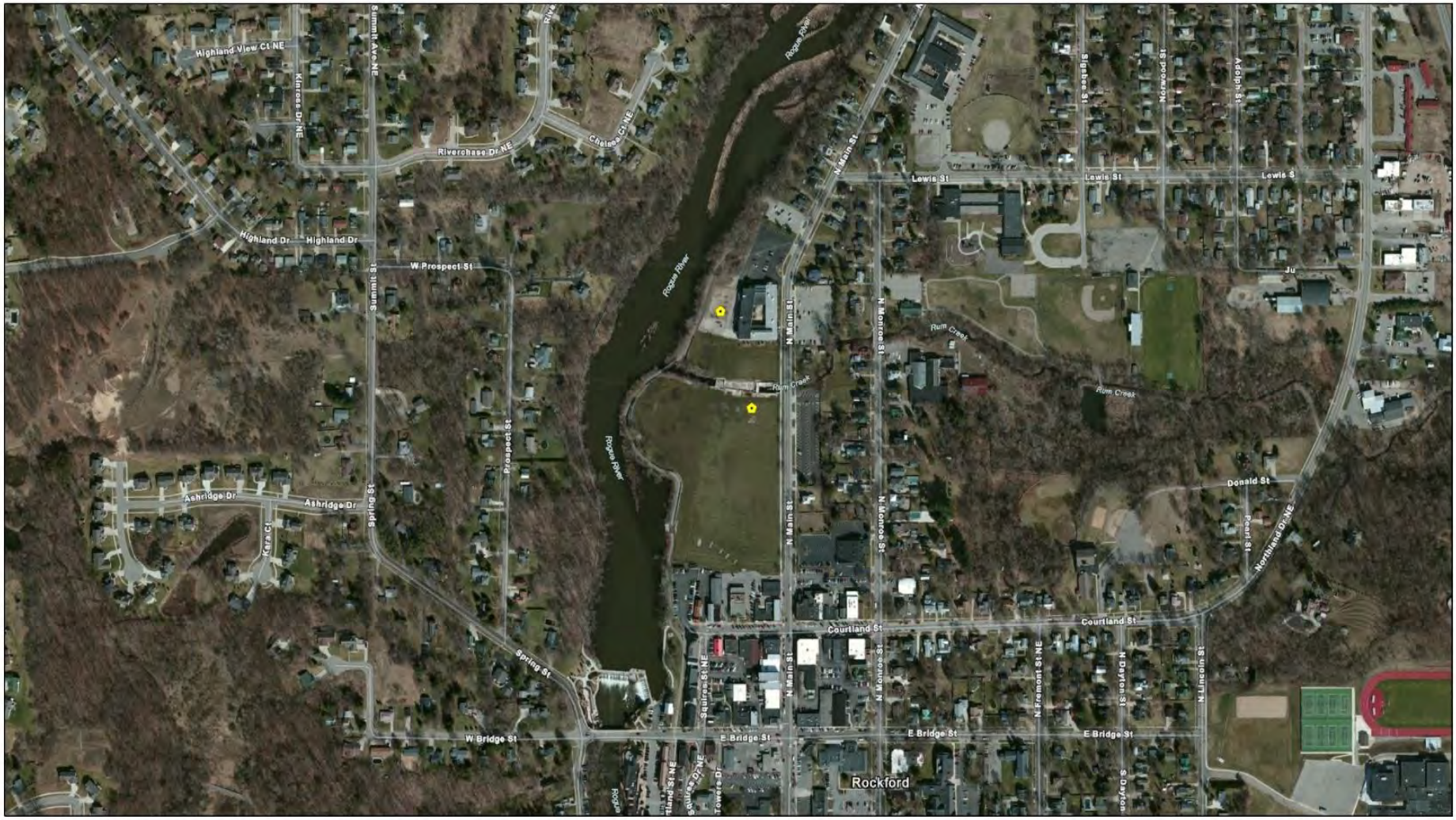
0 155 310 620 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Soil TCLP Hazardous Waste Exceedances - Metals



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- TCLP Chromium ≥ 5 (EPA Haz)
- TCLP Lead ≥ 5 (EPA Haz)

1:6,104

0 410 820 1,640 ft

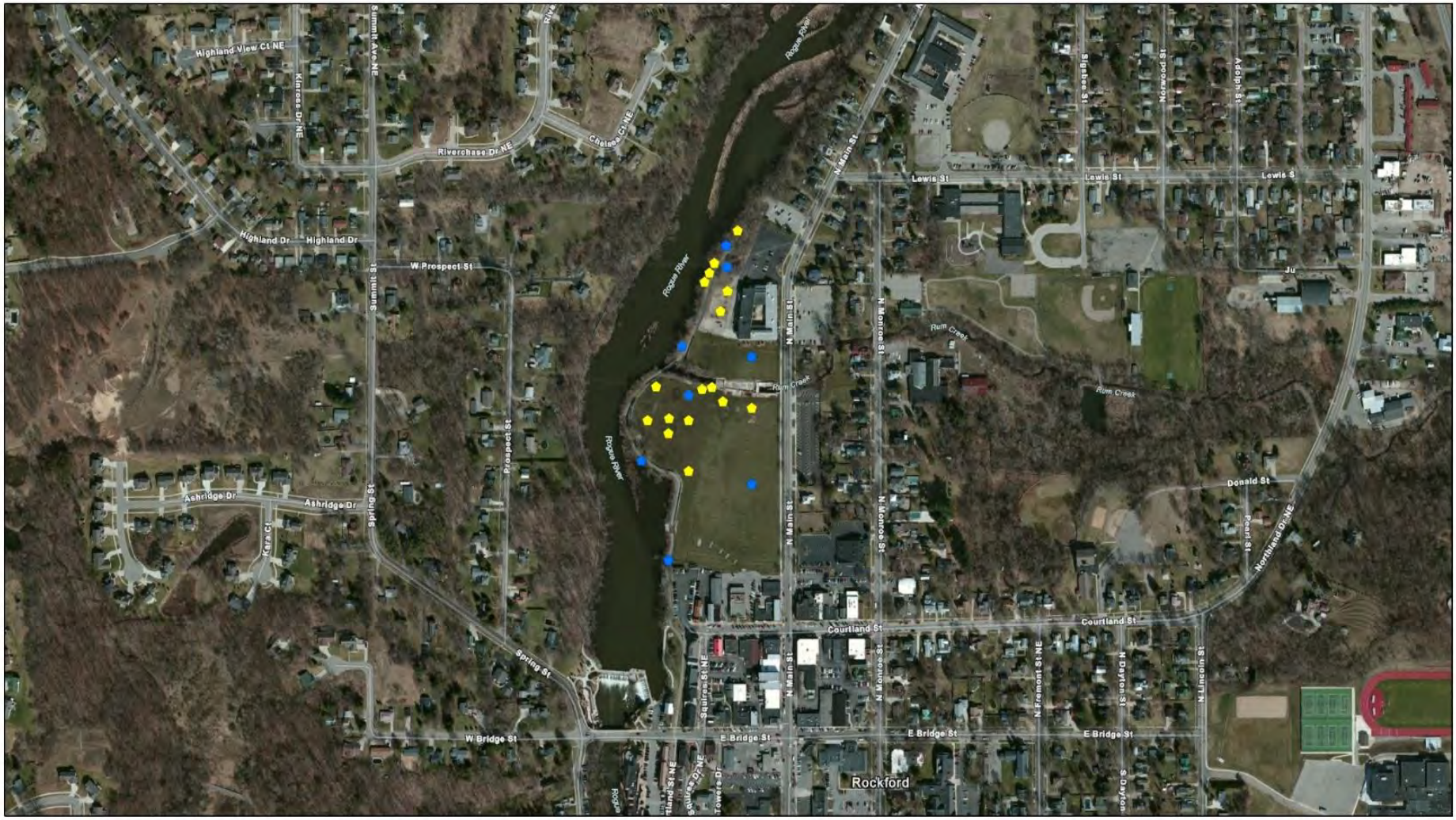
0 125 250 500 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Soil RML Exceedances - Metals, SVOCs



