

Ford Motor Company

RESPONSE ACTIVITY PLAN – UTILITY CORRIDOR EVALUATION

Livonia Transmission Plant


This document is a DRAFT document that has not received approval from the Michigan Department of Environmental Quality (MDEQ). 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 the MDEQ.

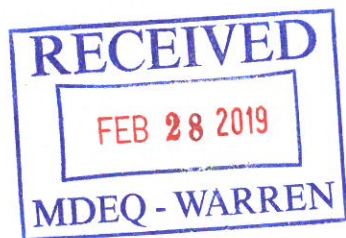
February 28, 2019



RESPONSE ACTIVITY PLAN – UTILITY CORRIDOR EVALUATION


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**RESPONSE ACTIVITY
PLAN – UTILITY
CORRIDOR
EVALUATION**

Livonia Transmission Plant
Area of Concern
Court Case: No. 2:1712372-GAD-RSW

Prepared for:
Ford Motor Company
Environmental Quality office
Fairlane Plaza North
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Dearborn, MI 48126

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Our Ref.:
MI001322.0001

Date:
February 28, 2019

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FIGURES

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Figure 2 – Site-wide Groundwater Elevation Contour Map under Pumping Conditions - November 2018

Figure 3 – On-site Remaining Eastern Storm Sewer Rehabilitation

Figure 4 –Off-site Manhole Survey

ATTACHMENT

Attachment 1 - Eastern and Western Diversion Chamber Sediment Analytical Reports

ACRONYMS AND ABBREVIATIONS

CCTV	closed-circuit television
cDCE	cis-1,2-dichloroethene
COC	constituent of concern
CSM	conceptual site model
DCE	dichloroethene
GLWA	Great Lakes Water Authority
GSi	groundwater/surface water interface
LTP	Livonia Transmission Plant
µg/L	microgram per liter
MDEQ	Michigan Department of Environmental Quality
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
QAPP	Quality Assurance Project Plan
RespAP	Response Activity Plan
RI	Remedial Investigation
TCE	trichloroethene
tDCE	trans-1,2-dichloroethene
TDL	target detection limit
VC	vinyl chloride

1 INTRODUCTION

Arcadis of Michigan LLC (Arcadis) has prepared the following Utility Corridor Response Activity Plan (RespAP) on behalf of Ford Motor Company (Ford) for the Livonia Transmission Plant (LTP) site (the site). The site layout is included as **Figure 1**. This document describes the Remedial Investigation (RI) activities that will be used to comprehensively assess the potential exposure pathway via the utility corridors in accordance with the Consent Decree effective July 27, 2017 (No: 2:1712372-GAD-RSW) and satisfies Section 6.7a response activity plan for conducting an RI.

The proposed response activities will address the comments provided by the Michigan Department of Environmental Quality (MDEQ) in the letter dated August 30, 2018 Response Activity Plan-Remedial Investigation. The scope of work outlined within this RespAP will systematically assess the potential exposure pathway related to the utility corridors on site and off site. Additional phases of investigation might be required based on the first phase of activities outlined in this RespAP.

This RespAP is organized to describe on-site and off-site RI activities. On-site activities will include:

- Sediment sampling of the eastern and western diversion chambers
- Survey of manhole rims, inverts, and sumps of storm and sanitary sewers
- Rehabilitation of the remaining storm sewers and manholes related to the eastern storm sewer system.

Additional off-site RI activities include:

- Survey of manhole rims, inverts, and sumps of storm and sanitary sewers
- Sampling of a select number of manholes pending the installation of the shallow groundwater monitoring wells.

The constituents of concern (COCs) for the site, as defined by the Consent Decree, include:

- Trichloroethene (TCE)
- Tetrachloroethene (PCE)
- 1,1-dichloroethene (DCE)
- Cis-1,2-dichloroethene (cDCE)
- Trans-1,2-dichloroethene (tDCE)
- Vinyl chloride (VC)
- 1,4-Dioxane.

The target detection limits (TDLs) for COCs in soil, groundwater, and vapor are also defined in the Consent Decree. Due to analytical limitations, a separate RespAP requesting a TDL change for TCE and VC in residential groundwater was submitted to the MDEQ on November 21, 2017 and approved on December 20, 2017. Therefore, the goal of off-site groundwater criteria for TCE and VC was changed to a TDL of 1.0 microgram per liter ($\mu\text{g/L}$).

RESPONSE ACTIVITY PLAN – UTILITY CORRIDOR EVALUATION

This document provides a framework for the proposed RI activities. Investigation sampling, routine monitoring, and laboratory analyses methodology to be employed during the RI are presented in two Quality Assurance Project Plans (QAPPs; Arcadis 2017b, Arcadis 2017c), prepared and submitted to the MDEQ in August 2017. QAPP addenda may be prepared and submitted to MDEQ for review and approval should an investigation method require additional description.

Schedule

The additional activities proposed that were not included in the RI RespAP submitted to the MDEQ on April 13, 2018 but are described herein will begin upon approval from the MDEQ. A schedule is provided below to show the approximate duration of the proposed response activities. The status of previous activities discussed in the RespAP is also provided below.

