

SUBJECT

Utility Corridor Analytical Results
related to the Ford Livonia Transmission Plant,
36200 Plymouth Road, Wayne County, Michigan
EGLE Site ID No.: 82002970

TO

Paul Owens, District Supervisor
EGLE Warren District Office
27700 Donald Court
Warren, Michigan 48092-2793
owensp@michigan.gov

DATE

May 5, 2021

OUR REF

30080642

DEPARTMENT

ENVIRONMENT

NAME

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COPIES TO

Ms. Beth Vens, EGLE
Mr. Brandon Alger, EGLE
Mr. Todd Walton, Ford
Mr. Chuck Pinter, Ford

On behalf of Ford Motor Company (Ford), this memo has been prepared by Arcadis of Michigan, LLC for the Livonia Transmission Plant (LTP) site (the site) to summarize the data collected thus far for the utility corridor evaluation. All work was performed under the guidance of the Michigan Department of Environment, Great Lakes, and Energy (EGLE) in compliance with the Consent Decree filed on July 27, 2017 (No: 2:1712372-GAD-RSW) and in accordance with the following approved Response Activity Plans (RespAPs):

- Response Activity Plan – Utility Corridor Evaluation Revised, dated February 11, 2020;
- Response Activity Plan – Utility Corridor Evaluation Revised Addendum, dated December 4, 2020;
- Response Activity Plan – Utility Corridor Evaluation Revised Addendum #2, dated January 27, 2021.

This memo is to document the analytical results for samples that have been collected to date onsite, offsite, and along Plymouth Road within the sanitary and storm sewers. This memo focuses on the seven constituents of concern (COCs) for the site: 1,1-dichloroethene (DCE), cis-1,2-DCE, trans-1,2-DCE, tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride (VC), and 1,4-dioxane.

Sampling Methodology

All samples were collected in accordance with the sampling methodology detailed in the approved utility corridor RespAPs for all media collected.

Grab vapor samples were collected from the sanitary and storm sewers via tubing connected to a SUMMA® canister and analyzed for site-related COCs via United States Environmental Protection Agency (USEPA) Method TO-15. All samples were submitted to Test America (formerly Eurofins), located in Folsom, California.

Grab liquid and sediment samples were collected under base flow conditions and analyzed for site-related COCs via USEPA SW-846 Method 8260B, 8260B SIM, and 8260B MI. All samples were submitted to Test America, located in North Canton, Ohio.

Onsite and Plymouth Road Sampling

On June 9, 2020 and September 15 and 16, 2020, Arcadis collected vapor samples from two (2) locations onsite (Eastern Diversion Chamber (EDC) and Western Diversion Chamber (WDC)) and two (2) locations located along Plymouth Road (SAMH-1231 and SL-2). The sample locations are shown on **Figures 1 through 4**. Results from the vapor samples collected were compared to the Restricted Nonresidential 12-hour workday exposure Site-Specific Volatilization to Indoor Air Criteria (SSVIAC) provided by EGLE on September 11, 2020 (**Table 1A**). The results of the vapor samples collected showed exceedances of the SSVIAC at two locations along Plymouth Road (SAMH-1231 and SL-2). The results from these sampling events was initially presented during a meeting between EGLE and Arcadis on October 22, 2020 and discussed in more detail in a subsequent meeting between EGLE and Arcadis on October 23, 2020.

On December 4, 2020, Arcadis submitted the RespAP – Utility Corridor Evaluation Revised Addendum to EGLE. The RespAP included five (5) additional sampling locations onsite (SAMH-1244, SAMH-1245, SAMH-1255, SAMH-1256, SAMH-1258) and one (1) additional sampling location on Plymouth Road (SL-3) in order to determine the extent of vapor impacts identified in the onsite and Plymouth Road sanitary sewer (Figures 1 through 8). Grab vapor samples were collected from all ten locations during the December 15 and 16, 2020 sampling event. The results of the of the vapor samples collected showed exceedances of the Nonresidential 12-hour workday exposure SSVIAC from both onsite and Plymouth Road sampling locations (see **Table 1A and 1B**).

On January 15, 2021, EGLE, Ford, and Arcadis held a meeting to discuss the results from the December 2020 vapor sampling event. During the meeting, EGLE requested that additional locations be sampled in an effort to delineate the vapor impacts that were identified in the sanitary sewer onsite and along Plymouth Road.

On January 27, 2021, Arcadis submitted the RespAP – Utility Corridor Evaluation Revised Addendum #2. The RespAP included two (2) additional locations onsite (SAMH-1248 and SAMH-1259) and two (2) additional locations on Plymouth Road (SL-4 and SL-5) (**Figures 1 through 8**), as well as proposed cleaning and closed circuit televised (CCTV) of the sanitary sewers onsite and on Plymouth Road up to SL-2. From March 8 through 17, 2021, Arcadis oversaw Michels Corporation clean and CCTV the sanitary sewers and manholes onsite and along Plymouth Road up to SL-2. A subsequent post cleaning vapor sampling event was completed on March 22 through March 30, 2021 that included all fourteen (14) locations onsite and along Plymouth Road. The results of the vapor samples collected showed exceedances of the Nonresidential 12-hour workday exposure SSVIAC from both onsite and Plymouth Road sampling locations as summarized in **Table 1A and 1B**.

On April 19 and 20, 2021, Arcadis collected vapor samples from all fourteen (14) locations onsite and along Plymouth Road (**Figures 1 through 8**). Five (5) liquid samples were also collected from the locations along Plymouth Road (MH-1231, SL-2, SL-3, SL-4, and SL-5) (Figures 9 and 10). The results of the vapor samples collected during this event (see **Tables 1A and 1B**) showed exceedances of the Nonresidential 12-hour workday exposure SSVIAC from both onsite and Plymouth Road sampling locations. Results from the liquid samples collected were compared to the EGLE Groundwater Surface Water Interface (GSI) Protection Criteria (updated June 25, 2018) (**Table 1C**) and showed exceedances of the GSI criteria. On April 21, 2021, EGLE, Ford and Arcadis discussed the results from the post cleaning vapor sampling event completed in March 2021. On April 30, 2021, EGLE, Ford, and Arcadis discussed the results from the April 2021 sampling event. During the meeting on April 30, 2021, EGLE requested that a memo be submitted to provide the full analytical results for review.

Results for all sampling locations are provided in **Tables 1A, 1B, and 1C** and the sample locations are presented on **Figures 1 through 10**. No additional sampling events are currently scheduled.

Offsite – Belden Court and Alden Village

Arcadis completed sampling events of the offsite sanitary and storm sewers located along Belden Court and in Alden Village in June 2020, September 2020, December 2020, and March 2021. A total of seventeen (17) locations were sampled for vapor in all four sampling events (**Figures 5 through 8**). Liquid and sediment samples were also collected at locations offsite, where present. Liquid was present and sampled in thirteen (13) locations during the June 2020 event, eight (8) locations during the September 2020 event, and eleven (11) locations during each of the December 2020 and March 2021 events (**Figure 10**). Sediment was present and sampled in one (1) location during the June 2020 event and one (1) location during the December 2020 event.

Results from the vapor samples collected were compared to the SSVIAC. Vapor sample results collected from locations along Belden Court were compared to the Restricted Nonresidential 12-hour workday exposure SSVIAC and vapor sample results collected from locations within Alden Village were compared to the unrestricted residential SSVIAC. Vapor sample results showed exceedances of the respective SSVIAC in vapor samples collected during the June 2020, September 2020, and March 2021 sampling events (**Table 2**). However, results above the SSVIAC in each event were determined to be unrelated to the vapor impacts identified along Plymouth Road. Arcadis reviewed historical maps and confirmed in the field that no businesses on Belden Court or residential properties are connected directly to the Plymouth Road sanitary sewer until the Stark and Plymouth intersection.

Results from the liquid and sediment samples collected were compared to the GSI criteria. Results from all liquid and sediment samples collected offsite along Belden Court and in Alden Village are below the GSI criteria (**Tables 1C and 3**).

Results for all offsite sampling locations are provided in **Tables 1B, 1C, 2, and 3** and the sample locations are provided on **Figures 5 through 8 and Figure 10**. No additional sampling events are planned along Belden Road or the sewers that reside in Alden Village.

Closing

All samples have been collected in accordance with the RespAPs approved by EGLE and the vapor data has been validated for quality assurance. Ford and Arcadis will continue to have discussions with EGLE to determine the next steps. If you have questions, please contact Kris Hinskey at 269-579-5402.

Figures

- Figure 1 – Onsite Vapor Results Cis-1,2-Dichloroethene
- Figure 2 – Onsite Vapor Results Trans-1,2,dichloroethane
- Figure 3 – Onsite Vapor Results Trichloroethene
- Figure 4 – Onsite Vapor Results Vinyl Chloride
- Figure 5 – Offsite Vapor Results 1,4-Dioxane
- Figure 6 – Offsite Vapor Results Cis-1,2-Dichloroethene
- Figure 7 – Offsite Vapor Results Trichloroethene
- Figure 8 – Offsite Vapor Results Vinyl Chloride
- Figure 9 – Onsite Liquid Results Vinyl Chloride
- Figure 10 – Offsite Liquid Results Vinyl Chloride

Tables

- Table 1A – Utility Corridor Onsite Vapor Results
- Table 1B – Utility Corridor Offsite Non-residential Vapor Results
- Table 1C – Utility Corridor Liquid Results
- Table 2 – Utility Corridor Offsite Residential Vapor Results
- Table 3 – Utility Corridor Sediment Results

Figures



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LEGEND

- ON-SITE MANHOLE
CIS-1,2-DICHLOROETHENE ≤ 25 µg/m³
- ON-SITE MANHOLE
CIS-1,2-DICHLOROETHENE > 25 µg/m³
- BLUE/BOLD TEXT** RESULT EXCEEDS THE EGLE SSVIAC
- SURVEY POINTS**
- STORM CATCH BASIN
- CHAMBER
- SANITARY MANHOLE
- SANITARY MANHOLE / COULD NOT OPEN
- STORM MANHOLE
- PROPERTY BOUNDARY
- FORD PROPERTY BOUNDARY
- ▲ FLOW DIRECTION
- STORM WATER LINE
- SANITARY SEWER LINE

NOTES:

FIGURE SHOWS DATA COLLECTED TO DATE. FULL SET OF DATA CAN BE FOUND IN THE CORRESPONDING TABLE.

"ND", "<" – INDICATES THE VALUE IS BELOW THE LABORATORY REPORTING LIMIT

> – GREATER THAN

EDC = EASTERN DIVERSION CHAMBER

WDC = WESTERN DIVERSION CHAMBER

EGLE = DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY

SAMH = SANITARY MANHOLE

SL = SAMPLING LOCATION

[] = DUPLICATE SAMPLE RESULT

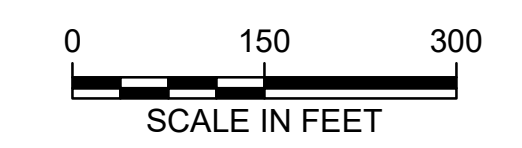
J = ESTIMATED RESULT

VAPOR RESULTS REPORTED IN MICROGRAMS PER CUBIC METER (µg/m³). ANALYTICAL METHOD: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) TO-15.

ON-SITE RESULTS ARE COMPARED TO THE EGLE SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA (SSVIAC) RESTRICTED NONRESIDENTIAL 12-HOUR WORKDAY EXPOSURE FOR CIS-1,2-DICHLOROETHENE OF 25 µg/m³.

A BLUE DOT INDICATES RESULTS EXCEED THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT.