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- Benzo(a)pyrene ≥ 11 (RMLs Res)
- Hex Chromium ≥ 30 (RMLs Res)
- Iron ≥ 55000 (RMLs Res)
- Lead ≥ 400 (RMLs Res)
- Thalium ≥ 2.3 (RMLs Res)
- Mercury ≥ 33 (RMLs Res)

1:6,104

0 410 820 1,640 ft

0 125 250 500 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Soil Residential Direct Contact Exceedances - Metals, SVOCs, General Chemistry

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- Chloride (Soluble) ≥ 500 (Res Direct)
- Benzo(a)anthracene ≥ 20 (Res Direct)
- Benzo(a)pyrene ≥ 2 (Res Direct)
- Benzo(b)fluoranthenee ≥ 20 (Res Direct)
- Indeno(1,2,3-c,d) pyrene ≥ 20 (Res Direct)
- Arsenic ≥ 7.6 (Res Direct)
- Lead ≥ 400 (Res Direct)
- Soil Mercury ≥ 160 (Res Direct)

1:6,104

0 410 820 1,640 ft

0 125 250 500 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Soil GSI Exceedances - Metals

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1:6,104

0 410 820 1,640 ft

0 125 250 500 m

- Antimony ≥ 1.2 (GSI)
- Arsenic ≥ 4.6 (GSI)
- Barium ≥ 660 (GSI)
- Boron ≥ 80 (GSI)
- Cadmium ≥ 3 (GSI)
- Hex Chromium ≥ 3.3 (GSI)
- Cobalt ≥ 2 (GSI)
- Copper ≥ 100 (GSI)
- Lead ≥ 2500 (GSI)
- Mercury ≥ 0.13 (GSI)
- Molybdenum ≥ 2.4 (GSI)
- Selenium ≥ 0.41 (GSI)
- Silver ≥ 1 (GSI)
- Thalium ≥ 1.4 (GSI)
- Zinc ≥ 230 (GSI)

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Tannery Soil GSI Exceedances - Metals, VOCs, SVOCs

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1:6,104

0 410 820 1,640 ft

0 125 250 500 m

- 1,1,1 Trichloroethane ≥ 1.8 (GSI)
- 1,1,2,2 Tetrachloroethane ≥ 0.064 (GSI)
- 1,1,2 Trichloroethane ≥ 0.24 (GSI)
- 1,2 Dichloroethane ≥ 0.12 (GSI)
- Benzene ≥ 0.24 (GSI)
- Bromomethane ≥ 0.1 (GSI)
- Ethylbenzene ≥ 0.36 (GSI)
- Tetrachloroethylene ≥ 0.22 (GSI)
- Trichloroethylene ≥ 0.58 (GSI)
- Xylenes (total) ≥ 0.98 (GSI)
- 2-Methylnaphthalene ≥ 4.2 (GSI)
- Acenaphthene ≥ 8.7 (GSI)
- bis(2-Chloroehtyl)ether ≥ 0.1 (GSI)
- Carbazole ≥ 1.1 (GSI)
- Dibenzofuran ≥ 1.7 (GSI)
- Fluoranthene ≥ 5.5 (GSI)
- Fluroene ≥ 5.3 (GSI)
- Napthalene ≥ 0.73 (GSI)
- Phenanthrene ≥ 2.1 (GSI)
- Antimony ≥ 1.2 (GSI)
- Arsenic ≥ 4.6 (GSI)
- Barium ≥ 660 (GSI)
- Boron ≥ 80 (GSI)
- Cadmium ≥ 3 (GSI)
- Hex Chromium ≥ 3.3 (GSI)
- Cobalt ≥ 2 (GSI)
- Copper ≥ 100 (GSI)
- Lead ≥ 2500 (GSI)
- Mercury ≥ 0.13 (GSI)
- Molybdenum ≥ 2.4 (GSI)
- Selenium ≥ 0.41 (GSI)
- Silver ≥ 1 (GSI)
- Thalium ≥ 1.4 (GSI)
- Zinc ≥ 230 (GSI)

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Soil GSI Exceedances - Metals, VOCs, SVOCs, General Chemistry

3/22/2019 11:53:25 AM

- Ammonia Unionized ≥ 0.58 (GSI)
- Chloride (Soluble) ≥ 1000 (GSI)
- Cyanide Total ≥ 0.1 (GSI)
- Phosphorous ≥ 20 (GSI)
- 1,1,1 Trichloroethane ≥ 1.8 (GSI)
- 1,1,2,2 Tetrachloroethane ≥ 0.084 (GSI)
- 1,1,2 Trichloroethane ≥ 0.24 (GSI)
- 1,2 Dichloroethane ≥ 0.12 (GSI)
- Benzene ≥ 0.24 (GSI)
- Bromomethane ≥ 0.1 (GSI)
- Ethylbenzene ≥ 0.36 (GSI)
- Tetrachloroethylene ≥ 0.22 (GSI)
- Trichloroethylene ≥ 0.58 (GSI)
- Xylenes (total) ≥ 0.98 (GSI)
- 2-Methylnaphthalene ≥ 4.2 (GSI)
- Acenaphthene ≥ 8.7 (GSI)
- bis(2-Chloroehtyl)ether ≥ 0.1 (GSI)
- Carbazole ≥ 1.1 (GSI)
- Dibenzofuran ≥ 1.7 (GSI)
- Fluoranthene ≥ 5.5 (GSI)
- Fluroene ≥ 5.3 (GSI)
- Napthalene ≥ 0.73 (GSI)
- Phenanthrene ≥ 2.1 (GSI)
- Antimony ≥ 1.2 (GSI)
- Arsenic ≥ 4.6 (GSI)
- Barium ≥ 660 (GSI)
- Boron ≥ 80 (GSI)
- Cadmium ≥ 3 (GSI)
- Hex Chromium ≥ 3.3 (GSI)
- Cobalt ≥ 2 (GSI)
- Copper ≥ 100 (GSI)
- Lead ≥ 2500 (GSI)
- Mercury ≥ 0.13 (GSI)
- Molybdenum ≥ 2.4 (GSI)
- Selenium ≥ 0.41 (GSI)
- Silver ≥ 1 (GSI)
- Thalium ≥ 1.4 (GSI)
- Zinc ≥ 230 (GSI)