Scope Define Below	Duration	Status
On Site		
Comprehensive Storm and Sanitary Sewer Systems Sampling	July 2017	Completed
Closed-Circuit Televised Sanitary Sewer System	August and September 2017	Completed
Closed-Circuit Televised Remaining Eastern Storm Sewer System	March and April 2018	Completed
Manhole, Invert, and Sump Survey	December 2018- January 2019	Completed
Sediment Sampling – Eastern and Western Diversion Chamber	Quarterly	Completed
Monthly Compliance Sampling – Sample Location 2	Monthly	Ongoing
On-site Remaining Eastern Storm Sewer System Rehabilitation	Pending	Pending
Off Site		
Manhole, Invert, and Sump Survey	December 2018	Completed
Shallow Monitoring Well Installation and Groundwater Sampling	1Q2019	Ongoing

2 ON-SITE REMEDIAL INVESTIGATIONS

On-Site Utility Corridors

From October 2016 to July 2017, Arcadis oversaw the rehabilitation of more than 95% of the eastern storm sewer system on site, as documented in the conceptual site model (CSM; Arcadis 2017a). In July 2017, water and sediment samples were collected during and after the rehabilitation to evaluate the presence or absence of chlorinated VOCs and polychlorinated biphenyls (PCBs) within the storm system. In addition, water and sediment samples were collected within the sanitary sewers and process waste lines for the same purpose (Arcadis 2017a).

In August and September 2017, a portion of the sanitary sewer system and the western diversion chamber were jetted and cleaned as described in the Third Quarter 2017 Progress Report.

RESPONSE ACTIVITY PLAN – UTILITY CORRIDOR EVALUATION

Additional closed-circuit television (CCTV) survey work and a survey of manhole structures were completed in March and April 2018 for the remainder of the eastern storm sewer systems where COC impacts have been identified. The CCTV was used to determine if additional pipe rehabilitation is warranted. In December 2018 and January 2019, Arcadis surveyed the additional manhole rims, inverts, and sumps associated with the remaining eastern storm sewer system in an effort to understand the relationship between depth of storm sewers to elevation of groundwater on site. The findings of the storm and sanitary sewer survey indicate that a majority of the infrastructure piping is submerged and/or in contact with groundwater. A detailed survey of the on-site sewer systems is provided on **Figure 1** and groundwater elevations across the site are provided on **Figure 2**.

It is important to note that the storm sewers discharge to the eastern and the western diversion chambers (see **Figure 1** for the locations) and discharge during base flow conditions to the Great Lakes Water Authority (GLWA) treatment facility. The GLWA just recently extended the discharge permit allowing Ford to discharge to the GLWA until September 1, 2022. As part of this permit, Ford is required to sample at location SL-2, which is composed of sanitary, industrial wastewater, remediated groundwater, and stormwater and located just north of Plymouth Road. This compliance point is sampled monthly and contains contents from the storm sewer and sanitary sewer systems exiting the LTP property. To date, discharge from the Ford facility has not exceeded the allowable discharge of total toxic organic compounds, which is 2.13 µg/L.

In addition to the monthly compliance sampling, sediment samples were collected from the eastern and western diversion chambers in December 2018 to determine if COCs were present. Analytical results of the sediment were non-detect. The analytical report is located in **Attachment 1**.

Groundwater elevations from existing monitoring well locations will be compared to the elevations of adjacent sanitary and storm sewer system pipes and manholes to determine if existing wells are appropriate for monitoring groundwater adjacent to site utilities. Based on a preliminary review of the utility depth relative to the site geology, it is unlikely that fill placed as part of sewer construction has significantly greater permeability than the surrounding native soils. Therefore, it is also unlikely that fill material placed around utilities create a preferential pathway or otherwise affect groundwater flow and contaminant transport in a significant way. The focus of the additional evaluation will be to determine if the concentrations of COCs adjacent to storm and sanitary pipes and structures present a risk of groundwater infiltration and help prioritize additional storm and sanitary rehabilitation efforts. A comprehensive review will occur once all groundwater delineation monitoring wells have been installed as part of the RI RespAP.

In July 2017, a comprehensive storm sewer sampling event was conducted to determine if COCs were still present within the eastern storm sewer system. Results indicated a significant decrease in COCs downstream in the eastern storm sewer system, but COCs were identified in the northwest corner of the property; details of that sampling event are included in the Third Quarter Progress Report (Arcadis 2017b). As presented in the RI RespAP, the northwest corner of the plant is being evaluated and groundwater is being delineated to determine if there is a potential source. Pending that investigation and discussions with the MDEQ, Ford will rehabilitate the remaining ~4,200 linear feet of storm sewer and subsequent manholes, identified on **Figure 3**.

Off-Site Utility Corridors

In December 2018, Arcadis surveyed 105 manholes related to both storm and sanitary sewer systems located off site to the east of the site to determine the depths of manhole rims, inverts, and sumps located in Alden Village, Belden Court, Rosati Avenue, and Stark Road. The survey will aid in the evaluation of the off-site sewer network in relation to shallow groundwater. Survey elevations are provided on **Figure 4**.