BLUE BOX INDICATES RESULT EXCEEDS THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT



CITY: Novi, DIV: ENV, DE: MG, PIC: R. ELLIS, PM: K. HINSKEY, PROJECT NUMBER: 30080642, COORDINATE SYSTEM: NAD, 1983, StatePlane Michigan South FIPS 2113, Feet Intl, T1_ENV\Novi\Brighton_MilFord\GIS\Subarea\GEO\10_2021\Utility_Corridor\April_2021\Figure 1_On-Site_Vapor_cis-1,2-dichloroethene.mxd PLOTTED: 5/5/2021 12:15:10 PM BY: MS/Miller



WDC
6/9/2020: ND (< 5.2 µg/m³)
9/16/2020: ND (< 4.8 µg/m³)
12/15/2020: ND (< 5.0 µg/m³)
3/23/2021: ND (< 3.9 µg/m³)
4/20/2021: ND (< 4.0 µg/m³)

SAMH-1245
12/15/2020: 150 µg/m³
3/22/2021: 2.2 J µg/m³
4/19/2021: ND (< 4.3 µg/m³)

SAMH-1231
6/9/2020: 25,000 µg/m³
9/16/2020: 42,000 µg/m³
12/15/2020: 37,000 µg/m³
3/22/2021: 46,000 µg/m³
4/19/2021: 27,000 µg/m³

SAMH-1248
3/22/2021: 6.0 [6.8] µg/m³
4/19/2021: 5.8 µg/m³

SAMH-1256
12/16/2020: 150 µg/m³
3/22/2021: 7,400 µg/m³
4/19/2021: 30,000 µg/m³

SAMH-1258
12/16/2020: 860 µg/m³
3/22/2021: 43 µg/m³
4/19/2021: 260 µg/m³

SAMH-1255
12/16/2020: 510 µg/m³
3/23/2021: 810 µg/m³
4/20/2021: 260 [250] µg/m³

SAMH-1259
3/23/2021: ND (< 4.3 µg/m³)
4/19/2021: 5.4 µg/m³

EDC
6/9/2020: ND (< 5.5 µg/m³)
9/16/2020: ND (< 22 µg/m³)
12/15/2020: ND (< 4.6 µg/m³)
3/23/2021: 4.6 µg/m³
4/20/2021: 3.3 J µg/m³

SL-2
6/9/2020: 1,900 µg/m³
9/15/2020: 4,600 µg/m³
12/15/2020: 6,800 µg/m³
3/30/2021: 89 µg/m³
4/20/2021: 2,200 µg/m³

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

**ON-SITE VAPOR RESULTS
CIS-1,2-DICHLOROETHENE**





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LEGEND

- ON-SITE MANHOLE
TRANS-1,2-DICHLOROETHENE ≤ 250 µg/m³
- ON-SITE MANHOLE
TRANS-1,2-DICHLOROETHENE > 250 µg/m³
- BLUE/BOLD TEXT** RESULT EXCEEDS THE EGLE SSVIAC
- TEXT** SURVEY POINTS
- STORM CATCH BASIN
- CHAMBER
- SANITARY MANHOLE
- SANITARY MANHOLE / COULD NOT OPEN
- STORM MANHOLE
- PROPERTY BOUNDARY
- FORD PROPERTY BOUNDARY
- ▲ FLOW DIRECTION
- STORM WATER LINE
- SANITARY SEWER LINE

NOTES:

FIGURE SHOWS DATA COLLECTED TO DATE. FULL SET OF DATA CAN BE FOUND IN THE CORRESPONDING TABLE.

"ND", "<" - INDICATES THE VALUE IS BELOW THE LABORATORY REPORTING LIMIT

> - GREATER THAN

J = ESTIMATED RESULT

EDC = EASTERN DIVERSION CHAMBER

WDC = WESTERN DIVERSION CHAMBER

EGLE = DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY

SAMH = SANITARY MANHOLE

SL = SAMPLING LOCATION

[] = DUPLICATE SAMPLE

VAPOR RESULTS REPORTED IN MICROGRAMS PER CUBIC METER (µg/m³). ANALYTICAL METHOD: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) TO-15.

ON-SITE RESULTS ARE COMPARED TO THE EGLE SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA (SSVIAC) RESTRICTED NONRESIDENTIAL 12-HOUR WORKDAY EXPOSURE FOR TRANS-1,2-DICHLOROETHENE OF 250 µg/m³.

A BLUE DOT INDICATES RESULTS EXCEED THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT.

BLUE BOX INDICATES RESULT EXCEEDS THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT



CITY: Novi; DIV: ENV; DE: MG; PIC: R. ELLIS; PM: K. HINSKEY; PROJECT NUMBER: 30080642; COORDINATE SYSTEM: NAD 1983; StatePlane Michigan South FIPS 2113; Feet; Intl; TI: ENV\Novi\Brighton_Milford\GIS\Docs\GEC\10_2021\Utility_Corridor\April_2021\Figure 2_On-Site_Vapor_Trans-1,2-Dichloroethene.mxd; PLOTTED: 5/5/2021 12:22:56 PM; BY: MSMiller



WDC
6/9/2020: ND (< 5.2 µg/m³)
9/16/2020: ND (< 4.8 µg/m³)
12/15/2020: ND (< 5.0 µg/m³)
3/23/2021: ND (< 3.9 µg/m³)
4/20/2021: ND (< 4.0 µg/m³)

SAMH-1248
3/22/2021: ND (< 4.4 [**< 4.3**] µg/m³)
4/19/2021: ND (< 4.6 µg/m³)

SAMH-1245
12/15/2020: 2.6 J µg/m³
3/22/2021: ND (< 4.2 µg/m³)
4/19/2021: ND (< 4.3 µg/m³)

SAMH-1256
12/16/2020: ND (< 5.0 µg/m³)
3/22/2021: 63 µg/m³
4/19/2021: **270 µg/m³**

SAMH-1244
12/15/2020: 3.7 J µg/m³
3/22/2021: 20 µg/m³
4/19/2021: 180 µg/m³

SAMH-1258
12/16/2020: 3.7 J µg/m³
3/22/2021: ND (< 4.1 µg/m³)
4/19/2021: 1.4 J µg/m³

SAMH-1255
12/16/2020: 20 J µg/m³
3/23/2021: 37 J µg/m³
4/20/2021: 8.6 [6.9 J] µg/m³

SAMH-1259
3/23/2021: ND (< 4.3 µg/m³)
4/19/2021: ND (< 4.6 µg/m³)

SAMH-1231
6/9/2020: **270 µg/m³**
9/16/2020: **440 µg/m³**
12/15/2020: 260 µg/m³
3/23/2021: **400 µg/m³**
4/19/2021: 180 µg/m³

EDC
6/9/2020: ND (< 5.5 µg/m³)
9/16/2020: ND (< 22 µg/m³)
12/15/2020: ND (< 4.6 µg/m³)
3/23/2021: ND (< 4.0 µg/m³)
4/20/2021: 1.0 J µg/m³

SL-2
6/9/2020: 29 µg/m³
9/15/2020: 48 µg/m³
12/15/2020: 44 µg/m³
3/30/2021: ND (< 4.2 µg/m³)
4/20/2021: 17 µg/m³

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

**ON-SITE VAPOR RESULTS
TRANS-1,2-DICHLOROETHENE**

ARCADIS

FIGURE
2



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LEGEND

- ON-SITE MANHOLE TRICHLOROETHENE ≤ 4.0 µg/m³
- ON-SITE MANHOLE TRICHLOROETHENE > 4.0 µg/m³
- BLUE/BOLD TEXT** RESULT EXCEEDS THE EGLE SSVIAC
- SURVEY POINTS**
- STORM CATCH BASIN
- CHAMBER
- SANITARY MANHOLE
- SANITARY MANHOLE / COULD NOT OPEN
- STORM MANHOLE
- PROPERTY BOUNDARY
- FORD PROPERTY BOUNDARY
- ▲ FLOW DIRECTION
- STORM WATER LINE
- SANITARY SEWER LINE

NOTES:

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WDC = WESTERN DIVERSION CHAMBER

EGLE = DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY

SAMH = SANITARY MANHOLE

SL = SAMPLING LOCATION

[] = DUPLICATE SAMPLE RESULT

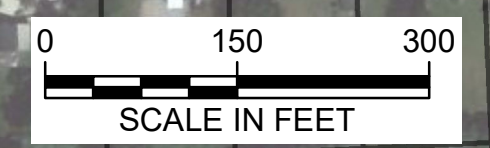
J = ESTIMATED RESULT

VAPOR RESULTS REPORTED IN MICROGRAMS PER CUBIC METER (µg/m³). ANALYTICAL METHOD: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) TO-15.

ON-SITE RESULTS ARE COMPARED TO THE EGLE SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA (SSVIAC) RESTRICTED NONRESIDENTIAL 12-HOUR WORKDAY EXPOSURE FOR TRICHLOROETHENE OF 4.0 µg/m³.

A BLUE DOT INDICATES RESULTS EXCEED THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT.

BLUE BOX INDICATES RESULT EXCEEDS THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT



CITY: Novi, DIV: ENV, DE: MG, PIC: R. ELLIS, PM: K. HINSKEY, PROJECT NUMBER: 30080642, COORDINATE SYSTEM: NAD, 1983, StatePlane Michigan South, FIPS: 2113, Feet Intl, T1_ENV\Novi\Brighton_Milford\GIS\docs\GEC10_2021\Figure 3_On-Site_Vapor_Trichloroethene.mxd PLOTTED: 5/6/2021 10:45:45 AM BY: MSMiller



FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

**ON-SITE VAPOR RESULTS
TRICHLOROETHENE**



FIGURE
3

WDC
6/9/2020: 3.5 J µg/m³
9/16/2020: 17 µg/m³
12/15/2020: ND (< 6.8 µg/m³)
3/23/2021: 5.6 µg/m³
4/20/2021: ND (< 5.5 µg/m³)

SAMH-1248
3/22/2021: 12 [10] µg/m³
4/19/2021: 2.2 J µg/m³

SAMH-1245
12/15/2020: 120 µg/m³
3/22/2021: 2.0 J µg/m³
4/19/2021: ND (< 5.9 µg/m³)

SAMH-1244
12/15/2020: 280 µg/m³
3/22/2021: 1,100 µg/m³
4/19/2021: 11,000 µg/m³

SAMH-1256
12/16/2020: 15 µg/m³
3/22/2021: 2,100 µg/m³
4/19/2021: 15,000 µg/m³

SAMH-1255
12/16/2020: 83 µg/m³
3/23/2021: 140 µg/m³
4/20/2021: 9.3 [9.1 J] µg/m³

SAMH-1258
12/16/2020: 70 µg/m³
3/22/2021: 3.4 J µg/m³
4/19/2020: 20 µg/m³

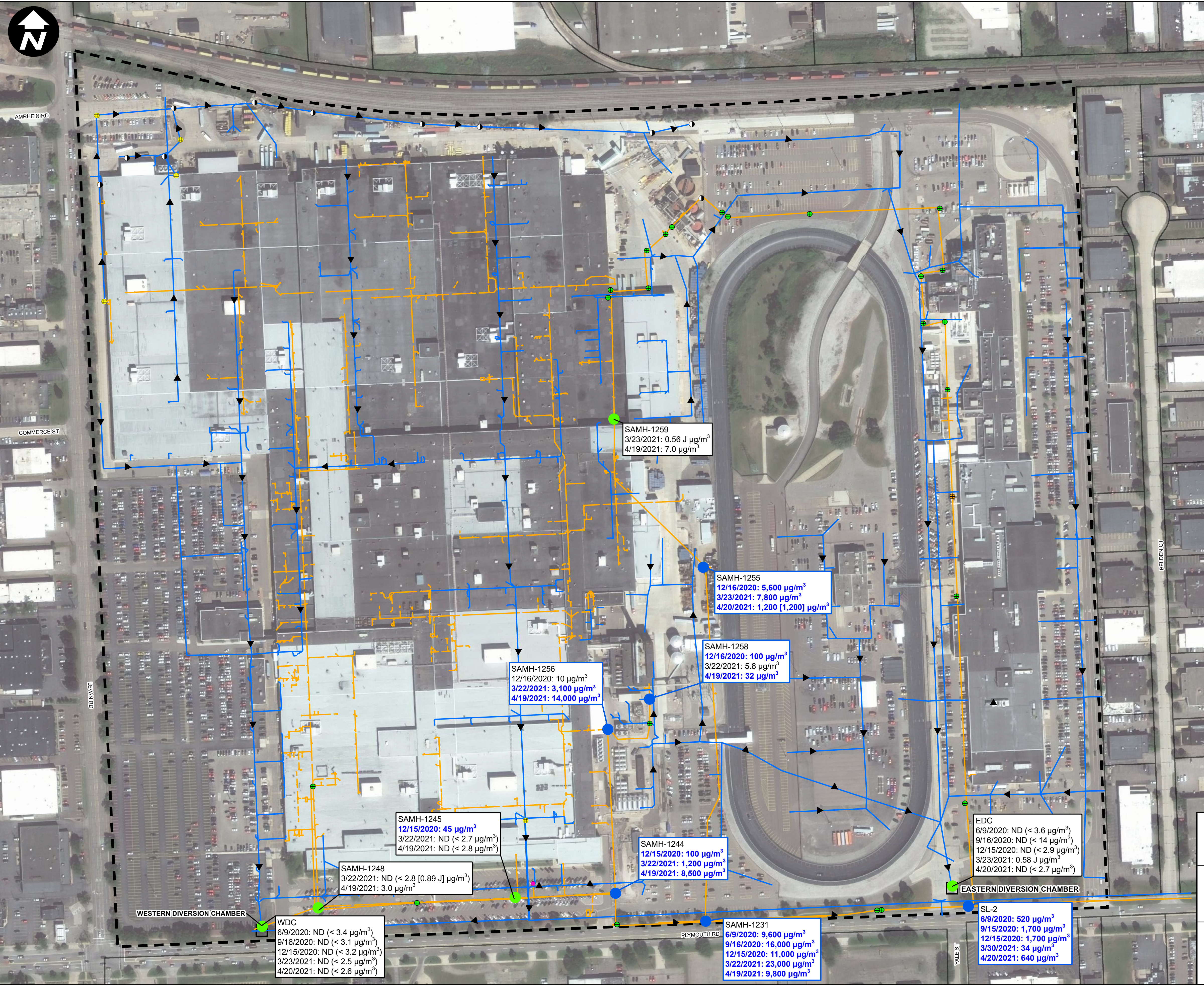
SAMH-1259
3/23/2021: 1.7 J µg/m³
4/19/2021: 7.0 µg/m³

SAMH-1231
6/9/2020: 15,000 µg/m³
9/16/2020: 18,000 µg/m³
12/15/2020: 14,000 µg/m³
3/22/2021: 19,000 µg/m³
4/19/2021: 10,000 µg/m³

EDC
6/9/2020: 16 µg/m³
9/16/2020: ND (< 29 µg/m³)
12/15/2020: ND (< 6.2 µg/m³)
3/23/2021: 7.5 µg/m³
4/20/2021: 19 µg/m³

SL-2
6/9/2020: 1,500 µg/m³
9/15/2020: 2,000 µg/m³
12/15/2020: 2,200 µg/m³
3/30/2021: 52 µg/m³
4/20/2020: 880 µg/m³

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LEGEND

- ON-SITE MANHOLE VINYL CHLORIDE $\leq 27 \mu\text{g}/\text{m}^3$
- ON-SITE MANHOLE VINYL CHLORIDE $> 27 \mu\text{g}/\text{m}^3$
- BLUE/BOLD TEXT** RESULT EXCEEDS THE EGLE SSVIAC

SURVEY POINTS

- STORM CATCH BASIN
- CHAMBER
- SANITARY MANHOLE
- SANITARY MANHOLE / COULD NOT OPEN
- STORM MANHOLE

- PROPERTY BOUNDARY
- FORD PROPERTY BOUNDARY
- ▲ FLOW DIRECTION
- STORM WATER LINE
- SANITARY SEWER LINE

NOTES:

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WDC = WESTERN DIVERSION CHAMBER

EGLE = DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY
SAMH = SANITARY MANHOLE
SL = SAMPLING LOCATION
[] = DUPLICATE SAMPLE RESULT
J = ESTIMATED RESULT

VAPOR RESULTS REPORTED IN MICROGRAMS PER CUBIC METER ($\mu\text{g}/\text{m}^3$). ANALYTICAL METHOD: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) TO-15.