1:6,104

0 410 820 1,640 ft

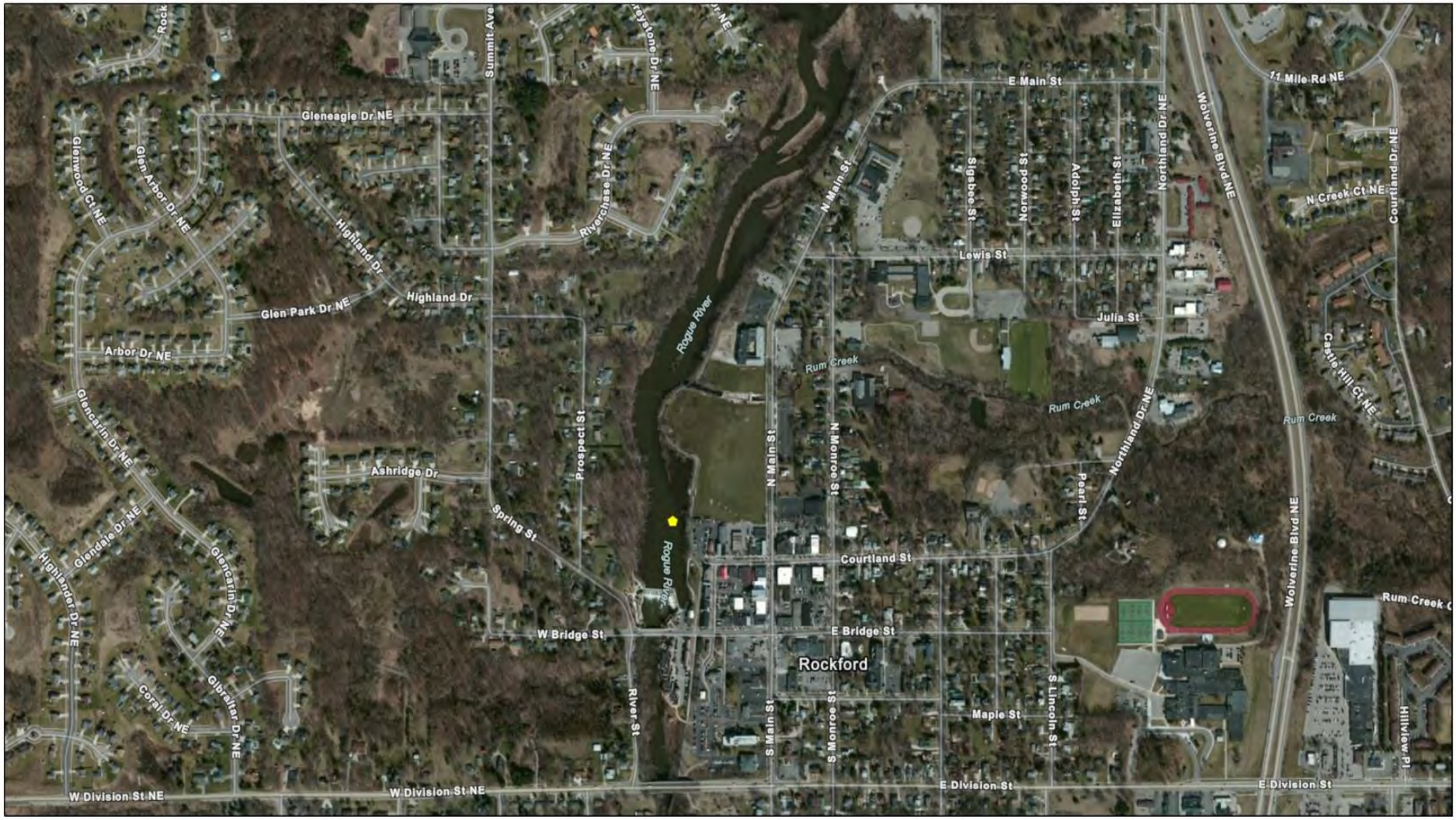
0 125 250 500 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Sediment RML Exceedances - Metals



3/22/2019 12:24:11 PM

Arsenic ≥ 68 (RMLs Res)

1:9,028

0 600 1,200 2,400 ft

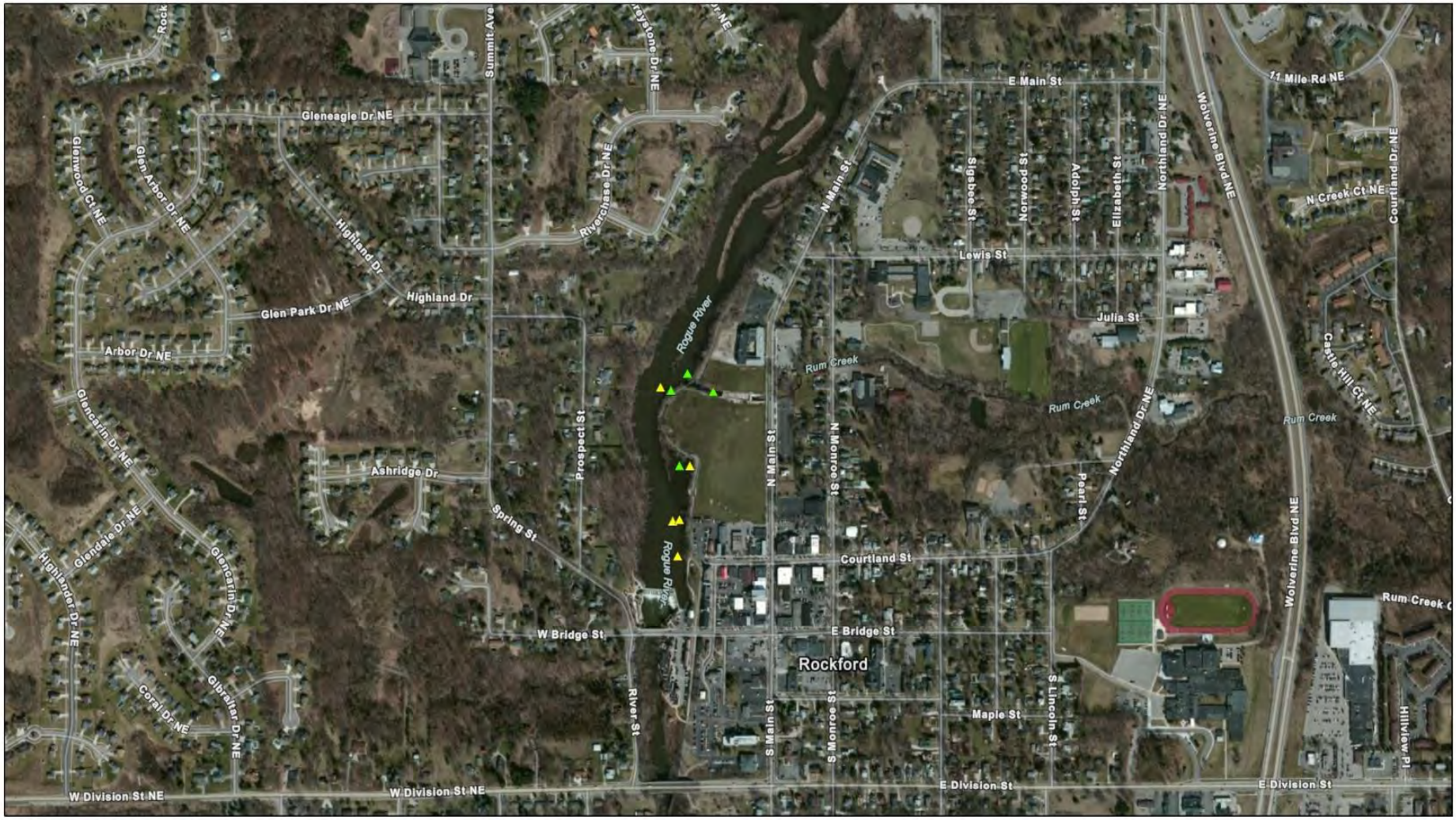
0 185 370 740 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Sediment Residential Direct Contact Criteria Exceedances - Metals, General Chemistry