As described in the MDEQ Response to the RespAP Vapor Intrusion Evaluation dated August 30, 2018, the MDEQ is requesting the installation of the extensive shallow water monitoring well network to define the extent of the VC impacts in shallow groundwater that resides off site. Once groundwater samples have been collected to define the nature and extent of the impacts, any additional sampling required will be discussed with the MDEQ. Concentrations observed thus far off site do not exceed groundwater surface water (GSI) interface criteria for VC.

3 CLOSING

The goal of the RespAP outlined above is to document how Ford will address the data gaps identified in the CSM (Arcadis 2017a), address the MDEQ comments to the RI RespAP, and complete other activities that will be required for a comprehensive RI report in accordance with the Consent Decree. The work will be completed in phases to provide the appropriate data for decision making in accordance with the RI schedule contained herein. Quarterly progress and RI report(s) will be submitted to MDEQ throughout the RI process.

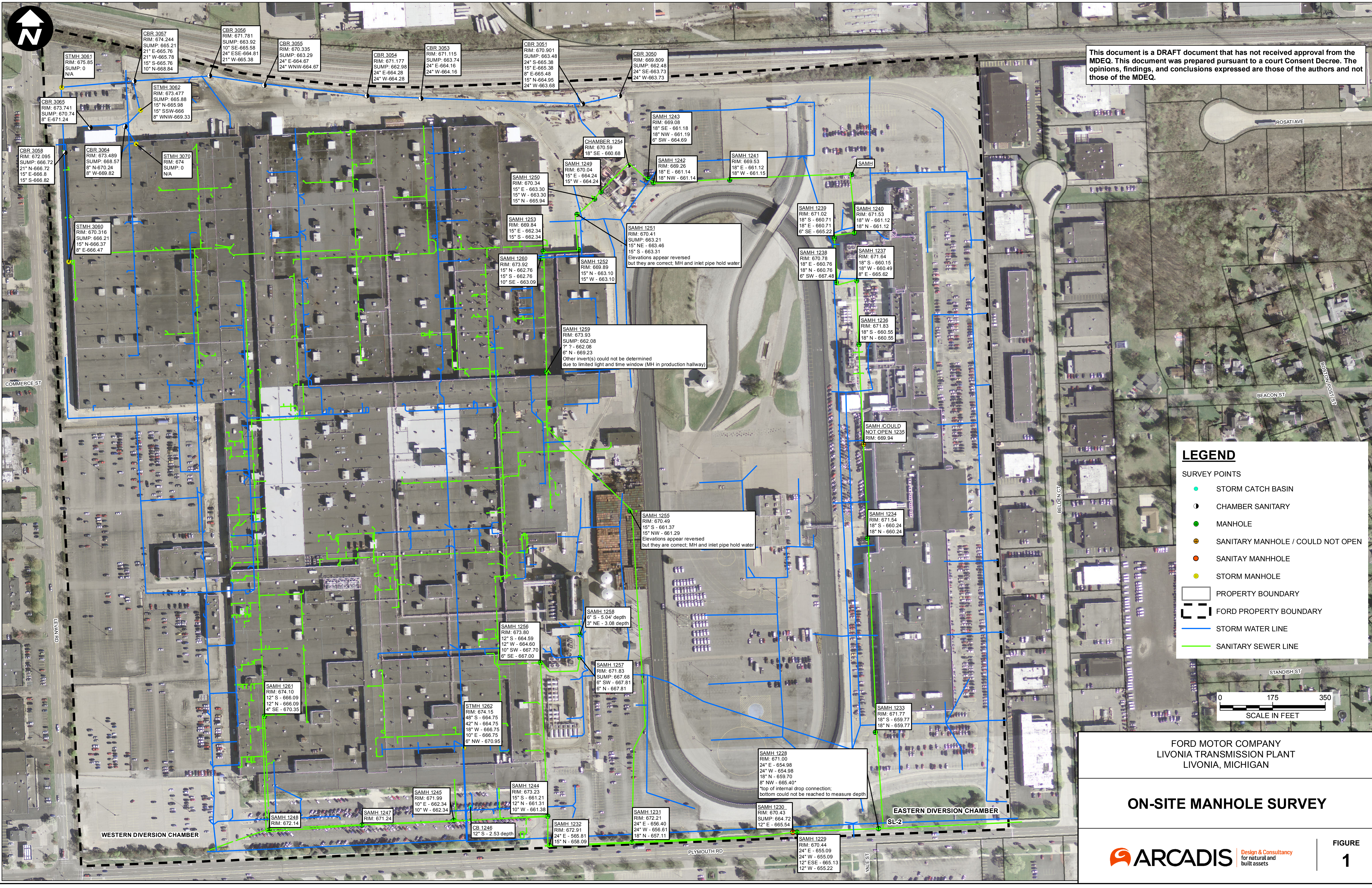
4 REFERENCES

- Arcadis of Michigan LLC (Arcadis). 2017a. Conceptual Site Model. Livonia Transmission Plant. August.
- Arcadis. 2017b. Quality Assurance Project Plan – On-Site. Livonia Transmission Plant, Livonia, Michigan. August.
- Arcadis. 2017c. Quality Assurance Project Plan – Off-Site. Livonia Transmission Plant, Livonia, Michigan. August.