ON-SITE RESULTS ARE COMPARED TO THE EGLE SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA (SSVIAC) RESTRICTED NONRESIDENTIAL 12-HOUR WORKDAY EXPOSURE FOR VINYL CHLORIDE OF $27 \mu\text{g}/\text{m}^3$.

A BLUE DOT INDICATES RESULTS EXCEED THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT.

BLUE BOX INDICATES RESULT EXCEEDS THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT



CITY: Novi; DIV: ENV; DE: MG; PIC: R. ELLIS; PM: K. HINSKEY; PROJECT NUMBER: 30080642; COORDINATE SYSTEM: NAD 1983; StatePlane Michigan South FIPS 2113; Feet Intl; T: ENV\Novi\Brighton_MifFordLivonia\GIS\docs\GEC10_2021\Figure 4_On-Site_Vapor_Vinyl Chloride.mxd; PLOTTED: 5/5/2021 12:24:21 PM; BY: MSMiller

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

ON-SITE VAPOR RESULTS VINYL CHLORIDE



FIGURE
4

WDC
6/9/2020: ND ($< 3.4 \mu\text{g}/\text{m}^3$)
9/16/2020: ND ($< 3.1 \mu\text{g}/\text{m}^3$)
12/15/2020: ND ($< 3.2 \mu\text{g}/\text{m}^3$)
3/23/2021: ND ($< 2.5 \mu\text{g}/\text{m}^3$)
4/20/2021: ND ($< 2.6 \mu\text{g}/\text{m}^3$)

SAMH-1248
3/22/2021: ND ($< 2.8 [0.89 \text{ J}] \mu\text{g}/\text{m}^3$)
4/19/2021: $3.0 \mu\text{g}/\text{m}^3$

SAMH-1245
12/15/2020: $45 \mu\text{g}/\text{m}^3$
3/22/2021: ND ($< 2.7 \mu\text{g}/\text{m}^3$)
4/19/2021: ND ($< 2.8 \mu\text{g}/\text{m}^3$)

SAMH-1256
12/16/2020: $10 \mu\text{g}/\text{m}^3$
3/22/2021: $3,100 \mu\text{g}/\text{m}^3$
4/19/2021: $14,000 \mu\text{g}/\text{m}^3$

SAMH-1244
12/15/2020: $100 \mu\text{g}/\text{m}^3$
3/22/2021: $1,200 \mu\text{g}/\text{m}^3$
4/19/2021: $8,500 \mu\text{g}/\text{m}^3$

SAMH-1258
12/16/2020: $100 \mu\text{g}/\text{m}^3$
3/22/2021: $5.8 \mu\text{g}/\text{m}^3$
4/19/2021: $32 \mu\text{g}/\text{m}^3$

SAMH-1255
12/16/2020: $5,600 \mu\text{g}/\text{m}^3$
3/23/2021: $7,800 \mu\text{g}/\text{m}^3$
4/20/2021: $1,200 [1,200] \mu\text{g}/\text{m}^3$

SAMH-1259
3/23/2021: $0.56 \text{ J } \mu\text{g}/\text{m}^3$
4/19/2021: $7.0 \mu\text{g}/\text{m}^3$

SAMH-1231
6/9/2020: $9,600 \mu\text{g}/\text{m}^3$
9/16/2020: $16,000 \mu\text{g}/\text{m}^3$
12/15/2020: $11,000 \mu\text{g}/\text{m}^3$
3/22/2021: $23,000 \mu\text{g}/\text{m}^3$
4/19/2021: $9,800 \mu\text{g}/\text{m}^3$

EDC
6/9/2020: ND ($< 3.6 \mu\text{g}/\text{m}^3$)
9/16/2020: ND ($< 14 \mu\text{g}/\text{m}^3$)
12/15/2020: ND ($< 2.9 \mu\text{g}/\text{m}^3$)
3/23/2021: $0.58 \text{ J } \mu\text{g}/\text{m}^3$
4/20/2021: ND ($< 2.7 \mu\text{g}/\text{m}^3$)

SL-2
6/9/2020: $520 \mu\text{g}/\text{m}^3$
9/15/2020: $1,700 \mu\text{g}/\text{m}^3$
12/15/2020: $1,700 \mu\text{g}/\text{m}^3$
3/30/2021: $34 \mu\text{g}/\text{m}^3$
4/20/2021: $640 \mu\text{g}/\text{m}^3$



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LEGEND

● OFF-SITE MANHOLE 1,4-DIOXANE > 5.1 µg/m ³	— SANITARY SEWER LINE
● OFF-SITE MANHOLE 1,4-DIOXANE ≤ 5.1 µg/m ³	— STORM WATER LINE
BLUE/BOLD TEXT RESULT EXCEEDS THE EGLE SSVIAC	VC - GROUNDWATER
● SURVEY POINTS	■ 1 - 2 µg/L
● STORM CATCH BASIN	■ 2 - 10 µg/L
● SANITARY MANHOLE	■ 10 - 100 µg/L
● STORM MANHOLE	□ PROPERTY BOUNDARY
▲ FLOW DIRECTION	□ FORD PROPERTY BOUNDARY

NOTES:

FIGURE SHOWS DATA COLLECTED TO DATE. FULL SET OF DATA CAN BE FOUND IN THE CORRESPONDING TABLE.

"ND", "<" - INDICATES THE VALUE IS BELOW THE LABORATORY REPORTING LIMIT

> - GREATER THAN

J = ESTIMATED RESULT

THE VC GROUNDWATER CONCENTRATION PLUME SHOWN HAS BEEN MODELED WITH EARTH VOLUMETRIC STUDIOS. THE MODEL USES ACTUAL POINTS OF DATA TO GENERATE A VISUAL WHICH REPRESENTS POTENTIAL CONCENTRATIONS BETWEEN THE ACTUAL POINTS OF DATA.

EGLE = DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY

OFF-SITE RESIDENTIAL RESULTS ARE COMPARED TO THE EGLE SSVIAC UNRESTRICTED RESIDENTIAL PATHWAY FOR 1,4-DIOXANE OF 5.1(µg/m³).

BELDEN COURT AND ROSATI AVENUE RESULTS ARE COMPARED TO THE EGLE SSVIAC RESTRICTED NONRESIDENTIAL 12-HOUR WORKDAY EXPOSURE FOR 1,4-DIOXANE OF 24(µg/m³).

VAPOR RESULTS REPORTED IN MICROGRAMS PER CUBIC METER (µg/m³). ANALYTICAL METHOD: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) TO-15.

"[]" = DUPLICATE SAMPLE RESULT

SAMH = SANITARY MANHOLE

STMH = STORM MANHOLE

VC = VINYL CHLORIDE

µg/L = MICROGRAMS PER LITER

SSVIAC = SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA

BLUE BOX INDICATES RESULT EXCEEDS THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT

CITY: Novi, DIV: ENV, DE: MG, PIC: R. ELLIS, PM: K. HINSKEY, PROJECT NUMBER: 30050315, COORDINATE SYSTEM: NAD, 1983, StatePlane Michigan South FIPS 2113, Feet Intl, T: ENV\Novi\Brighton_MilFord\GIS\GISData\GEC10_2021\Figure 5_Off-Site_Vapor_1-4-Dioxane.mxd, PLOTTED: 5/5/2021 1:56:52 PM, BY: MSMiller



SAMH-1082
6/15/2020: ND (< 19 µg/m³)
9/18/2020: ND (< 17 µg/m³)
12/17/2020: ND (< 18 µg/m³)
3/24/2021: ND (< 16 µg/m³)

STMH-1088
6/9/2020: ND (< 21 µg/m³)
9/16/2020: ND (< 18 µg/m³)
12/15/2020: ND (< 17 µg/m³)
3/23/2021: ND (< 15 µg/m³)

STMH-1066
6/9/2020: ND (< 21 µg/m³)
9/16/2020: ND (< 17 µg/m³)
12/15/2020: ND (< 18 µg/m³)
3/23/2021: ND (< 15 µg/m³)

SAMH-1067
6/16/2020: ND (< 19 µg/m³)
9/18/2020: ND (< 16 µg/m³)
12/17/2020: ND (< 18 µg/m³)
3/24/2021: ND (< 17 µg/m³)

SAMH-1043
6/16/2020: ND (< 20 µg/m³)
9/18/2020: ND (< 18 µg/m³)
12/17/2020: ND (< 18 µg/m³)
3/24/2021: ND (< 16 µg/m³)

STMH-1041
6/9/2020: ND (< 21 µg/m³)
9/15/2020: ND (< 18 [17] µg/m³)
12/15/2020: ND (< 17 µg/m³)
3/23/2021: ND (< 16 µg/m³)

SAMH-1020
6/16/2020: ND (< 20 µg/m³)
9/18/2020: ND (< 18 µg/m³)
12/17/2020: ND (< 17 µg/m³)
3/24/2021: ND (< 16 µg/m³)

STMH-1001
6/10/2020: ND (< 21 µg/m³)
9/15/2020: ND (< 18 µg/m³)
12/16/2020: ND (< 18 µg/m³)
3/23/2021: ND (< 15 µg/m³)

SL-3
12/16/2020: ND (< 42 µg/m³)
3/22/2021: ND (< 24 µg/m³)
4/19/2021: ND (< 15 [58] µg/m³)

SAMH-1122
6/10/2020: ND (< 19 µg/m³)
9/16/2020: ND (< 63 µg/m³)
12/17/2020: ND (< 18 µg/m³)
3/24/2021: ND (< 15 µg/m³)

SAMH-1116
6/15/2020: ND (< 18 µg/m³)
9/17/2020: ND (< 20 µg/m³)
12/17/2020: ND (< 18 µg/m³)
3/23/2021: ND (< 15 µg/m³)

SAMH-1113
6/15/2020: ND (< 21 µg/m³)
9/17/2020: ND (< 18 µg/m³)
12/16/2020: ND (< 18 µg/m³)
3/23/2021: ND (< 15 µg/m³)

SAMH-1096
6/15/2020: ND (< 21 µg/m³)
9/18/2020: ND (< 18 µg/m³)
12/16/2020: ND (< 17 [17] µg/m³)
3/22/2021: ND (< 16 µg/m³)

SAMH-1123
6/15/2020: ND (< 21 µg/m³)
9/17/2020: ND (< 19 µg/m³)
12/17/2020: ND (< 18 µg/m³)
3/23/2021: ND (< 15 µg/m³)

SL-4
3/22/2021: ND (< 120 µg/m³)
4/19/2021: ND (< 100 µg/m³)

SL-5
3/23/2021: ND (< 14 µg/m³)
4/20/2021: ND (< 15 µg/m³)

STMH-1171
6/10/2020: ND (< 20 µg/m³)
9/16/2020: ND (< 18 µg/m³)
12/15/2020: ND (< 17 µg/m³)
3/23/2021: ND (< 16 µg/m³)

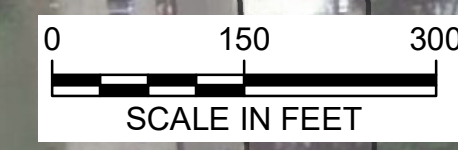
STMH-1219
6/16/2020: ND (< 19 µg/m³)
9/16/2020: **41 J µg/m³**
12/16/2020: ND (< 16 µg/m³)
3/23/2021: **7.3 J [ND (< 15) µg/m³]**

STMH-1210
6/10/2020: ND (< 22 [19] µg/m³)
9/16/2020: ND (< 18 µg/m³)
12/16/2020: ND (< 18 µg/m³)
3/23/2021: ND (< 15 µg/m³)

SAMH-1113
6/15/2020: ND (< 21 µg/m³)
9/17/2020: ND (< 18 µg/m³)
12/16/2020: ND (< 18 µg/m³)
3/23/2021: ND (< 15 µg/m³)