3/22/2019 12:11:50 PM

- Chloride (Soluble) ≥ 500 (Res Direct)
- Arsenic ≥ 7.6 (Res Direct)

1:9,028

0 600 1,200 2,400 ft

0 185 370 740 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Sediment GSI Exceedances - Metals

3/22/2019 12:15:14 PM

- Arsenic ≥ 4.6 (GSI)
- Hex Chromium ≥ 3.3 (GSI)
- Cobalt ≥ 2 (GSI)
- Manganese ≥ 26 (GSI)
- Mercury ≥ .05 (GSI)
- Selenium ≥ 0.4 (GSI)
- Silver ≥ 0.1 (GSI)
- Zinc ≥ 230 (GSI)

1:9,028

0 600 1,200 2,400 ft

0 185 370 740 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Sediment GSI Exceedances - Metals, SVOCs, VOCs

3/22/2019 12:19:40 PM

- Bromomethane ≥ 0.1 (GSI)
- Napthalene ≥ 0.73 (GSI)
- Phenanthrene ≥ 2.1 (GSI)
- Arsenic ≥ 4.6 (GSI)
- Hex Chromium ≥ 3.3 (GSI)
- Cobalt ≥ 2 (GSI)
- Manganese ≥ 26 (GSI)
- Mercury ≥ .05 (GSI)
- Selenium ≥ 0.4 (GSI)
- Silver ≥ 0.1 (GSI)
- Zinc ≥ 230 (GSI)

1:9,028

0 600 1,200 2,400 ft

0 185 370 740 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

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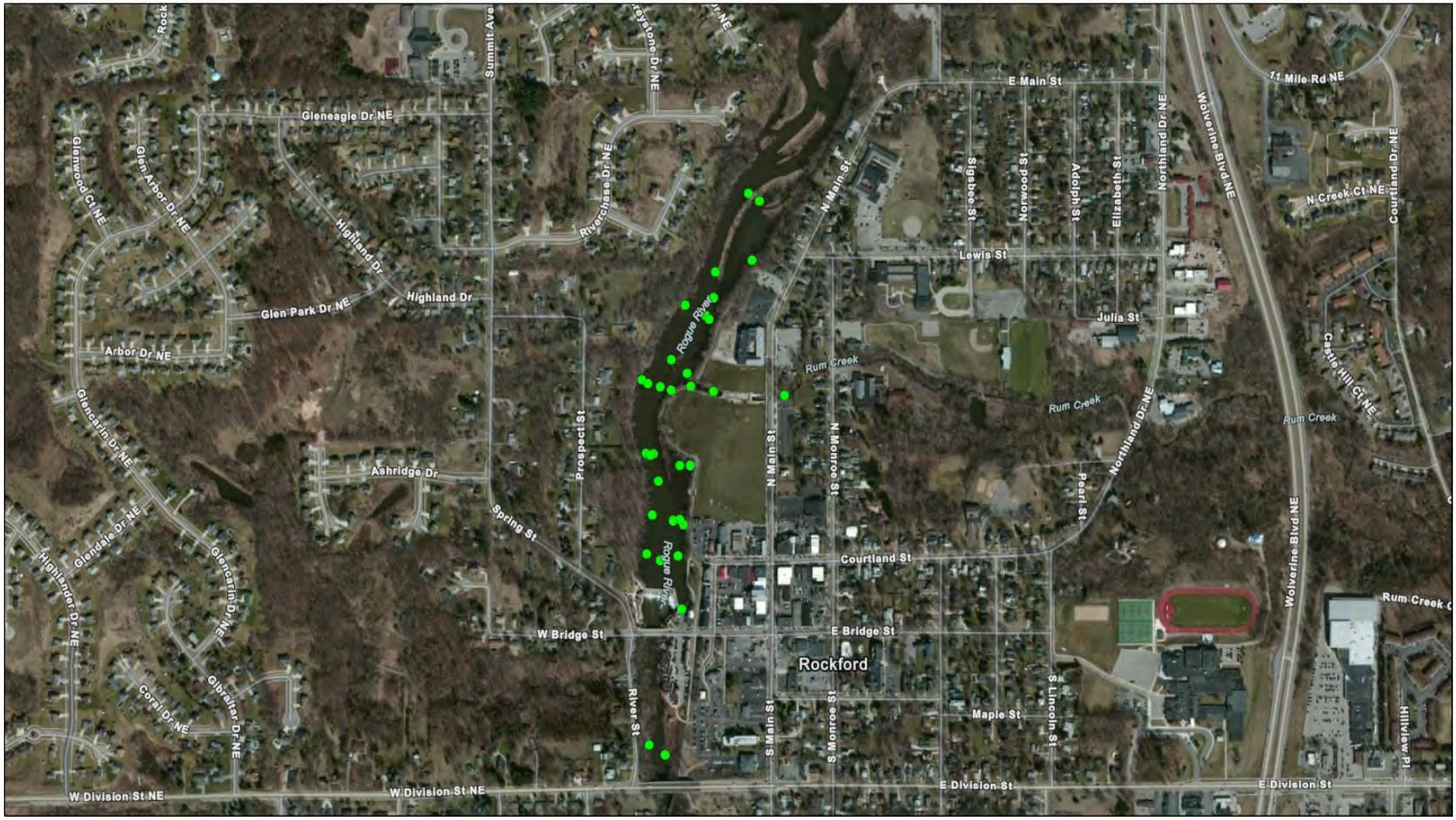
Tannery Sediment GSI Exceedances - Metals, SVOCs, VOCs, General Chemistry



3/22/2019 12:21:10 PM

- Ammonia Unionized ≥ 0.58 (GSI)
- Chloride (Soluble) ≥ 1000 (GSI)
- Cyanide Total ≥ 0.1 (GSI)
- Phosphorous ≥ 20 (GSI)
- Bromomethane ≥ 0.1 (GSI)
- Napthalene ≥ 0.73 (GSI)
- Phenanthrene ≥ 2.1 (GSI)
- Arsenic ≥ 4.6 (GSI)
- Hex Chromium ≥ 3.3 (GSI)
- Cobalt ≥ 2 (GSI)
- Manganese ≥ 26 (GSI)
- Mercury ≥ .05 (GSI)
- Selenium ≥ 0.4 (GSI)
- Silver ≥ 0.1 (GSI)
- Zinc ≥ 230 (GSI)

1:9,028

0 600 1,200 2,400 ft

0 185 370 740 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Soil Residential Direct Contact Exceedances - Metals, SVOCs, General Chemistry

3/22/2019 11:27:15 AM

- Chloride (Soluble) ≥ 500 (Res Direct)
- Benzo(a)anthracene ≥ 20 (Res Direct)
- Benzo(a)pyrene ≥ 2 (Res Direct)
- Benzo(b)fluoranthenee ≥ 20 (Res Direct)
- Indeno(1,2,3-c,d) pyrene ≥ 20 (Res Direct)
- Arsenic ≥ 7.6 (Res Direct)
- Lead ≥ 400 (Res Direct)
- Soil Mercury ≥ 160 (Res Direct)