FIGURES



CITY: Novi; DIV: ENV; DE: MG; PIC: R. ELLIS; PM: K. HINSKEY; PROJECT NUMBER: M001322.0001; COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl; Z:\GIS\Projects_ENV\Novi\Brighton_Mi\FordLivonia\GIS\2019-2021\Manhole_Survey_02272019.mxd; PLOTTED: 2/27/2019 11:57:19 AM BY: memiller



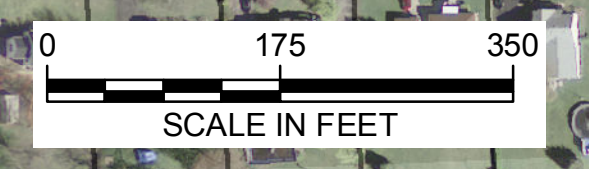
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LEGEND

SURVEY POINTS

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

- PROPERTY BOUNDARY
- FORD PROPERTY BOUNDARY
- STORM WATER LINE
- SANITARY SEWER LINE



FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

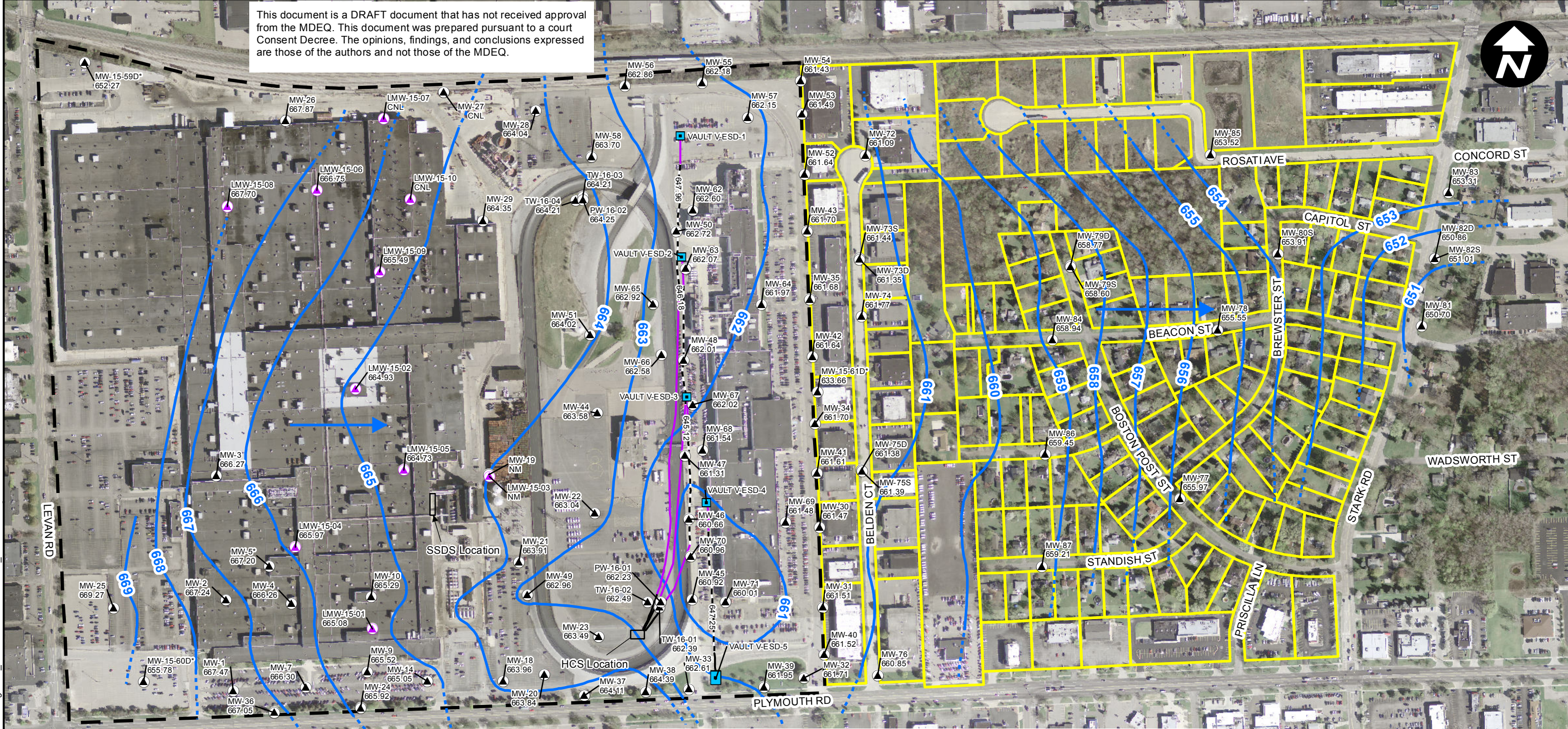
ON-SITE MANHOLE SURVEY



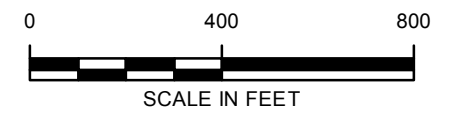
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CITY: NOVI DIV: ENV DB: MG PIC: R. ELLIS PM: K. HINSKEY TR: P. CURRY PROJECT NUMBER: M1001454.0004.00001 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Z:\GISProjects\ENV\NoviBrighton_MIFordLivonia\GIS\docs\2019-01\Figure 3_Site Wide GWE Contour_01302019.mxd PLOTTED: 7/30/2019 4:20:23 PM BY: msmiller