SL-4
3/22/2021: ND (< 120 µg/m³)
4/19/2021: ND (< 100 µg/m³)

SL-5
3/23/2021: ND (< 14 µg/m³)
4/20/2021: ND (< 15 µg/m³)

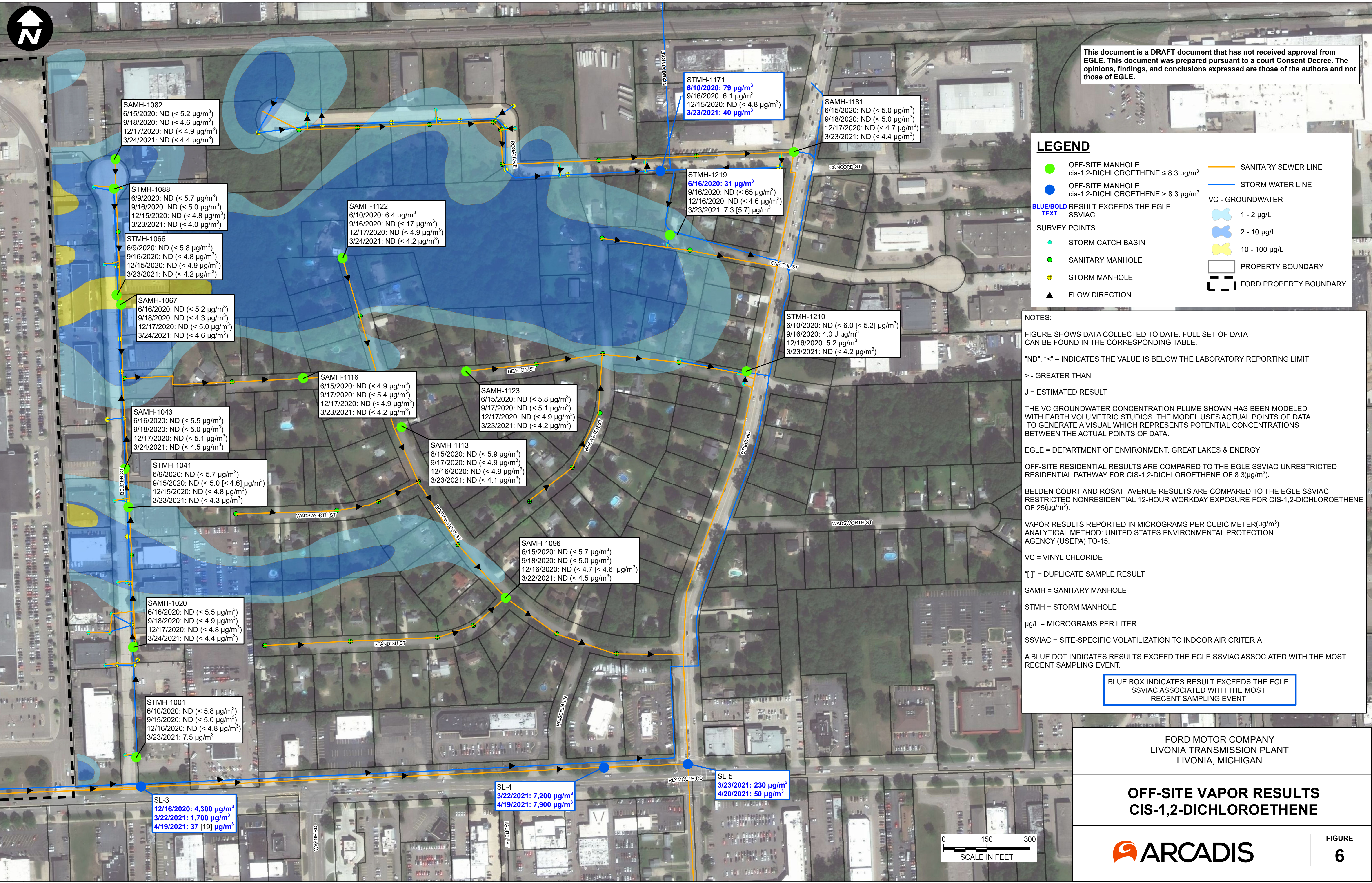


FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

OFF-SITE VAPOR RESULTS 1,4-DIOXANE

FIGURE
5

CITY: Novi, DIV: ENV, DE: MG, PIC: R. ELLIS, PM: K. HINSKEY, PROJECT NUMBER: 30080642, COORDINATE SYSTEM: NAD, 1983, StatePlane Michigan South FIPS 2113, Feet Intl, T: ENV\Novi\Brighton_MilFord\GIS\GISData\GEC10_2021\Utility_Corridor\April_2021\Figure 6_Off-Site_Vapor_cis-1,2-Dichloroethene.mxd, PLOTTED: 5/5/2021 12:44:15 PM, BY: MSMiller



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LEGEND

- OFF-SITE MANHOLE cis-1,2-DICHLOROETHENE ≤ 8.3 µg/m³
- OFF-SITE MANHOLE cis-1,2-DICHLOROETHENE > 8.3 µg/m³
- SANITARY SEWER LINE
- STORM WATER LINE
- VC - GROUNDWATER
- BLUE/BOLD TEXT RESULT EXCEEDS THE EGLE SSVIAC
- SURVEY POINTS
- STORM CATCH BASIN
- SANITARY MANHOLE
- STORM MANHOLE
- ▲ FLOW DIRECTION
- VC - 1 - 2 µg/L
- VC - 2 - 10 µg/L
- VC - 10 - 100 µg/L
- PROPERTY BOUNDARY
- FORD PROPERTY BOUNDARY

NOTES:

FIGURE SHOWS DATA COLLECTED TO DATE. FULL SET OF DATA CAN BE FOUND IN THE CORRESPONDING TABLE.

"ND", "<" - INDICATES THE VALUE IS BELOW THE LABORATORY REPORTING LIMIT

> - GREATER THAN

J = ESTIMATED RESULT

THE VC GROUNDWATER CONCENTRATION PLUME SHOWN HAS BEEN MODELED WITH EARTH VOLUMETRIC STUDIOS. THE MODEL USES ACTUAL POINTS OF DATA TO GENERATE A VISUAL WHICH REPRESENTS POTENTIAL CONCENTRATIONS BETWEEN THE ACTUAL POINTS OF DATA.

EGLE = DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY

OFF-SITE RESIDENTIAL RESULTS ARE COMPARED TO THE EGLE SSVIAC UNRESTRICTED RESIDENTIAL PATHWAY FOR CIS-1,2-DICHLOROETHENE OF 8.3(µg/m³).

BELDEN COURT AND ROSATI AVENUE RESULTS ARE COMPARED TO THE EGLE SSVIAC RESTRICTED NONRESIDENTIAL 12-HOUR WORKDAY EXPOSURE FOR CIS-1,2-DICHLOROETHENE OF 25(µg/m³).

VAPOR RESULTS REPORTED IN MICROGRAMS PER CUBIC METER(µg/m³). ANALYTICAL METHOD: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) TO-15.

VC = VINYL CHLORIDE

"["] = DUPLICATE SAMPLE RESULT

SAMH = SANITARY MANHOLE

STMH = STORM MANHOLE

µg/L = MICROGRAMS PER LITER

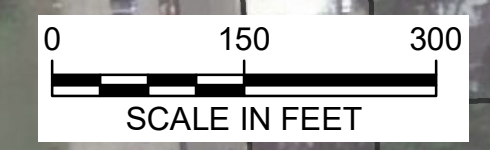
SSVIAC = SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA

A BLUE DOT INDICATES RESULTS EXCEED THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT.

BLUE BOX INDICATES RESULT EXCEEDS THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

**OFF-SITE VAPOR RESULTS
CIS-1,2-DICHLOROETHENE**





This document is a DRAFT document that has not received approval from EGLE. This document was prepared pursuant to a court Consent Decree. The opinions, findings, and conclusions expressed are those of the authors and not those of EGLE.

LEGEND

- OFF-SITE MANHOLE TRICHLOROETHENE ≤ 2.0 µg/m³
- OFF-SITE MANHOLE TRICHLOROETHENE > 2.0 µg/m³
- TEXT RESULT EXCEEDS THE EGLE SSVIAC
- SURVEY POINTS
- STORM CATCH BASIN
- SANITARY MANHOLE
- STORM MANHOLE
- ▲ FLOW DIRECTION
- SANITARY SEWER LINE
- STORM WATER LINE
- VC - GROUNDWATER
- 1 - 2 µg/L
- 2 - 10 µg/L
- 10 - 100 µg/L
- PROPERTY BOUNDARY
- FORD PROPERTY BOUNDARY

NOTES:

FIGURE SHOWS DATA COLLECTED TO DATE. FULL SET OF DATA CAN BE FOUND IN THE CORRESPONDING TABLE.

"ND", "<" - INDICATES THE VALUE IS BELOW THE LABORATORY REPORTING LIMIT

> - GREATER THAN

J = ESTIMATED RESULT

THE VC GROUNDWATER CONCENTRATION PLUME SHOWN HAS BEEN MODELED WITH EARTH VOLUMETRIC STUDIOS. THE MODEL USES ACTUAL POINTS OF DATA TO GENERATE A VISUAL WHICH REPRESENTS POTENTIAL CONCENTRATIONS BETWEEN THE ACTUAL POINTS OF DATA.

EGLE = DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY

OFF-SITE RESIDENTIAL RESULTS ARE COMPARED TO THE EGLE SSVIAC UNRESTRICTED RESIDENTIAL PATHWAY FOR TRICHLOROETHENE OF 2.0 (µg/m³).

BELDEN COURT AND ROSATI AVENUE RESULTS ARE COMPARED TO THE EGLE SSVIAC RESTRICTED NONRESIDENTIAL 12-HOUR WORKDAY EXPOSURE FOR TRICHLOROETHENE OF 4.0 (µg/m³).

VAPOR RESULTS REPORTED IN MICROGRAMS PER CUBIC METER (µg/m³). ANALYTICAL METHOD: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) TO-15.

VC = VINYL CHLORIDE

"[]" = DUPLICATE SAMPLE RESULT

SAMH = SANITARY MANHOLE

STMH = STORM MANHOLE

µg/L = MICROGRAMS PER LITER

UB = ANALYTE CONSIDERED NON-DETECT AT THE REPORTING LIMIT DUE TO ASSOCIATED BLANK CONTAMINATION.

SSVIAC = SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA

A BLUE DOT INDICATES RESULTS EXCEED THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT.

BLUE BOX INDICATES RESULT EXCEEDS THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT

SAMH-1082
6/15/2020: 3.7 J µg/m³
9/18/2020: ND (< 6.3 µg/m³)
12/17/2020: 2.5 J µg/m³
3/24/2021: ND (< 6.0 µg/m³)

STMH-1088
6/9/2020: ND (< 7.8 µg/m³)
9/16/2020: ND (< 6.7 µg/m³)
12/15/2020: ND (< 6.4 µg/m³)
3/23/2021: ND (< 5.5 µg/m³)

STMH-1066
6/9/2020: ND (< 7.9 µg/m³)
9/16/2020: ND (< 6.5 µg/m³)
12/15/2020: ND (< 6.7 µg/m³)
3/23/2021: ND (< 5.8 µg/m³)

SAMH-1067
6/16/2020: 97 µg/m³
9/18/2020: ND (< 5.8 µg/m³)
12/17/2020: ND (< 6.8 µg/m³)
3/24/2021: ND (< 6.3 µg/m³)

SAMH-1122
6/10/2020: 25 µg/m³
9/16/2020: ND (< 23 µg/m³)
12/17/2020: ND (< 6.6 µg/m³)
3/24/2021: ND (< 5.7 µg/m³)

SAMH-1116
6/15/2020: 44 µg/m³
9/17/2020: ND (< 7.4 µg/m³)
12/17/2020: ND (< 6.7 µg/m³)
3/23/2021: ND (< 5.7 µg/m³)

SAMH-1123
6/15/2020: ND (< 7.9 µg/m³)
9/17/2020: ND (< 7.0 UB µg/m³)
12/17/2020: ND (< 6.6 µg/m³)
3/23/2021: ND (< 5.8 µg/m³)

SAMH-1113
6/15/2020: ND (< 8.0 µg/m³)
9/17/2020: ND (< 6.6 µg/m³)
12/16/2020: ND (< 6.7 µg/m³)
3/23/2021: ND (< 5.6 µg/m³)

SAMH-1043
6/16/2020: ND (< 7.5 µg/m³)
9/18/2020: ND (< 6.8 µg/m³)
12/17/2020: ND (< 6.9 µg/m³)
3/24/2021: ND (< 6.1 µg/m³)

STMH-1041
6/9/2020: 47 µg/m³
9/15/2020: ND (< 6.8 [6.2] µg/m³)
12/15/2020: ND (< 6.5 µg/m³)
3/23/2021: ND (< 5.8 µg/m³)

SAMH-1020
6/16/2020: ND (< 7.4 µg/m³)
9/18/2020: ND (< 6.6 µg/m³)
12/17/2020: ND (< 6.5 µg/m³)
3/24/2021: ND (< 6.0 µg/m³)