1:6,104

0 410 820 1,640 ft

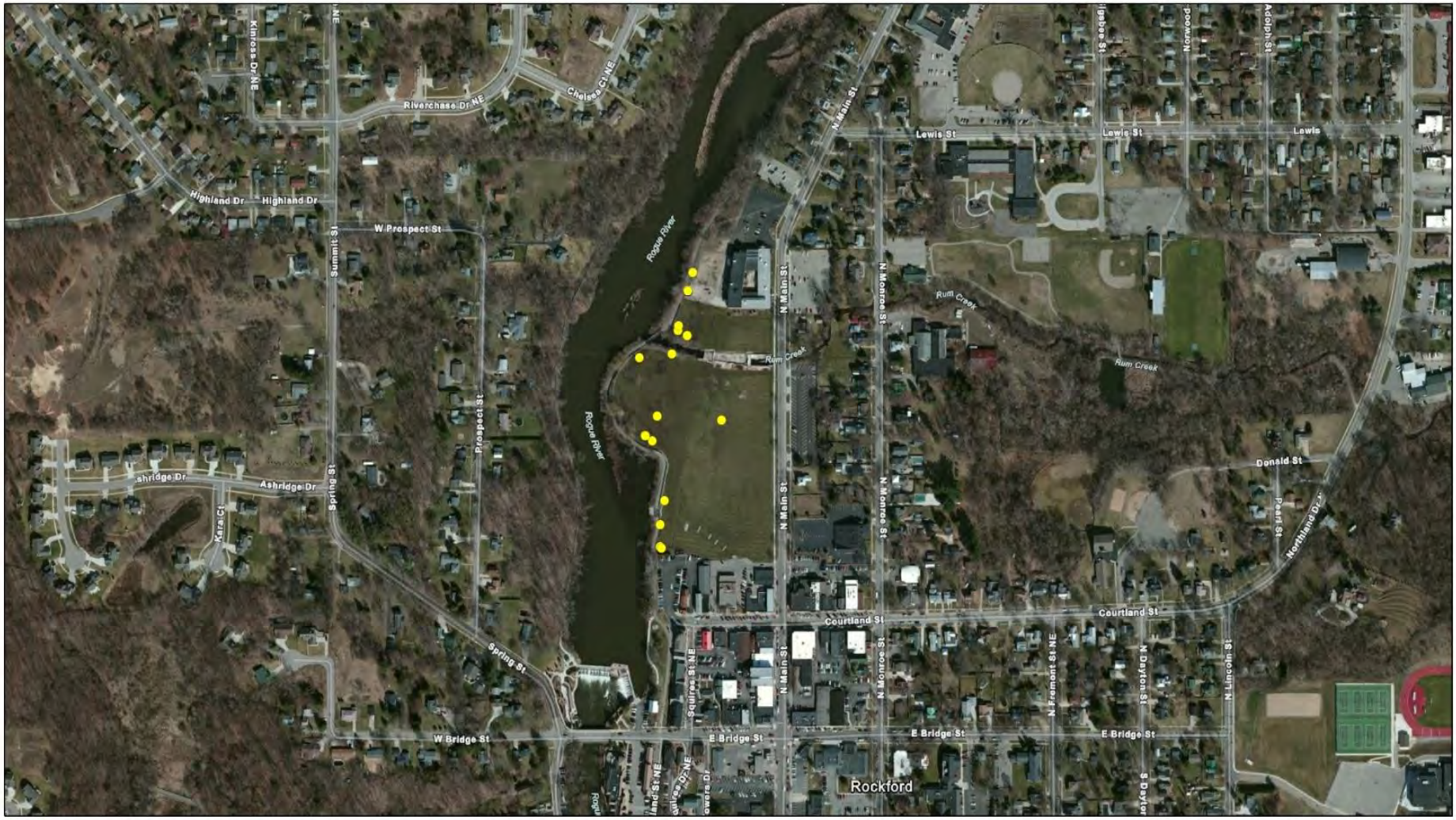
0 125 250 500 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Groundwater GSI Exceedances - Metals



3/22/2019 12:34:44 PM

- Groundwater Antimony ≥ 2.0 (GSI)
- Groundwater Arsenic ≥ 10 (GSI)
- Groundwater Cadmium ≥ 2.5 (GSI)
- Groundwater Trivalent Chromium ≥ 120 (GSI)
- Groundwater Hexavalent Chromium ≥ 11 (GSI)
- Groundwater Copper ≥ 18 (GSI)
- Groundwater Manganese ≥ 1,300 (GSI)
- Groundwater Mercury ≥ 0.0013 (GSI)
- Groundwater Vanadium ≥ 27 (GSI)
- Groundwater Zinc ≥ 230 (GSI)

1:5,652

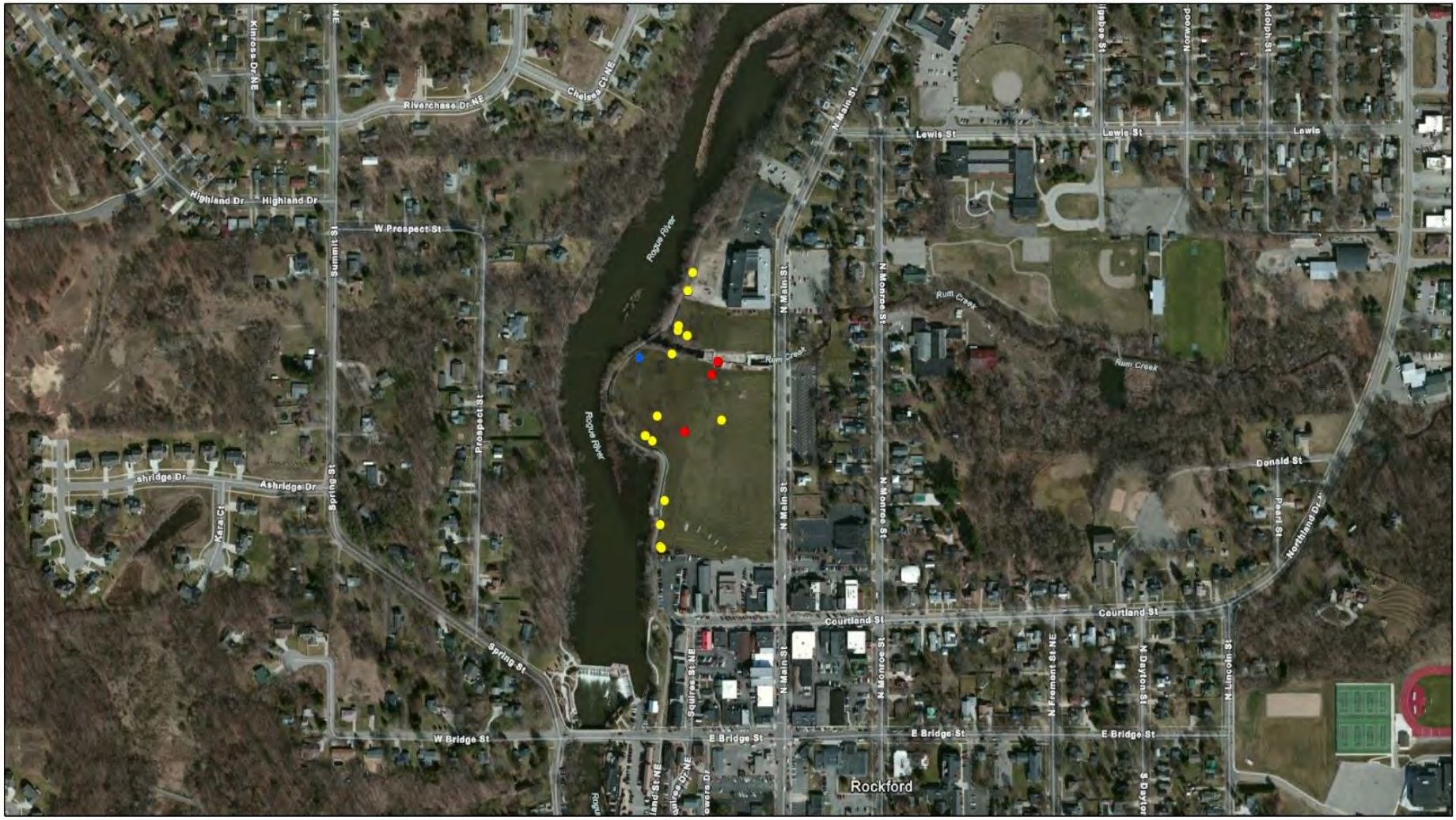
0	380	760	1,520 ft
0	115	230	460 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA |

Tannery Groundwater GSI Exceedances - Metals, SVOCs, VOCs



3/22/2019 12:41:40 PM

- Groundwater Vinyl Chloride ≥ 1.0 (GSI)
- Groundwater Phenanthrene ≥ 2 (GSI)
- Groundwater Antimony ≥ 2.0 (GSI)
- Groundwater Arsenic ≥ 10 (GSI)
- Groundwater Cadmium ≥ 2.5 (GSI)
- Groundwater Trivalent Chromium ≥ 120 (GSI)
- Groundwater Hexavalent Chromium ≥ 11 (GSI)
- Groundwater Copper ≥ 18 (GSI)
- Groundwater Manganese ≥ 1,300 (GSI)
- Groundwater Mercury ≥ 0.0013 (GSI)
- Groundwater Vanadium ≥ 27 (GSI)
- Groundwater Zinc ≥ 230 (GSI)

1:5,652

0 380 760 1,520 ft

0 115 230 460 m

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. EPA Region 5

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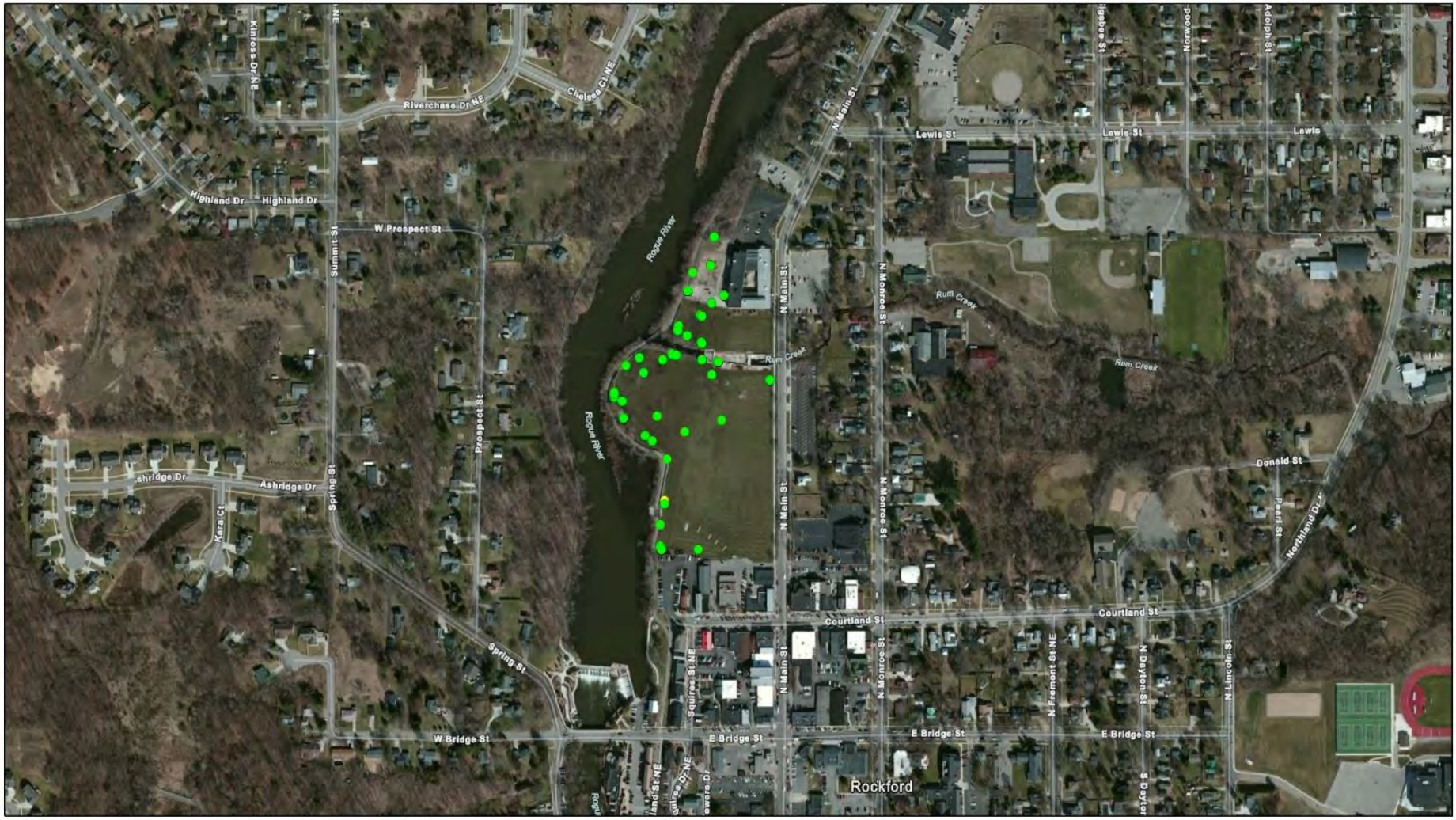
Tannery Groundwater GSI Exceedances - Metals, SVOCs, VOCs, General Chemistry



3/22/2019 12:42:57 PM

- Groundwater Acetic Acid ≥ 8,800 (GSI)
- Groundwater Ammonia Unionized ≥ 29 (GSI)
- Groundwater Chloride ≥ 50,000 (GSI)
- Groundwater Phosphorous ≥ 1000 (GSI)
- Groundwater Vinyl Chloride ≥ 1.0 (GSI)
- Groundwater Phenanthrene ≥ 2 (GSI)
- Groundwater Antimony ≥ 2.0 (GSI)
- Groundwater Arsenic ≥ 10 (GSI)
- Groundwater Cadmium ≥ 2.5 (GSI)
- Groundwater Trivalent Chromium ≥ 120 (GSI)
- Groundwater Hexavalent Chromium ≥ 11 (GSI)
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1:5,652