- NOTES:
1. ALL ELEVATIONS COLLECTED ON NOVEMBER 19, 2018 AND MEASURED FROM TOP OF WELL CASING.
 2. ALL ELEVATIONS ARE REFERENCED TO A MEAN SEA LEVEL DATUM AND ARE IN UNITS OF FEET ABOVE SEA LEVEL.
 3. WHERE NESTED WELLS ARE PRESENT, THE DEEP WELL IS USED FOR CONTOURING PURPOSES.
 4. *WELL NOT USED TO CREATE CONTOURS.
 5. LNAPL = LIGHT NON-AQUEOUS PHASE LIQUID
 6. NM = NOT MEASURED, CNL = COULD NOT LOCATE
 7. HYDRAULIC CONTROL SYSTEM PERFORMANCE MONITORING WELLS RE-SURVEYED IN OCTOBER 2017. MONITORING WELLS RE-SURVEYED IN NOVEMBER 2017. MW-5 AND MW-21 WERE UNABLE TO BE RE-SURVEYED DURING THE NOVEMBER 2017 EVENT DUE TO ACCESS. HYDRAULIC CONTROL SYSTEM HORIZONTAL WELLS RE-SURVEYED IN SEPTEMBER 2018.
 8. MONITORING WELLS WITH LNAPL PRESENT IN THEM HAVE HAD THEIR GROUNDWATER ELEVATIONS CORRECTED TO ACCOUNT FOR THE LNAPL.
 9. MDEQ = MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 10. HDPE = HIGH-DENSITY POLYETHYLENE
 11. SSDS = SUB-SLAB DEPRESSURIZATION SYSTEM
 12. HCS = HYDRAULIC CONTROL SYSTEM