STMH-1001
6/10/2020: 26 µg/m³
9/15/2020: ND (< 6.8 µg/m³)
12/16/2020: ND (< 6.5 µg/m³)
3/23/2021: ND (< 5.6 µg/m³)

SL-3
12/16/2020: 1,400 µg/m³
3/22/2021: 1,000 µg/m³
4/19/2021: 14 [7.7 J] µg/m³

STMH-1171
6/10/2020: 67 µg/m³
9/16/2020: ND (< 6.9 µg/m³)
12/15/2020: ND (< 6.4 µg/m³)
3/23/2021: 1.7 J µg/m³

SAMH-1181
6/15/2020: ND (< 6.8 µg/m³)
9/18/2020: ND (< 6.8 µg/m³)
12/17/2020: ND (< 6.4 µg/m³)
3/23/2021: ND (< 6.0 µg/m³)

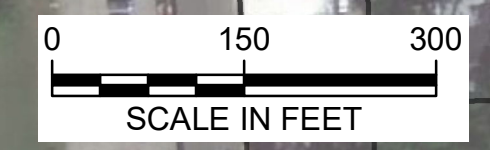
STMH-1219
6/16/2020: ND (< 7.1 µg/m³)
9/16/2020: ND (< 88 µg/m³)
12/16/2020: ND (< 6.2 µg/m³)
3/23/2021: ND (< 6.1 [ND < 5.6] µg/m³)

STMH-1210
6/10/2020: 6.7 J [4.6 J] µg/m³
9/16/2020: ND (< 6.8 µg/m³)
12/16/2020: ND (< 6.7 µg/m³)
3/23/2021: ND (< 5.7 µg/m³)

SAMH-1096
6/15/2020: ND (< 7.7 µg/m³)
9/18/2020: ND (< 6.8 µg/m³)
12/16/2020: ND (< 6.4 [6.3] µg/m³)
3/22/2021: ND (< 6.1 µg/m³)

SL-5
3/23/2021: 110 µg/m³
4/20/2021: 38 µg/m³

SL-4
3/22/2021: 4,400 µg/m³
4/19/2021: 3,500 µg/m³



CITY: Novi, DIV: ENV, DE: MG, PIC: R. ELLIS, PM: K. HINSKEY, PROJECT NUMBER: 30080642, COORDINATE SYSTEM: NAD, 1983, StatePlane Michigan South FIPS 2113, Feet Intl, T1_ENV\Novi\Brighton_MilFord\GIS\GISData\GEC10_2021\Utility Corridor\April_2021\Figure 7_Off-Site_Vapor_Trichloroethene.mxd PLOTTED: 5/6/2021 11:25:35 PM BY: MSMiller

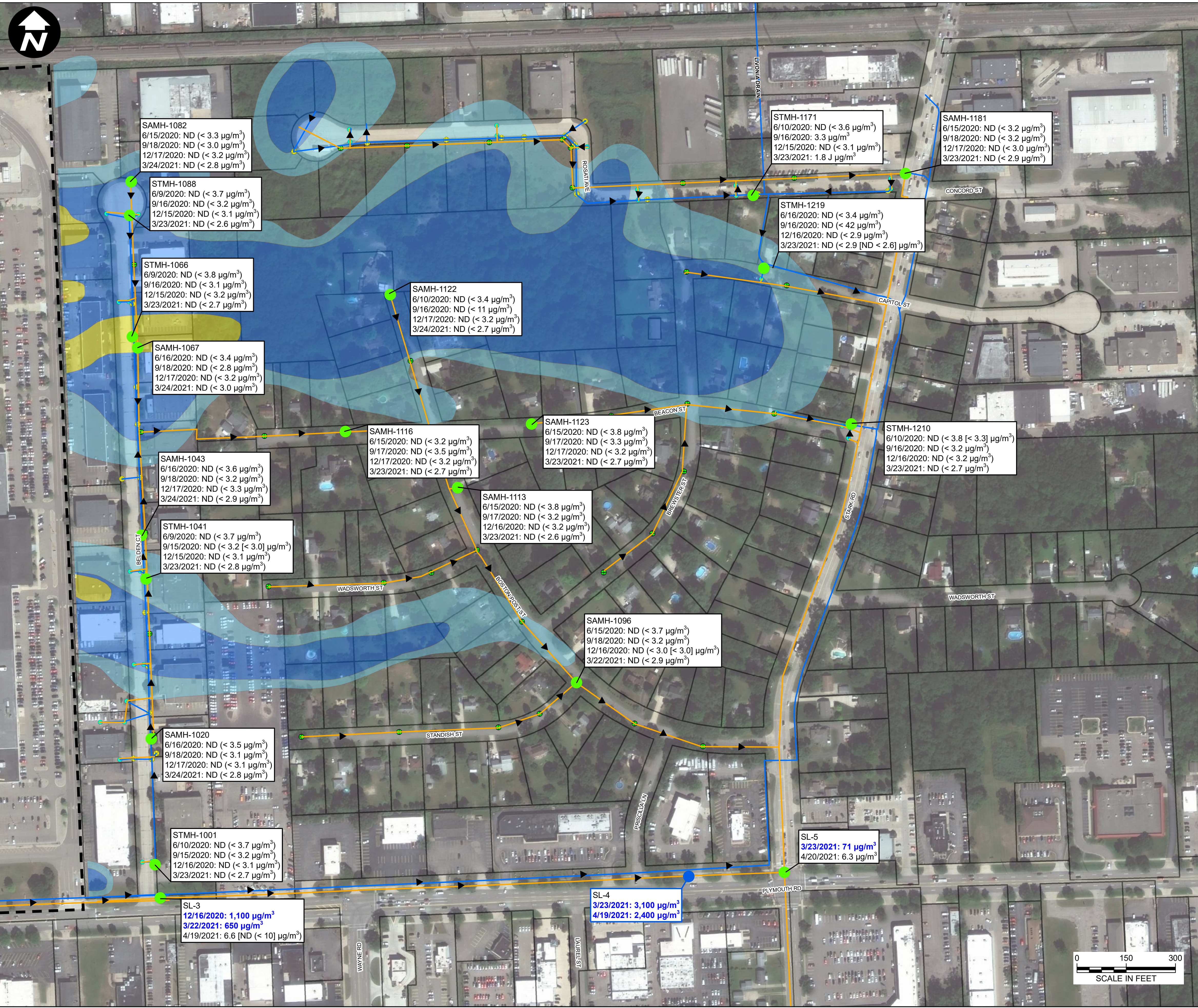
FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

**OFF-SITE VAPOR RESULTS
TRICHLOROETHENE**

ARCADIS

FIGURE
7

CITY: Novi, DIV: ENV, DE: MG, PIC: R. ELLIS, PM: K. HINSKEY, PROJECT NUMBER: 30080642, COORDINATE SYSTEM: NAD, 1983, StatePlane Michigan South FIPS 2113 Feet Intl, T: ENV\Novi\Brighton_Milford\GIS\GISdata\GEO\10_2021\Utility Corridor\April_2021\Figure 8_Off-Site_Vapor_Vinyl Chloride.mxd, PLOTTED: 5/5/2021 11:11:12 PM, BY: MSMiller



This document is a DRAFT document that has not received approval from EGLE. This document was prepared pursuant to a court Consent Decree. The opinions, findings, and conclusions expressed are those of the authors and not those of EGLE.

LEGEND

- OFF-SITE MANHOLE VINYL CHLORIDE ≤ 1.6 µg/m³
- OFF-SITE MANHOLE VINYL CHLORIDE > 1.6 µg/m³
- BLUE/BOLD TEXT SSVIAC
- SURVEY POINTS
- STORM CATCH BASIN
- SANITARY MANHOLE
- STORM MANHOLE
- FLOW DIRECTION
- SANITARY SEWER LINE
- STORM WATER LINE
- VC - GROUNDWATER
- 1 - 2 µg/L
- 2 - 10 µg/L
- 10 - 100 µg/L
- PROPERTY BOUNDARY
- FORD PROPERTY BOUNDARY

NOTES:

FIGURE SHOWS DATA COLLECTED TO DATE. FULL SET OF DATA CAN BE FOUND IN THE CORRESPONDING TABLE.

"ND", "<" - INDICATES THE VALUE IS BELOW THE LABORATORY REPORTING LIMIT

> - GREATER THAN

J = ESTIMATED RESULT

THE VC GROUNDWATER CONCENTRATION PLUME SHOWN HAS BEEN MODELED WITH EARTH VOLUMETRIC STUDIOS. THE MODEL USES ACTUAL POINTS OF DATA TO GENERATE A VISUAL WHICH REPRESENTS POTENTIAL CONCENTRATIONS BETWEEN THE ACTUAL POINTS OF DATA.

EGLE = DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY

OFF-SITE RESIDENTIAL RESULTS ARE COMPARED TO THE EGLE SSVIAC UNRESTRICTED RESIDENTIAL PATHWAY FOR VINYL CHLORIDE OF 1.6 (µg/m³).

BELDEN COURT AND ROSATI AVENUE RESULTS ARE COMPARED TO THE EGLE SSVIAC RESTRICTED NONRESIDENTIAL 12-HOUR WORKDAY EXPOSURE FOR VINYL CHLORIDE OF 27 (µg/m³).

VAPOR RESULTS REPORTED IN MICROGRAMS PER CUBIC METER (µg/m³). ANALYTICAL METHOD: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) TO-15.

VC = VINYL CHLORIDE

"J" = DUPLICATE SAMPLE RESULT

SAMH = SANITARY MANHOLE

STMH = STORM MANHOLE

µg/L = MICROGRAMS PER LITER

SSVIAC = SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA

A BLUE DOT INDICATES RESULTS EXCEED THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT.

BLUE BOX INDICATES RESULT EXCEEDS THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

**OFF-SITE VAPOR RESULTS
VINYL CHLORIDE**

ARCADIS

FIGURE
8



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LEGEND

- OFF-SITE MONITORING MANHOLE VINYL CHLORIDE $\leq 13 \mu\text{g/L}$.
- OFF-SITE MONITORING MANHOLE VINYL CHLORIDE $> 13 \mu\text{g/L}$.
- MANHOLE NOT SAMPLED
- TEXT RESULT EXCEEDS THE EGLE SSVIAC
- SURVEY POINTS
- STORM CATCH BASIN
- CHAMBER
- SANITARY MANHOLE
- SANITARY MANHOLE / COULD NOT OPEN
- STORM MANHOLE
- PROPERTY BOUNDARY
- FORD PROPERTY BOUNDARY
- ▲ FLOW DIRECTION
- STORM WATER LINE
- SANITARY SEWER LINE

NOTES:

FIGURE SHOWS DATA COLLECTED TO DATE. FULL SET OF DATA CAN BE FOUND IN THE CORRESPONDING TABLE.

EGLE = DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY

THE EGLE GROUNDWATER SURFACE WATER INTERFACE PROTECTION CRITERIA UPDATED JUNE 25, 2018 FOR VC IS $13 \mu\text{g/L}$.

VC = VINYL CHLORIDE

SL = SAMPLING LOCATION

LIQUID RESULTS REPORTED IN MICROGRAMS PER LITER ($\mu\text{g/L}$), ANALYTICAL METHOD: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) 8260B FOR VOCs AND 8260B SELECTED ION MONITORING (SIM) FOR SVOCs.

SVOC = SEMI-VOLATILE ORGANIC COMPOUNDS

[" "] = DUPLICATE SAMPLE RESULT

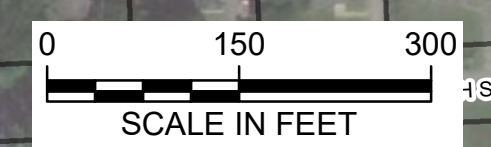
SAMH = SANITARY MANHOLE

$\mu\text{g/L}$ = MICRO GRAMS PER LITER

SSVIAC = SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA

A BLUE DOT INDICATES RESULTS EXCEED THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT

BLUE BOX INDICATES RESULT EXCEEDS THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT

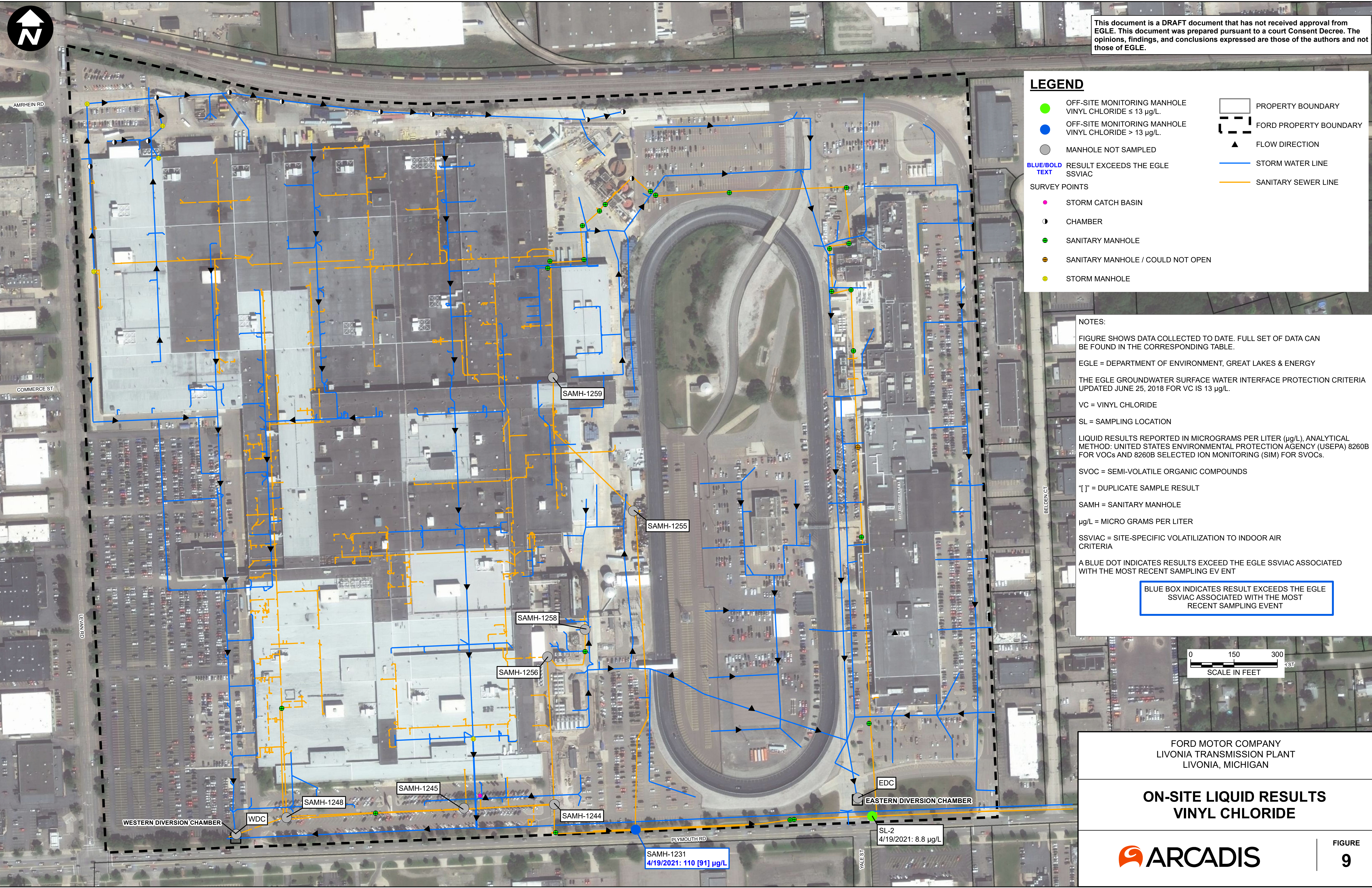


FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

**ON-SITE LIQUID RESULTS
VINYL CHLORIDE**



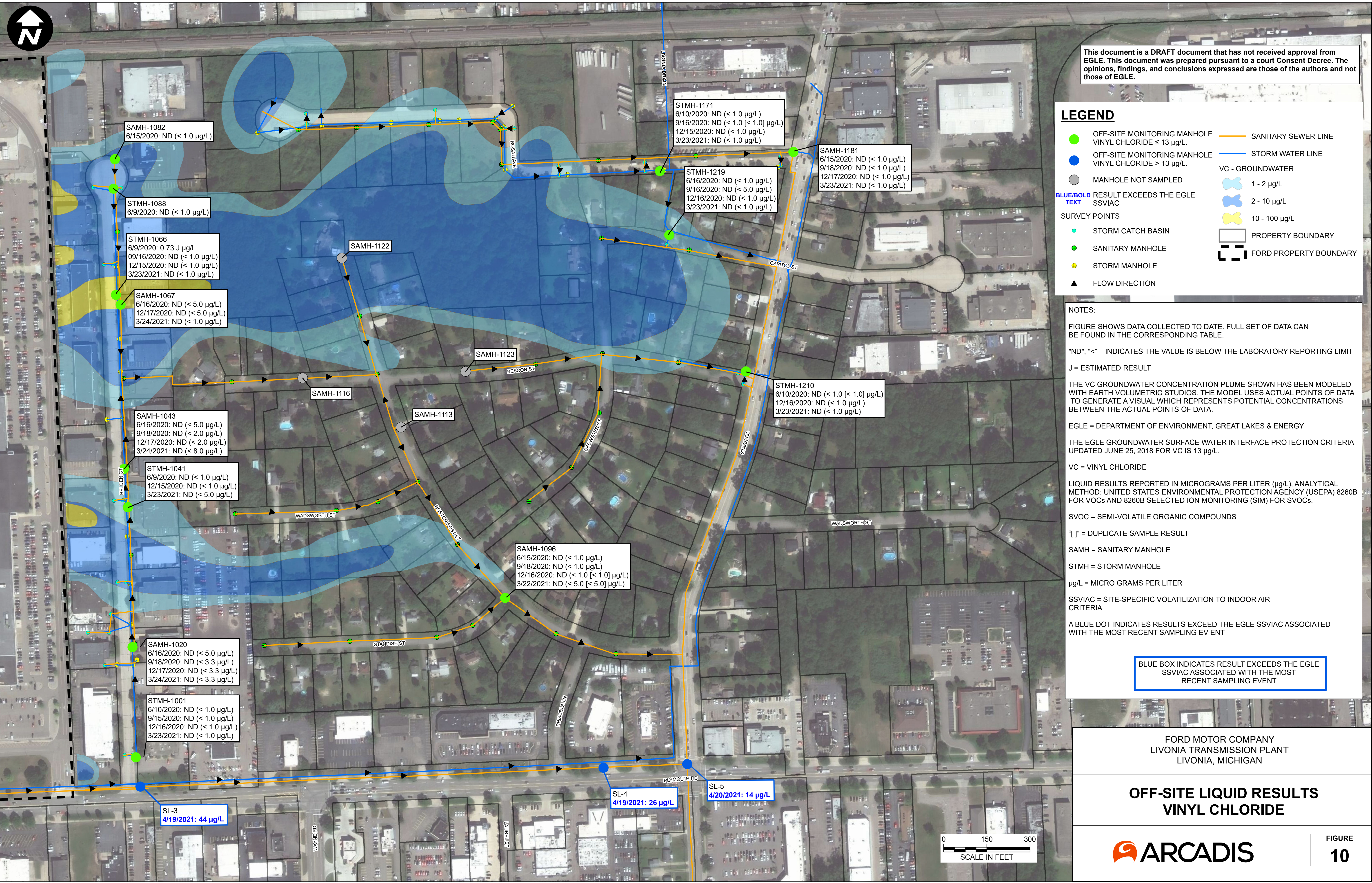
CITY: Novi; DIV: ENV; DE: MG; PIC: R. ELLIS; PM: K. HINSKEY; PROJECT NUMBER: 30080642; COORDINATE SYSTEM: NAD 1983; StatePlane Michigan South FIPS 2113; Feet Intl; T1_ENV\Novi\Brighton_MifFord\Livonia\GIS\Docs\GEC\10_2021\Utility Corridor\April_2021\Figure 9_On-Site_Liquid_Vinyl Chloride.mxd; PLOTTED: 5/5/2021 1:53:06 PM; BY: MSMiller



SAMH-1231
4/19/2021: 110 [91] $\mu\text{g/L}$

SL-2
4/19/2021: 8.8 $\mu\text{g/L}$

CITY: Novi; DIV: ENV; DE: MG; PIC: R. ELLIS; PM: K. HINSKEY; PROJECT NUMBER: 3080642; COORDINATE SYSTEM: NAD 1983; StatePlane Michigan South FIPS 2113; Feet Intl; T: ENV\Novi\Brighton_MilFord\GIS\Docs\GEC10_2021\Figure 10_OffSite_Liquid_Vinyl Chloride.mxd; PLOTTED: 5/5/2021 1:36:48 PM; BY: MSW/llr



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LEGEND

- OFF-SITE MONITORING MANHOLE VINYL CHLORIDE ≤ 13 µg/L
- OFF-SITE MONITORING MANHOLE VINYL CHLORIDE > 13 µg/L
- MANHOLE NOT SAMPLED
- RESULT EXCEEDS THE EGLE SSVIAC
- SURVEY POINTS
- STORM CATCH BASIN
- SANITARY MANHOLE
- STORM MANHOLE
- ▲ FLOW DIRECTION
- SANITARY SEWER LINE
- STORM WATER LINE
- VC - GROUNDWATER
- 1 - 2 µg/L
- 2 - 10 µg/L
- 10 - 100 µg/L
- PROPERTY BOUNDARY
- FORD PROPERTY BOUNDARY

NOTES:

FIGURE SHOWS DATA COLLECTED TO DATE. FULL SET OF DATA CAN BE FOUND IN THE CORRESPONDING TABLE.

"ND", "<" - INDICATES THE VALUE IS BELOW THE LABORATORY REPORTING LIMIT

J = ESTIMATED RESULT

THE VC GROUNDWATER CONCENTRATION PLUME SHOWN HAS BEEN MODELED WITH EARTH VOLUMETRIC STUDIOS. THE MODEL USES ACTUAL POINTS OF DATA TO GENERATE A VISUAL WHICH REPRESENTS POTENTIAL CONCENTRATIONS BETWEEN THE ACTUAL POINTS OF DATA.

EGLE = DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY

THE EGLE GROUNDWATER SURFACE WATER INTERFACE PROTECTION CRITERIA UPDATED JUNE 25, 2018 FOR VC IS 13 µg/L.

VC = VINYL CHLORIDE

LIQUID RESULTS REPORTED IN MICROGRAMS PER LITER (µg/L), ANALYTICAL METHOD: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) 8260B FOR VOCs AND 8260B SELECTED ION MONITORING (SIM) FOR SVOCs.

SVOC = SEMI-VOLATILE ORGANIC COMPOUNDS

"[" = DUPLICATE SAMPLE RESULT

SAMH = SANITARY MANHOLE

STMH = STORM MANHOLE

µg/L = MICRO GRAMS PER LITER

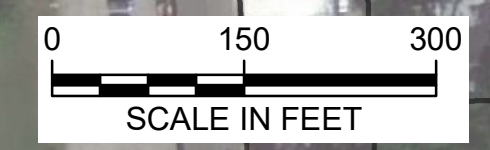
SSVIAC = SITE-SPECIFIC VOLATILIZATION TO INDOOR AIR CRITERIA

A BLUE DOT INDICATES RESULTS EXCEED THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT

BLUE BOX INDICATES RESULT EXCEEDS THE EGLE SSVIAC ASSOCIATED WITH THE MOST RECENT SAMPLING EVENT

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

OFF-SITE LIQUID RESULTS VINYL CHLORIDE



Tables

Location: Survey ID: Sample Date:	EGLE Nonresidential SSVIAC 12 hour exposure	MH-1231 SAMH-1231					MH-1244 SAMH-1244			MH-1245 SAMH-1245			MH-1248 SAMH-1248		MH-1255 SAMH-1255		
		6/9/2020	9/16/2020	12/15/2020	3/22/2021	4/19/2021	12/15/2020	3/22/2021	4/19/2021	12/15/2020	3/22/2021	4/19/2021	3/22/2021	4/19/2021	12/16/2020	3/23/2021	4/20/2021
		Volatile Organic Compounds (VOCs)															
1,1-Dichloroethene	610	< 110	240 J	100 J	190 J	67 J	< 4.5	14	87	< 4.3	< 4.2	< 4.3	< 4.4 [< 4.3]	< 4.6	32	37 J	4.3 J [3.2 J]
1,4-Dioxane	24	< 400	< 940	< 690	< 730	< 370	< 16	< 30	< 200	< 16	< 15	1.2 J	< 16 [< 16]	< 17	< 120	< 220	< 21 [< 30]
cis-1,2-Dichloroethene	25	25,000	42,000	37,000	46,000	27,000	400	1,000	21,000	150	2.2 J	< 4.3	6.0 [6.8]	5.8	510	810	260 [250]
Tetrachloroethene	82	< 190	< 440	< 330	< 340	< 180	< 7.7	< 14	< 92	< 7.4	< 7.2	< 7.4	< 7.5 [< 7.4]	< 7.8	< 55	< 100	< 10 [< 14]
trans-1,2-Dichloroethene	250	270	440	260	400	180	3.7 J	20	180	2.6 J	< 4.2	< 4.3	< 4.4 [< 4.3]	< 4.6	20 J	37 J	8.6 [6.9 J]
Trichloroethene	4.0	15,000	18,000	14,000	19,000	10,000	280	1,100	11,000	120	2.0 J	< 5.9	12 [10]	2.2 J	83	140	9.3 [9.1 J]
Vinyl chloride	27	9,600	16,000	11,000	23,000	9,800	100	1,200	8,500	45	< 2.7	< 2.8	< 2.8 [0.89 J]	3.0	5,600	7,800	1,200 [1,200]

Notes:
All results reported in $\mu\text{g}/\text{m}^3$.
Bold Result exceeds the EGLE site-specific volatilization to indoor air criteria (SSVIAC) to evaluate vapor migration in preferential pathways developed for restricted nonresidential 12-hour workday exposure.
< Denotes not detected above reporting limit or method detection limit.