0	380	760	1,520 ft
0	115	230	460 m

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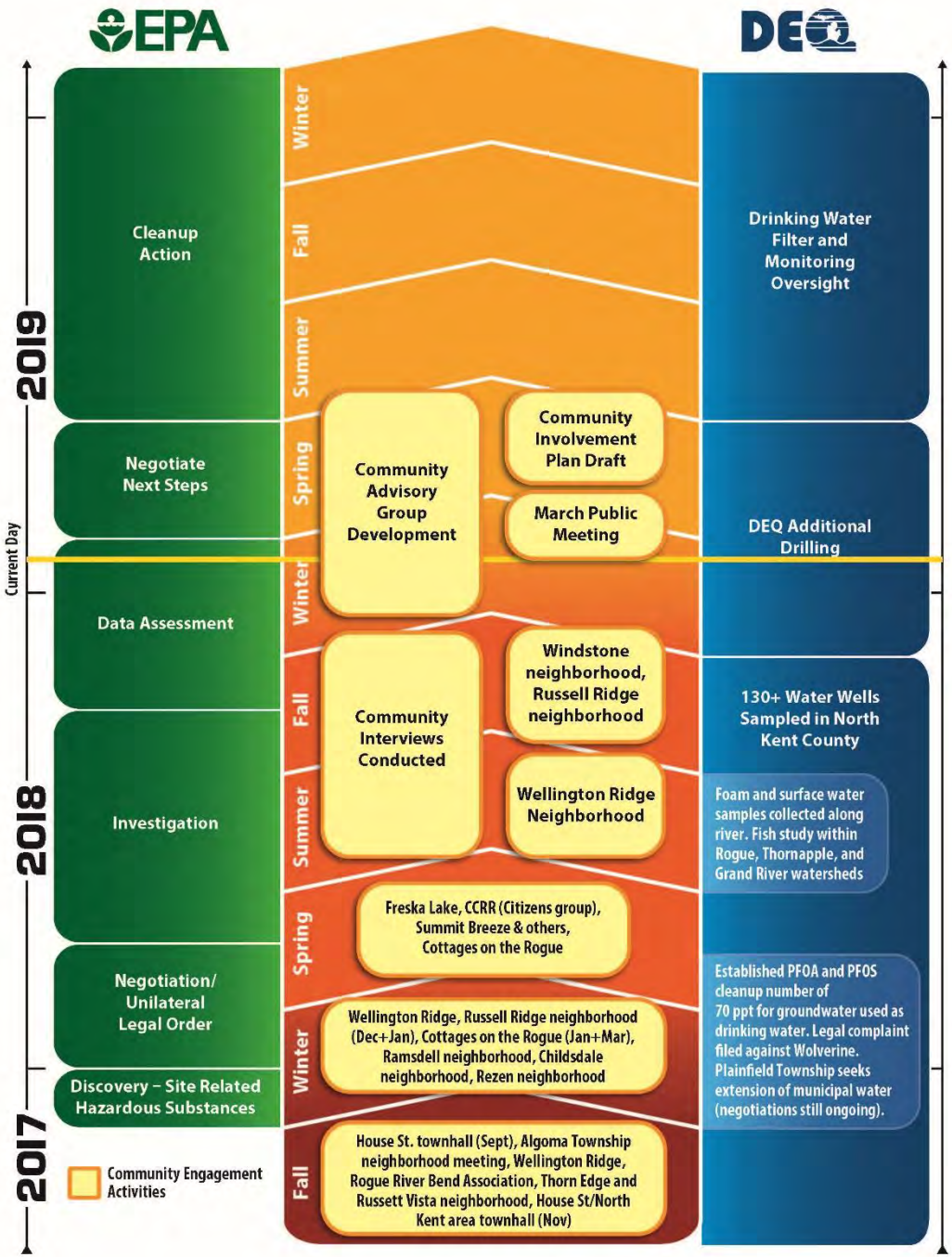
Next Steps (DEQ & EPA)

- Continued PFAS Plume Definition and Assessment
- Filter Oversight and Sampling
- Interim Remedial Actions
  - Proposed by Wolverine
  - Feasibility Analysis
- Determine Areas of Concern
- Human Health Consultations
  - House Street & Tannery Site
- Ecological Risk Assessment
  - Tannery