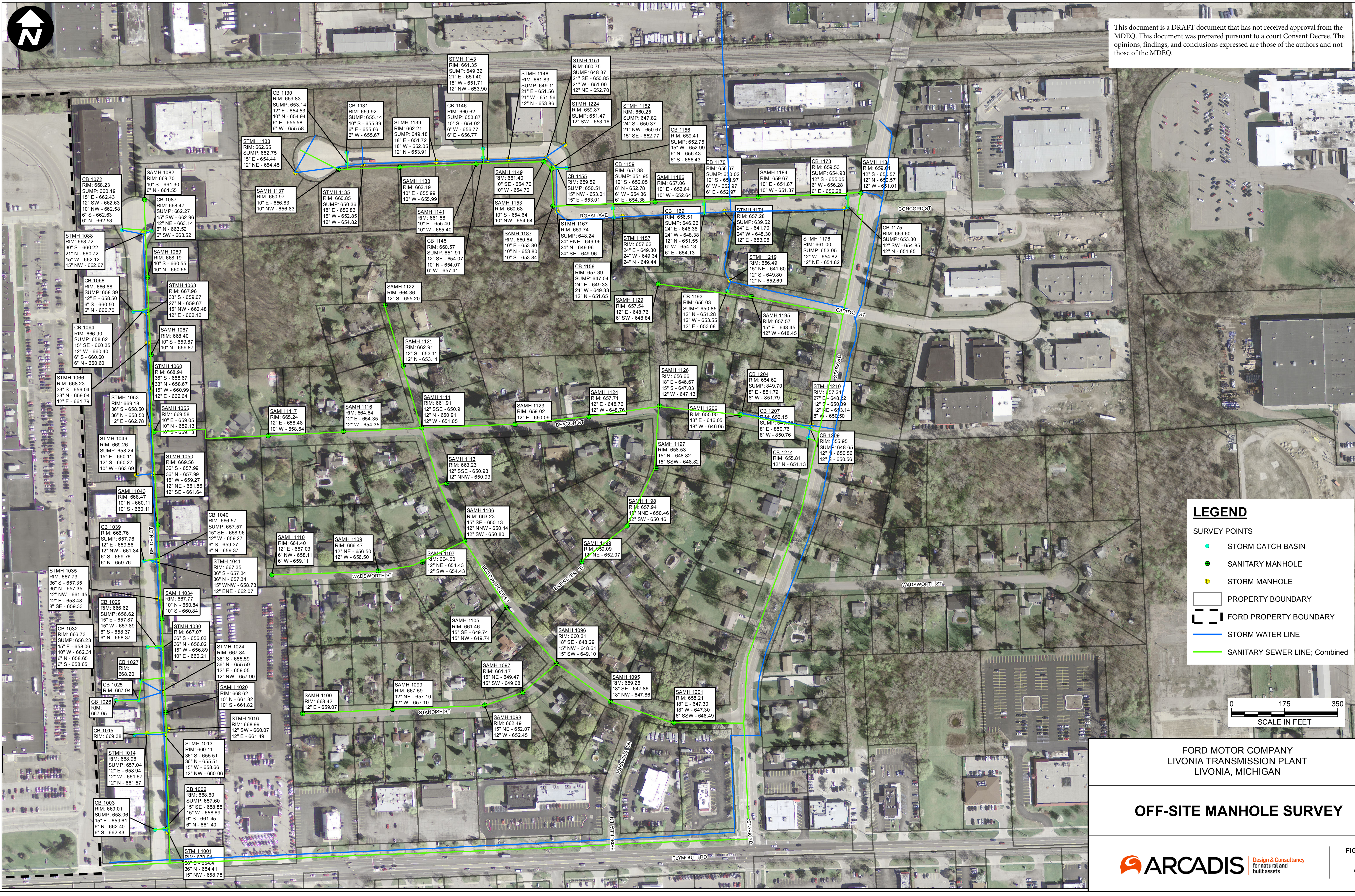
LEGEND

- MONITORING WELL
- LNAPL MONITORING WELL
- VAULT (2 FT x 2 FT)
- VAULT (4 FT x 6 FT)
- WELL SCREEN (4-INCH SDR-11 HDPE, CUSTOM SLOTTED)
- WELL BLANK CASING (4-INCH SDR-11 HDPE)
- WELL BLANK CASING (6-INCH SDR-11 HDPE)
- (662.85) GROUNDWATER ELEVATION
- GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED; CONTOUR INTERVAL = 1.0 FT)
- APPARENT GROUNDWATER FLOW DIRECTION
- PROPERTY BOUNDARIES
- FORD PROPERTY BOUNDARY

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

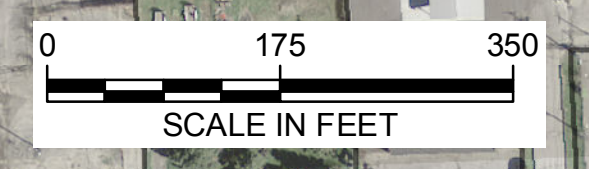
**SITE-WIDE GROUNDWATER ELEVATION
CONTOUR MAP UNDER PUMPING CONDITIONS
NOVEMBER 2018**

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LEGEND

- STORM CATCH BASIN
- SANITARY MANHOLE
- STORM MANHOLE
- ▭ PROPERTY BOUNDARY
- - - FORD PROPERTY BOUNDARY
- STORM WATER LINE
- SANITARY SEWER LINE; Combined



FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

OFF-SITE MANHOLE SURVEY



CITY: Novi, DIV: ENV, DE: MG, PIC: R. ELLIS, PM: K. HINSKEY, PROJECT NUMBER: M001322.0001, COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl, Z:\GIS\Projects_Env\Novi\Brighton_MilFord\Livonia\GIS\2019\02\Manhole_Survey_Offsite.mxd, PLOTTED: 2/26/2019 3:48:23 PM, BY: msemiller

CITY: Novi, DIV: ENV, DE: MG, PIC: R. ELLIS, PM: K. HINSKEY, PROJECT NUMBER: M001322.0001, COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl, ZIGS/Project: ENWNoviBrighton_MilFordLivoniaGISdocs2019-02/Manhole_Zoom_Onsite.mxd, PLOTTED: 2/27/2019 8:26:58 AM, BY: msmliller



STMH 3061
RIM: 675.85
SUMP: 0
N/A

CBR 3057
RIM: 674.244
SUMP: 665.21
21" E-665.76
21" W-665.78
15" S-665.76
10" N-668.84

CBR 3056
RIM: 671.781
SUMP: 663.92
10" SE-665.58
24" ESE-664.81
21" W-665.38

CBR 3055
RIM: 670.335
SUMP: 663.29
24" E-664.67
24" WNW-664.67

CBR 3054
RIM: 671.177
SUMP: 662.98
24" E-664.28
24" W-664.28

CBR 3053
RIM: 671.115
SUMP: 663.74
24" E-664.16
24" W-664.16

CBR 3051
RIM: 670.901
SUMP: 663.48
24" S-665.38
15" E-665.38
8" E-665.48
15" N-664.95
24" W-663.68

CBR 3050
RIM: 669.809
SUMP: 662.48
24" SE-663.73
24" W-663.73

CBR 3065
RIM: 673.741
SUMP: 670.74
8" E-671.24

STMH 3062
RIM: 673.477
SUMP: 665.88
15" N-665.98
15" SSW-666
8" WNW-669.33

CBR 3058
RIM: 672.095
SUMP: 666.72
21" N-666.72
15" E-666.8
15" S-666.82

CBR 3064
RIM: 673.489
SUMP: 668.57
8" N-670.24
8" W-669.82

STMH 3070
RIM: 674
SUMP: 0
N/A

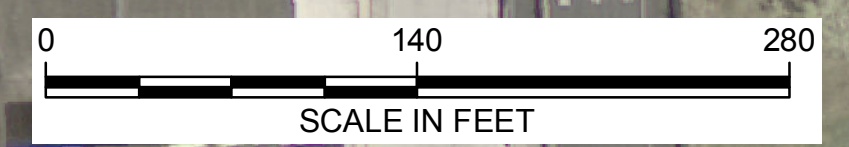
STMH 3060
RIM: 670.316
SUMP: 666.21
15" N-666.37
8" E-666.47