Abbreviations:
[] duplicate sample results
 $\mu\text{g}/\text{m}^3$ micrograms per cubic meter
EDC eastern diversion chamber
EGLE Michigan Department of Environment, Great Lakes, and Energy
ID identification
J estimated result
MH manhole
NA not available/not applicable
SAMH sanitary manhole
SL sample location
UB Analyte considered non-detect at the listed value due to associated blank contamination
WDC western diversion chamber

Analytical Methods:
United States Environmental Protection Agency (USEPA) Method TO-15

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Location: Survey ID: Sample Date:	EGLE Nonresidential SSVIAC 12 hour exposure	MH-1256			MH-1258			MH-1259		EDC				
		SAMH-1256			SAMH-1258			SAMH-1259		NA				
		12/16/2020	3/22/2021	4/19/2021	12/16/2020	3/22/2021	4/19/2021	3/23/2021	4/19/2021	6/9/2020	9/16/2020	12/15/2020	3/23/2021	4/20/2021
Volatile Organic Compounds (VOCs)														
1,1-Dichloroethene	610	< 5.0	35	140	< 4.8	< 4.1	< 4.2	< 4.3	0.70 J	< 5.5	< 22	< 4.6	< 4.0	< 4.2
1,4-Dioxane	24	< 18	< 130	< 290	< 17	< 15	< 15	< 16	< 16	< 20	< 78	< 16	< 15	< 15
cis-1,2-Dichloroethene	25	150	7,400	30,000	860	43	260	< 4.3	5.4	< 5.5	< 22	< 4.6	4.6	3.3 J
Tetrachloroethene	82	< 8.6	< 60	< 140	< 8.2	< 7.0	2.2 J	< 7.4	< 7.8	< 9.5	48 UB	< 7.8	< 6.9	< 7.1
trans-1,2-Dichloroethene	250	< 5.0	63	270	3.7 J	< 4.1	1.4 J	< 4.3	< 4.6	< 5.5	< 22	< 4.6	< 4.0	1.0 J
Trichloroethene	4.0	15	2,100	15,000	70	3.4 J	20	1.7 J	7.0	16	< 29	< 6.2	7.5	19
Vinyl chloride	27	10	3,100	14,000	100	5.8	32	0.56 J	7.0	< 3.6	< 14	< 2.9	0.58 J	< 2.7

Notes:

All results reported in µg/m³.

Bold Result exceeds the EGLE site-specific volatilization to indoor air criteria (SSVIAC) to evaluate vapor migration in preferential pathways developed for restricted nonresidential 12-hour workday exposure.

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Abbreviations:

- [] duplicate sample results
- µg/m³ micrograms per cubic meter
- EDC eastern diversion chamber
- EGLE Michigan Department of Environment, Great Lakes, and Energy
- ID identification
- J estimated result
- MH manhole
- NA not available/not applicable
- SAMH sanitary manhole
- SL sample location
- UB Analyte considered non-detect at the listed value due to associated blank contamination
- WDC western diversion chamber

Analytical Methods:

United States Environmental Protection Agency (USEPA) Method TO-15

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Location: Survey ID: Sample Date:	EGLE Nonresidential SSVIAC 12 hour exposure	WDC					SL-2				
		NA					NA				
		6/9/2020	9/16/2020	12/15/2020	3/23/2021	4/20/2021	6/9/2020	9/15/2020	12/15/2020	3/30/2021	4/20/2021
Volatile Organic Compounds (VOCs)											
1,1-Dichloroethene	610	< 5.2	< 4.8	< 5.0	< 3.9	< 4.0	9.5	16	14 J	< 4.2	6.0 J
1,4-Dioxane	24	< 19	< 18	< 18	< 14	< 15	< 21	< 53	< 89	< 15	< 29
cis-1,2-Dichloroethene	25	< 5.2	< 4.8	< 5.0	< 3.9	< 4.0	1,900	4,600	6,800	89	2,200
Tetrachloroethene	82	< 8.9	< 8.2	< 8.5	< 6.7	2.1 J	< 9.8	< 25	< 42	< 7.2	< 14
trans-1,2-Dichloroethene	250	< 5.2	< 4.8	< 5.0	< 3.9	< 4.0	29	48	44	< 4.2	17
Trichloroethene	4.0	3.5 J	17	< 6.8	5.6	< 5.5	1,500	2,000	2,200	52	880
Vinyl chloride	27	< 3.4	< 3.1	< 3.2	< 2.5	< 2.6	520	1,700	1,700	34	640

Notes:
All results reported in µg/m³.
Bold Result exceeds the EGLE site-specific volatilization to indoor air criteria (SSVIAC) to evaluate vapor migration in preferential pathways developed for restricted nonresidential 12-hour workday exposure.
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Location: Survey ID: Sample Date:	EGLE Nonresidential SSVIAC 12 hour exposure	MH-1001				MH-1020				MH-1041				MH-1043			
		STMH-1001				SAMH-1020				STMH-1041				SAMH-1043			
		6/10/2020	9/15/2020	12/16/2020	3/23/2021	6/16/2020	9/18/2020	12/17/2020	3/24/2021	6/9/2020	9/15/2020	12/15/2020	3/23/2021	6/16/2020	9/18/2020	12/17/2020	3/24/2021
Volatile Organic Compounds (VOCs)																	
1,1-Dichloroethene	610	< 5.8	< 5.0	< 4.8	< 4.1	< 5.5	< 4.9	< 4.8	< 4.4	< 5.7	< 5.0 [< 4.6]	< 4.8	< 4.3	< 5.5	< 5.0	< 5.1	< 4.5
1,4-Dioxane	24	< 21	< 18	< 18	< 15	< 20	< 18	< 17	< 16	< 21	< 18 [< 17]	< 17	< 16	< 20	< 18	< 18	< 16
cis-1,2-Dichloroethene	25	< 5.8	< 5.0	< 4.8	7.5	< 5.5	< 4.9	< 4.8	< 4.4	< 5.7	< 5.0 [< 4.6]	< 4.8	< 4.3	< 5.5	< 5.0	< 5.1	< 4.5
Tetrachloroethene	82	< 9.9	< 8.6	< 8.2	< 7.1	< 9.4	< 8.3	< 8.2	< 7.5	< 9.8	< 8.6 [< 7.8]	< 8.2	< 7.3	< 9.4	< 8.6	2.9 J	< 7.7
trans-1,2-Dichloroethene	250	< 5.8	2.1 J	< 4.8	< 4.1	< 5.5	< 4.9	< 4.8	< 4.4	< 5.7	< 5.0 [< 4.6]	< 4.8	< 4.3	< 5.5	< 5.0	< 5.1	< 4.5
Trichloroethene	4.0	26	< 6.8	< 6.5	< 5.6	< 7.4	< 6.6	< 6.5	< 6.0	47	< 6.8 [< 6.2]	< 6.5	< 5.8	< 7.5	< 6.8	< 6.9	< 6.1
Vinyl chloride	27	< 3.7	< 3.2	< 3.1	< 2.7	< 3.5	< 3.1	< 3.1	< 2.8	< 3.7	< 3.2 [< 3.0]	< 3.1	< 2.8	< 3.6	< 3.2	< 3.3	< 2.9

Notes:
All results reported in $\mu\text{g}/\text{m}^3$.
Bold Result exceeds the EGLE site-specific volatilization to indoor air criteria (SSVIAC) to evaluate vapor migration in preferential pathways developed for restricted nonresidential 12-hour workday exposure
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Abbreviations:
[] duplicate sample result
 $\mu\text{g}/\text{m}^3$ micrograms per cubic meter
EGLE Michigan Department of Environment, Great Lakes, and Energy
ID identification
NA not available/not applicable
J estimated result
MH manhole
SAMH sanitary manhole
STMH storm manhole
SL sample location

Analytical Methods:
United States Environmental Protection Agency (USEPA) Method TO-15

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Location: Survey ID: Sample Date:	EGLE Nonresidential SSVIAC 12 hour exposure	MH-1066 STMH-1066				MH-1067 SAMH-1067				MH-1082 SAMH-1082				MH-1088 STMH-1088			
		6/9/2020	9/16/2020	12/15/2020	3/23/2021	6/16/2020	9/18/2020	12/17/2020	3/24/2021	6/15/2020	9/18/2020	12/17/2020	3/24/2021	6/9/2020	9/16/2020	12/15/2020	3/23/2021
		Volatile Organic Compounds (VOCs)															
1,1-Dichloroethene	610	< 5.8	< 4.8	< 4.9	< 4.2	< 5.2	< 4.3	< 5.0	< 4.6	< 5.2	< 4.6	< 4.9	< 4.4	< 5.7	< 5.0	< 4.8	< 4.0
1,4-Dioxane	24	< 21	< 17	< 18	< 15	< 19	< 16	< 18	< 17	< 19	< 17	< 18	< 16	< 21	< 18	< 17	< 15
cis-1,2-Dichloroethene	25	< 5.8	< 4.8	< 4.9	< 4.2	< 5.2	< 4.3	< 5.0	< 4.6	< 5.2	< 4.6	< 4.9	< 4.4	< 5.7	< 5.0	< 4.8	< 4.0
Tetrachloroethene	82	< 10	< 8.2	< 8.4	< 7.2	< 8.9	< 7.4	22	< 7.9	< 8.8	< 8.0	20	< 7.5	< 9.8	< 8.5	< 8.1	< 6.9
trans-1,2-Dichloroethene	250	< 5.8	< 4.8	< 4.9	< 4.2	< 5.2	< 4.3	< 5.0	< 4.6	< 5.2	< 4.6	< 4.9	< 4.4	< 5.7	< 5.0	< 4.8	< 4.0
Trichloroethene	4.0	< 7.9	< 6.5	< 6.7	< 5.8	97	< 5.8	< 6.8	< 6.3	3.7 J	< 6.3	2.5 J	< 6.0	< 7.8	< 6.7	< 6.4	< 5.5
Vinyl chloride	27	< 3.8	< 3.1	< 3.2	< 2.7	< 3.4	< 2.8	< 3.2	< 3.0	< 3.3	< 3.0	< 3.2	< 2.8	< 3.7	< 3.2	< 3.1	< 2.6

Notes:
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< Denotes not detected above reporting limit or method detection limit.

Abbreviations:
[] duplicate sample result
µg/m³ micrograms per cubic meter
EGLE Michigan Department of Environment, Great Lakes, and Energy
ID identification
NA not available/not applicable
J estimated result
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SL sample location

Analytical Methods:
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Location: Survey ID: Sample Date:	EGLE Nonresidential SSVIAC 12 hour exposure	MH-1171 STMH-1171				MH-1181 SAMH-1181				SL-3 NA			SL-4 NA		SL-5 NA	
		6/10/2020	9/16/2020	12/15/2020	3/23/2021	6/15/2020	9/18/2020	12/17/2020	3/23/2021	12/16/2020	3/22/2021	4/19/2021	3/22/2021	4/19/2021	3/23/2021	4/20/2021
		Volatile Organic Compounds (VOCs)														
1,1-Dichloroethene	610	< 5.5	< 5.1	< 4.8	< 4.4	< 5.0	< 5.0	< 4.7	< 4.4	7.6 J	6.6 J	< 4.0 [< 16]	33	24 J	< 3.9	< 4.2
1,4-Dioxane	24	< 20	< 18	< 17	< 16	< 18	< 18	< 17	< 16	< 42	< 24	< 15 [< 58]	< 120	< 100	< 14	< 15
cis-1,2-Dichloroethene	25	79	6.1	< 4.8	40	< 5.0	< 5.0	< 4.7	< 4.4	4,300	1,700	37 [19]	7,200	7,900	230	50
Tetrachloroethene	82	< 9.5	< 8.7	< 8.1	< 7.5	< 8.6	< 8.6	1.4 J	< 7.6	< 20	< 12	< 6.9 [< 27]	< 55	< 48	< 6.6	< 7.2
trans-1,2-Dichloroethene	250	< 5.5	< 5.1	< 4.8	< 4.4	< 5.0	< 5.0	< 4.7	< 4.4	28	14	< 4.0 [< 16]	75	60	3.5 J	< 4.2
Trichloroethene	4.0	67	< 6.9	< 6.4	1.7 J	< 6.8	< 6.8	< 6.4	< 6.0	1,400	1,000	14 [7.7 J]	4,400	3,500	110	38
Vinyl chloride	27	< 3.6	3.3	< 3.1	1.8 J	< 3.2	< 3.2	< 3.0	< 2.9	1,100	650	6.6 [< 10]	3,100	2,400	71	6.3

Notes:
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Abbreviations:
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SL sample location

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Location:	EGLE	MH-1001				MH-1020				MH-1041			MH-1043			
Survey ID:	GSI	STMH-1001				SAMH-1020				STMH-1041			SAMH-1043			
Sample Date:	2018	6/10/2020	9/15/2020	12/16/2020	3/23/2021	6/16/2020	9/18/2020	12/17/2020	3/24/2021	6/9/2020	12/15/2020	3/23/2021	6/16/2020	9/18/2020	12/17/2020	3/24/2021
Semi-Volatile Organic Compounds (SVOCs)																
1,4-Dioxane	280	1.1 J	< 2.0	<2.0 R	1.1 J	< 10	< 10	< 2.0	< 6.0	< 2.0	1.4 J	< 6.0	1.2 J	< 2.0	< 2.0	2.8 J
Volatile Organic Compounds (VOCs)																
1,1-Dichloroethene	130	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 3.3	< 3.3	< 3.3	< 1.0	< 1.0	< 5.0	< 5.0	< 2.0	< 2.0	< 8.0
cis-1,2-Dichloroethene	620	< 1.0	< 1.0	< 1.0	0.40 J	< 5.0	< 3.3	< 3.3	< 3.3	< 1.0	< 1.0	< 5.0	< 5.0	< 2.0	< 2.0	< 8.0
Tetrachloroethene	60	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 3.3	< 3.3	< 3.3	< 1.0	< 1.0	< 5.0	< 5.0	< 2.0	< 2.0	< 8.0
trans-1,2-Dichloroethene	1,500	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 3.3	< 3.3	< 3.3	< 1.0	< 1.0	< 5.0	< 5.0	< 2.0	< 2.0	< 8.0
Trichloroethene	200	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 3.3	< 3.3	< 3.3	< 1.0	< 1.0	< 5.0	< 5.0	< 2.0	< 2.0	< 8.0
Vinyl chloride	13	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 3.3	< 3.3	< 3.3	< 1.0	< 1.0	< 5.0	< 5.0	< 2.0	< 2.0	< 8.0

Notes:

All results are reported in µg/L.