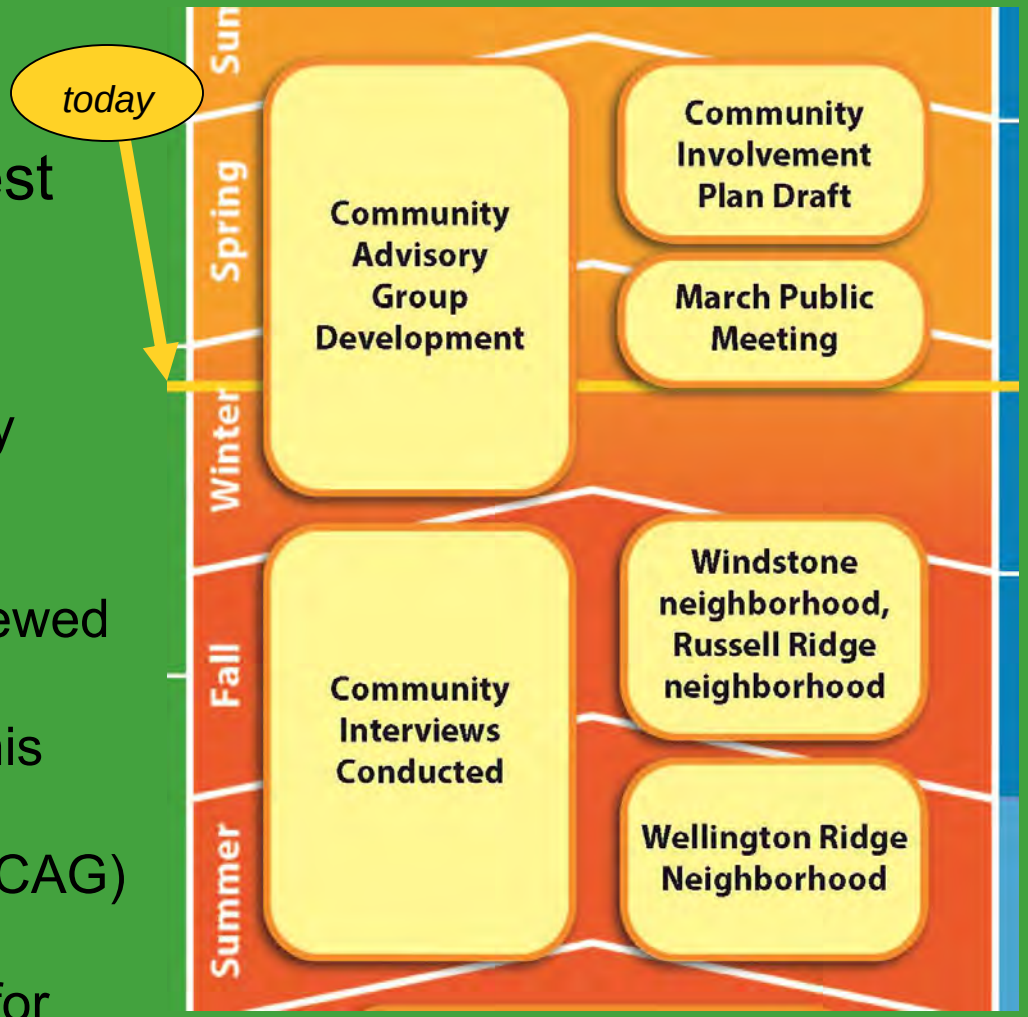
COMMUNITY ENGAGEMENT UPDATE


EPA
DEQ
2019
2018
2017
Current Day
Cleanup Action
Negotiate Next Steps
Data Assessment
Investigation
Negotiation/ Unilateral Legal Order
Discovery – Site Related Hazardous Substances
Community Engagement Activities
Winter
Fall
Summer
Spring
Winter
Fall
Summer
Spring
Winter
Fall
Community Advisory Group Development
Community Involvement Plan Draft
March Public Meeting
Community Interviews Conducted
Windstone neighborhood, Russell Ridge neighborhood
Wellington Ridge Neighborhood
Freska Lake, CCRR (Citizens group), Summit Breeze & others, Cottages on the Rogue
Wellington Ridge, Russell Ridge neighborhood (Dec+Jan), Cottages on the Rogue (Jan+Mar), Ramsdell neighborhood, Childsdale neighborhood, Rezen neighborhood
House St. townhall (Sept), Algoma Township neighborhood meeting, Wellington Ridge, Rogue River Bend Association, Thorn Edge and Russett Vista neighborhood, House St/North Kent area townhall (Nov)
Drinking Water Filter and Monitoring Oversight
DEQ Additional Drilling
130+ Water Wells Sampled in North Kent County
Foam and surface water samples collected along river. Fish study within Rogue, Thornapple, and Grand River watersheds
Established PFOA and PFOS cleanup number of 70 ppt for groundwater used as drinking water. Legal complaint filed against Wolverine. Plainfield Township seeks extension of municipal water (negotiations still ongoing).

Engagement Activities

EPA, working with DEQ, conducting long-term engagement activities to best support community needs

- Community Involvement Plan
  - Interviews with community members
  - August – November
  - Approx. 50 people interviewed
  - Gauge interest in CAG
  - Draft expected to share this Spring
- Community Advisory Group (CAG)
  - Large interest
  - EPA providing resources for community members



DRAFT available SPRING 2019

TABLE OF CONTENTS

What is a Community Advisory Group?

CAGs are informal organizations designed to communicate between:

- diverse interests in a community
- potentially responsible parties
- EPA and DEQ at a hazardous waste site.

What is a CAG?

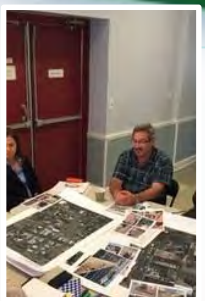
CAGs are helpful to:

- Provide community concerns and viewpoints
- Provide important feedback to inform the decision-making process.

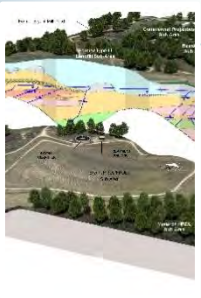
Basic CAG Facts

SIZE	• generally 15 to 25 stakeholders
FUNCTION	• provide affected and interested parties in the community a voice and opportunity to participate in the Superfund process
FREQUENCY	• meet regularly over the course of the cleanup project, most CAGs meet monthly or bi-monthly.
AFFILIATION	• CAGs are independent community organizations, they are not formal “EPA” groups.
SUPPORT	• EPA may provide administrative and facilitation support to help convene and manage the CAG
CAGs ADD TO EPA OUTREACH	• CAGs do not replace the other EPA public information and outreach activities.

What does a CAG do?



Hold regular, typically monthly, meetings.



Review technical information about site cleanup and other environmental problems.

Meet with EPA and state to learn about the site and related issues.

Work with EPA and state to solve problems.

Provide recommendations and advice.

Create a strong connection to the community. Help to communicate issues to the broader community and ensure that public input reflects the full range of community interests and concerns.

Important Aspects of CAGs

MEMBERSHIP MUST BE BALANCED. reflect all the interests and viewpoints in a community.

ALL MEETINGS ARE PUBLIC. CAGs are transparent and all meetings are open to the public.

CAG MEMBERS WORK AT IT. CAG members can spend 4 to 8 hours a month learning about the site, attending meetings, and working on crafting input.

Why a CAG?

IMPROVED ACCESS: People affected by Superfund sites have a right to know what the Agency is doing in their community and to have a say in the decision-making process.

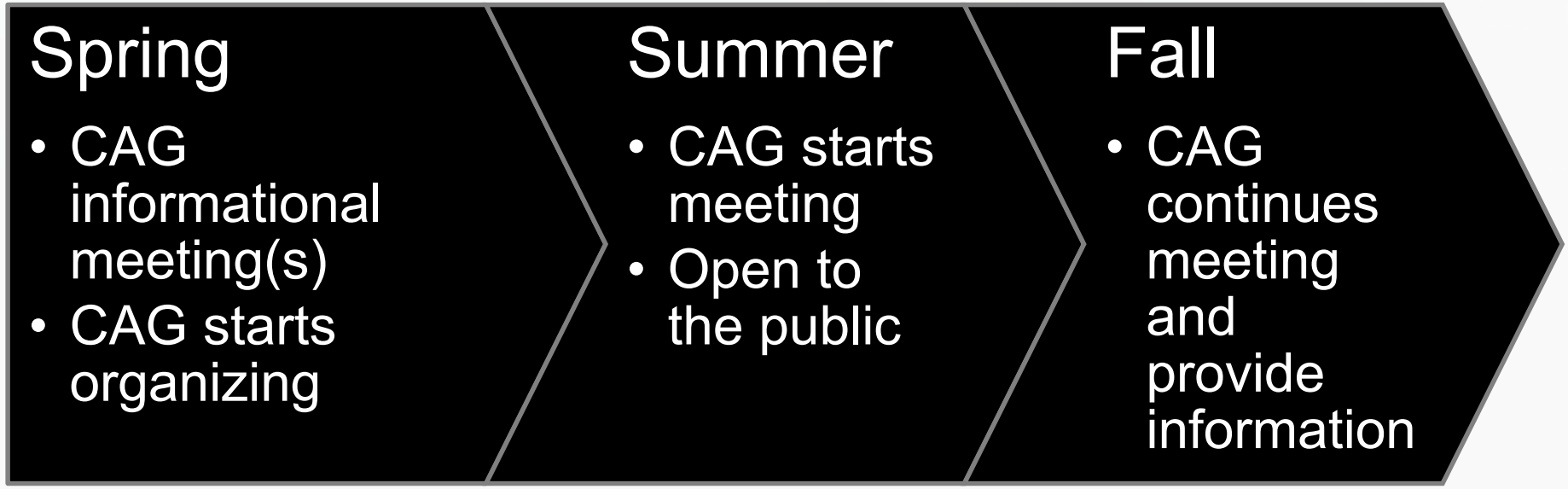
STRONGER VOICE: An effective CAG is a very powerful way to give voice to the entire community.

DEEPER UNDERSTANDING: CAGs bring people together and promote understanding of a range of perspectives.

BETTER INPUT: CAGs provide EPA in-depth community understanding and input and

COMMON GROUND: CAGs help identify where the community holds common concerns and builds consensus community recommendations.

Near-term Activities



5 Minute Break

Followed by Questions & Answers

EPA & DEQ
Town Hall Meeting Wolverine Update

Thank You!

For more information on MDEQ's Wolverine House Street investigation visit the Michigan PFAS Action Response Team (MPART) website at www.michigan.gov/belmont.

Additional information on USEPA's investigation can be found at: www.epa.gov/mi/wolverine-world-wide-tannery