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LEGEND

SURVEY POINTS

- CHAMBER
- SANITARY MANHOLE
- ▭ PROPERTY BOUNDARY
- ▭ FORD PROPERTY BOUNDARY
- REMAINING EASTERN STORM SEWER



FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

**ON-SITE REMAINING EASTERN
STORM SEWER REHABILITATION**

ATTACHMENT 1

Eastern and Western Diversion Chamber Sediment Analytical Reports



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-105951-1

Client Project/Site: Ford LTP Livonia MI - E203631
Revision: 1

For:

ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey



Authorized for release by:
1/3/2019 10:48:23 AM

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Designee for

Michael DelMonico, Project Manager I
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Job ID: 240-105951-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203631

**Report Number: 240-105951-1
Revised**

Revised 1/3/19. Per the client request the Trip Blank sample results will be removed from the report.

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 12/18/2018 8:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9° C.

VOLATILE ORGANIC COMPOUNDS

Samples EDC_SEDIMENT_121418 (240-105951-1) and WDC_SEDIMENT_121418 (240-105951-2) were analyzed for volatile organic compounds in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 12/25/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples EDC_SEDIMENT_121418 (240-105951-1) and WDC_SEDIMENT_121418 (240-105951-2) were analyzed for percent solids in accordance with ASTM Method D2216-80. The samples were analyzed on 12/19/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Job ID: 240-105951-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

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Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Method	Method Description	Protocol	Laboratory
8260B MI	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
Moisture	Percent Moisture	EPA	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396



Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-105951-1	EDC_SEDIMENT_121418	Solid	12/14/18 09:54	12/18/18 08:45
240-105951-2	WDC_SEDIMENT_121418	Solid	12/14/18 10:37	12/18/18 08:45

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Client Sample ID: EDC_SEDIMENT_121418

Lab Sample ID: 240-105951-1

No Detections.

Client Sample ID: WDC_SEDIMENT_121418

Lab Sample ID: 240-105951-2

No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Client Sample ID: EDC_SEDIMENT_121418

Lab Sample ID: 240-105951-1

Date Collected: 12/14/18 09:54

Matrix: Solid

Date Received: 12/18/18 08:45

Percent Solids: 81.9

Method: 8260B MI - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	57	U	57	23	ug/Kg	☼	12/24/18 15:31	12/25/18 15:12	1
1,4-Dioxane	18000	U	18000	1600	ug/Kg	☼	12/24/18 15:31	12/25/18 15:12	1
cis-1,2-Dichloroethene	57	U	57	13	ug/Kg	☼	12/24/18 15:31	12/25/18 15:12	1
Tetrachloroethene	57	U	57	26	ug/Kg	☼	12/24/18 15:31	12/25/18 15:12	1
trans-1,2-Dichloroethene	57	U	57	14	ug/Kg	☼	12/24/18 15:31	12/25/18 15:12	1
Trichloroethene	57	U	57	16	ug/Kg	☼	12/24/18 15:31	12/25/18 15:12	1
Vinyl chloride	46	U	46	17	ug/Kg	☼	12/24/18 15:31	12/25/18 15:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	72		53 - 155	12/24/18 15:31	12/25/18 15:12	1
4-Bromofluorobenzene (Surr)	74		48 - 151	12/24/18 15:31	12/25/18 15:12	1
Dibromofluoromethane (Surr)	72		49 - 138	12/24/18 15:31	12/25/18 15:12	1
Toluene-d8 (Surr)	76		49 - 147	12/24/18 15:31	12/25/18 15:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	81.9		0.1	0.1	%			12/19/18 15:43	1
Percent Moisture	18.1		0.1	0.1	%			12/19/18 15:43	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Client Sample ID: WDC_SEDIMENT_121418