Bold Result exceeds the EGLE Groundwater Surface Water Interface (GSI) Protection Criteria referenced in the EGLE tables, updated in August 2020.

< Denotes not detected above reporting limit.

Abbreviations:

- [] duplicate sample results
- µg/L micrograms per liter
- EGLE Michigan Department of Environment, Great Lakes, and Energy
- ID identification
- NA not available
- J estimated result
- R Sample results rejected due to analysis conducted outside of hold time
- MH manhole
- SAMH sanitary manhole
- STMH storm manhole

Analytical Methods:

United States Environmental Protection Agency (USEPA) Method 8260B Selected Ion Monitoring (SIM) for SVOCs
 USEPA Method 8260B for VOCs

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Location:	EGLE	MH-1066				MH-1067			MH-1082	MH-1088	MH-1096			MH-1171				
Survey ID:	GSI	STMH-1066				SAMH-1067			SAMH-1082	STMH-1088	SAMH-1096			STMH-1171				
Sample Date:	2018	6/9/2020	9/16/2020	12/15/2020	3/23/2021	6/16/2020	12/17/2020	3/24/2021	6/15/2020	6/9/2020	6/15/2020	9/18/2020	12/16/2020	3/22/2021	6/10/2020	9/16/2020	12/15/2020	3/23/2021
Semi-Volatile Organic Compounds (SVOCs)																		
1,4-Dioxane	280	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	1.2 J	< 2.0	< 2.0	0.89 J	5.2 [5.2]	< 6.0 [< 2.0]	< 2.0	0.89 J [< 2.0]	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																		
1,1-Dichloroethene	130	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 5.0 [< 5.0]	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0
cis-1,2-Dichloroethene	620	0.34 J	0.17 J	< 1.0	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 5.0 [< 5.0]	0.22 J	< 1.0 [< 1.0]	< 1.0	0.39 J
Tetrachloroethene	60	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 5.0 [< 5.0]	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0
trans-1,2-Dichloroethene	1,500	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 5.0 [< 5.0]	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0
Trichloroethene	200	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 5.0 [< 5.0]	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0
Vinyl chloride	13	0.73 J	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 5.0 [< 5.0]	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0

Notes:
 All results are reported in µg/L.
Bold Result exceeds the EGLE Groundwater Surface Water Interface (GSI) Protection Criteria referenced in the EGLE tables, updated in August 2020.
 < Denotes not detected above reporting limit.

Abbreviations:
 [] duplicate sample results
 µg/L micrograms per liter
 EGLE Michigan Department of Environment, Great Lakes, and Energy
 ID identification
 NA not available
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 MH manhole
 SAMH sanitary manhole
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Analytical Methods:
 United States Environmental Protection Agency (USEPA) Method 8260B Selected Ion Monitoring (SIM) for SVOCs
 USEPA Method 8260B for VOCs

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Location:	EGLE	MH-1181				MH-1210			MH-1219				MH-1231	SL-2	SL-3	SL-4	SL-5
Survey ID:	GSI	SAMH-1181				STMH-1210			STMH-1219				STMH-1219	NA	NA	NA	NA
Sample Date:	2018	6/15/2020	9/18/2020	12/17/2020	3/23/2021	6/10/2020	12/16/2020	3/23/2021	6/16/2020	9/16/2020	12/16/2020	3/23/2021	4/19/2021	4/20/2021	4/19/2021	4/19/2021	4/20/2021
Semi-Volatile Organic Compounds (SVOCs)																	
1,4-Dioxane	280	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0 [< 2.0]	< 2.0	< 2.0	< 2.0	0.92 J	< 2.0	< 2.0	7.8 [12]	5.5	7.0	6.6	5.8
Volatile Organic Compounds (VOCs)																	
1,1-Dichloroethene	130	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 33 [< 33]	< 4.0	< 14	< 10	< 5.0
cis-1,2-Dichloroethene	620	< 1.0	< 1.0	< 1.0	0.42 J	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	0.29 J	560 [560]	53	280	210	160
Tetrachloroethene	60	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 33 [< 33]	< 4.0	< 14	< 10	< 5.0
trans-1,2-Dichloroethene	1,500	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 33 [< 33]	< 4.0	< 14	< 10	< 5.0
Trichloroethene	200	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	180 [170]	15	79	56	34
Vinyl chloride	13	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	110 [91]	8.8	44	26	14

Notes:

All results are reported in µg/L.

Bold Result exceeds the EGLE Groundwater Surface Water Interface (GSI) Protection Criteria referenced in the EGLE tables, updated in August 2020.

< Denotes not detected above reporting limit.

Abbreviations:

- [] duplicate sample results
- µg/L micrograms per liter
- EGLE Michigan Department of Environment, Great Lakes, and Energy
- ID identification
- NA not available
- J estimated result
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- MH manhole
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- STMH storm manhole

Analytical Methods:

United States Environmental Protection Agency (USEPA) Method 8260B Selected Ion Monitoring (SIM) for SVOCs
USEPA Method 8260B for VOCs

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Location: Survey ID: Sample Date:	EGLE Residential SSVIAC	MH-1096 SAMH-1096				MH-1113 SAMH-1113				MH-1116 SAMH-1116				MH-1122 SAMH-1122			
		6/15/2020	9/18/2020	12/16/2020	3/22/2021	6/15/2020	9/17/2020	12/16/2020	3/23/2021	6/15/2020	9/17/2020	12/17/2020	3/23/2021	6/10/2020	9/16/2020	12/17/2020	3/24/2021
		Volatile Organic Compounds (VOCs)															
1,1-Dichloroethene	210	< 5.7	< 5.0	< 4.7 [< 4.6]	< 4.5	< 5.9	< 4.9	< 4.9	< 4.1	< 4.9	< 5.4	< 4.9	< 4.2	< 5.3	< 17	< 4.9	< 4.2
1,4-Dioxane	5.1	< 21	< 18	< 17 [< 17]	< 16	< 21	< 18	< 18	< 15	< 18	< 20	< 18	< 15	< 19	< 63	< 18	< 15
cis-1,2-Dichloroethene	8.3	< 5.7	< 5.0	< 4.7 [< 4.6]	< 4.5	< 5.9	< 4.9	< 4.9	< 4.1	< 4.9	< 5.4	< 4.9	< 4.2	6.4	< 17	< 4.9	< 4.2
Tetrachloroethene	41	< 9.8	< 8.5	< 8.0 [2.4 J]	< 7.7	< 10	< 8.4	< 8.4	2.6 J	< 8.4	< 9.3	1.2 J	< 7.2	9.4	< 30	< 8.4	< 7.2
trans-1,2-Dichloroethene	83	< 5.7	< 5.0	< 4.7 [< 4.6]	< 4.5	< 5.9	< 4.9	< 4.9	< 4.1	< 4.9	< 5.4	< 4.9	< 4.2	5.1 J	< 17	< 4.9	< 4.2
Trichloroethene	2.0	< 7.7	< 6.8	< 6.4 [< 6.3]	< 6.1	< 8.0	< 6.6	< 6.7	< 5.6	44	< 7.4	< 6.7	< 5.7	25	< 23	< 6.6	< 5.7
Vinyl chloride	1.6	< 3.7	< 3.2	< 3.0 [< 3.0]	< 2.9	< 3.8	< 3.2	< 3.2	< 2.6	< 3.2	< 3.5	< 3.2	< 2.7	< 3.4	< 11	< 3.2	< 2.7

Notes:

All results reported in $\mu\text{g}/\text{m}^3$.

Bold Result exceeds the unrestricted residential exposure Site-Specific Volatilization to Indoor Air Criteria (SSVIAC) to evaluate vapor migration in preferential pathways provided by EGLE on September 11, 2020.

< Denotes not detected above reporting limit or method detection limit.

Abbreviations:

- [] duplicate sample result
- $\mu\text{g}/\text{m}^3$ micrograms per cubic meter
- EGLE Michigan Department of Environment, Great Lakes, and Energy
- ID identification
- J estimated result
- MH manhole
- SAMH sanitary manhole
- STMH storm manhole
- UB Analyte considered non-detect at the reporting limit due to associated blank contamination.

Analytical Methods:

United States Environmental Protection Agency (USEPA) Method TO-15

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Location: Survey ID: Sample Date:	EGLE Residential SSVIAC	MH-1123 SAMH-1123				MH-1210 STMH-1210				MH-1219 STMH-1219			
		6/15/2020	9/17/2020	12/17/2020	3/23/2021	6/10/2020	9/16/2020	12/16/2020	3/23/2021	6/16/2020	9/16/2020	12/16/2020	3/23/2021
		Volatile Organic Compounds (VOCs)											
1,1-Dichloroethene	210	< 5.8	< 5.1	< 4.9	< 4.2	< 6.0 [< 5.2]	< 5.0	< 4.9	< 4.2	< 5.3	< 65	< 4.6	< 4.5 [< 4.1]
1,4-Dioxane	5.1	< 21	< 19	< 18	< 15	< 22 [< 19]	< 18	< 18	< 15	< 19	41 J	< 16	7.3 J [< 15]
cis-1,2-Dichloroethene	8.3	< 5.8	< 5.1	< 4.9	< 4.2	< 6.0 [< 5.2]	4.0 J	5.2	< 4.2	31	< 65	< 4.6	7.3 [5.7]
Tetrachloroethene	41	< 10	< 8.8 UB	< 8.4	< 7.2	< 10 [< 8.8]	< 8.5	4.5 J	< 7.2	< 9.0	< 110	< 7.8	< 7.7 [< 7.0]
trans-1,2-Dichloroethene	83	< 5.8	< 5.1	< 4.9	< 4.2	< 6.0 [< 5.2]	< 5.0	< 4.9	< 4.2	< 5.3	< 65	< 4.6	< 4.5 [< 4.1]
Trichloroethene	2.0	< 7.9	< 7.0 UB	< 6.6	< 5.8	6.7 J [4.6 J]	< 6.8	< 6.7	< 5.7	< 7.1	< 88	< 6.2	< 6.1 [< 5.6]
Vinyl chloride	1.6	< 3.8	< 3.3	< 3.2	< 2.7	< 3.8 [< 3.3]	< 3.2	< 3.2	< 2.7	< 3.4	< 42	< 2.9	< 2.9 [< 2.6]

Notes:

All results reported in $\mu\text{g}/\text{m}^3$.

Bold Result exceeds the unrestricted residential exposure Site-Specific Volatilization to Indoor Air Criteria (SSVIAC) to evaluate vapor migration in preferential pathways provided by EGLE on September 11, 2020.

< Denotes not detected above reporting limit or method detection limit.

Abbreviations:

- [] duplicate sample result
- $\mu\text{g}/\text{m}^3$ micrograms per cubic meter
- EGLE Michigan Department of Environment, Great Lakes, and Energy
- ID identification
- J estimated result
- MH manhole
- SAMH sanitary manhole
- STMH storm manhole
- UB Analyte considered non-detect at the reporting limit due to associated blank contamination.

Analytical Methods:

United States Environmental Protection Agency (USEPA) Method TO-15

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Location: Survey ID: Sample Date:	EGLE GSI 2018	MH-1020 SAMH-1020 6/16/2020	MH-1122 SAMH-1122 12/17/2020
Volatile Organic Compounds (VOCs)			
1,1-Dichloroethene	2,600	< 83	< 86
1,4-Dioxane	5,600	< 26,000	< 27,000
cis-1,2-Dichloroethene	12,000	< 83	< 86
Tetrachloroethene	1,200	< 83	< 86
trans-1,2-Dichloroethene	30,000	< 83	< 86
Trichloroethene	4,000	< 83	< 86
Vinyl chloride	260	< 66	< 69

Notes:

All results are reported in µg/kg.

Bold Result exceeds the EGLE Groundwater Surface Water Interface (GSI) Protection Criteria updated June 25, 2018.

< Denotes not detected above reporting limit or method detection limit.

Abbreviations:

EGLE Michigan Department of Environment, Great Lakes, and Energy

µg/kg micrograms per kilogram

ID identification

MH manhole

SAMH sanitary manhole

Analytical Method:

United States Environmental Protection Agency (USEPA) Method 8260B

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