Lab Sample ID: 240-105951-2

Date Collected: 12/14/18 10:37

Matrix: Solid

Date Received: 12/18/18 08:45

Percent Solids: 80.9

Method: 8260B MI - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	57	U	57	23	ug/Kg	☼	12/24/18 15:31	12/25/18 15:35	1
1,4-Dioxane	18000	U	18000	1500	ug/Kg	☼	12/24/18 15:31	12/25/18 15:35	1
cis-1,2-Dichloroethene	57	U	57	13	ug/Kg	☼	12/24/18 15:31	12/25/18 15:35	1
Tetrachloroethene	57	U	57	25	ug/Kg	☼	12/24/18 15:31	12/25/18 15:35	1
trans-1,2-Dichloroethene	57	U	57	14	ug/Kg	☼	12/24/18 15:31	12/25/18 15:35	1
Trichloroethene	57	U	57	16	ug/Kg	☼	12/24/18 15:31	12/25/18 15:35	1
Vinyl chloride	45	U	45	17	ug/Kg	☼	12/24/18 15:31	12/25/18 15:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	67		53 - 155	12/24/18 15:31	12/25/18 15:35	1
4-Bromofluorobenzene (Surr)	70		48 - 151	12/24/18 15:31	12/25/18 15:35	1
Dibromofluoromethane (Surr)	67		49 - 138	12/24/18 15:31	12/25/18 15:35	1
Toluene-d8 (Surr)	71		49 - 147	12/24/18 15:31	12/25/18 15:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	80.9		0.1	0.1	%			12/19/18 15:43	1
Percent Moisture	19.1		0.1	0.1	%			12/19/18 15:43	1

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Method: 8260B MI - Volatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA	BFB	DBFM	TOL
		(53-155)	(48-151)	(49-138)	(49-147)
240-105951-1	EDC_SEDIMENT_121418	72	74	72	76
240-105951-2	WDC_SEDIMENT_121418	67	70	67	71
240-105951-2 MS	WDC_SEDIMENT_121418	71	75	73	74
240-105951-2 MSD	WDC_SEDIMENT_121418	80	86	81	82
LCS 240-361585/2-A	Lab Control Sample	71	77	71	74
MB 240-361585/1-A	Method Blank	75	81	75	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Method: 8260B MI - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-361585/1-A
Matrix: Solid
Analysis Batch: 361592

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 361585

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	40	U	40	16	ug/Kg		12/24/18 15:31	12/25/18 14:06	1
1,4-Dioxane	13000	U	13000	1100	ug/Kg		12/24/18 15:31	12/25/18 14:06	1
cis-1,2-Dichloroethene	40	U	40	9.0	ug/Kg		12/24/18 15:31	12/25/18 14:06	1
Tetrachloroethene	40	U	40	18	ug/Kg		12/24/18 15:31	12/25/18 14:06	1
trans-1,2-Dichloroethene	40	U	40	10	ug/Kg		12/24/18 15:31	12/25/18 14:06	1
Trichloroethene	40	U	40	11	ug/Kg		12/24/18 15:31	12/25/18 14:06	1
Vinyl chloride	32	U	32	12	ug/Kg		12/24/18 15:31	12/25/18 14:06	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	75		53 - 155	12/24/18 15:31	12/25/18 14:06	1
4-Bromofluorobenzene (Surr)	81		48 - 151	12/24/18 15:31	12/25/18 14:06	1
Dibromofluoromethane (Surr)	75		49 - 138	12/24/18 15:31	12/25/18 14:06	1
Toluene-d8 (Surr)	79		49 - 147	12/24/18 15:31	12/25/18 14:06	1

Lab Sample ID: LCS 240-361585/2-A
Matrix: Solid
Analysis Batch: 361592

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 361585

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,1-Dichloroethene	1000	929		ug/Kg		93	57 - 139
1,4-Dioxane	20000	20300		ug/Kg		102	51 - 140
cis-1,2-Dichloroethene	1000	780		ug/Kg		78	74 - 123
Tetrachloroethene	1000	793		ug/Kg		79	76 - 120
trans-1,2-Dichloroethene	1000	734		ug/Kg		73	71 - 133
Trichloroethene	1000	815		ug/Kg		81	73 - 126
Vinyl chloride	1000	799		ug/Kg		80	52 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	71		53 - 155
4-Bromofluorobenzene (Surr)	77		48 - 151
Dibromofluoromethane (Surr)	71		49 - 138
Toluene-d8 (Surr)	74		49 - 147

Lab Sample ID: 240-105951-2 MS
Matrix: Solid
Analysis Batch: 361592

Client Sample ID: WDC_SEDIMENT_121418
Prep Type: Total/NA
Prep Batch: 361585

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
1,1-Dichloroethene	57	U	1180	1010		ug/Kg	☼	86	36 - 150
1,4-Dioxane	18000	U	23500	25400		ug/Kg	☼	108	62 - 158
cis-1,2-Dichloroethene	57	U	1180	963		ug/Kg	☼	82	50 - 128
Tetrachloroethene	57	U	1180	928		ug/Kg	☼	79	20 - 151
trans-1,2-Dichloroethene	57	U	1180	850		ug/Kg	☼	72	44 - 141
Trichloroethene	57	U	1180	976		ug/Kg	☼	83	25 - 148
Vinyl chloride	45	U	1180	893		ug/Kg	☼	76	31 - 148

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Method: 8260B MI - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-105951-2 MS
Matrix: Solid
Analysis Batch: 361592

Client Sample ID: WDC_SEDIMENT_121418
Prep Type: Total/NA
Prep Batch: 361585

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	71		53 - 155
4-Bromofluorobenzene (Surr)	75		48 - 151
Dibromofluoromethane (Surr)	73		49 - 138
Toluene-d8 (Surr)	74		49 - 147

Lab Sample ID: 240-105951-2 MSD
Matrix: Solid
Analysis Batch: 361592

Client Sample ID: WDC_SEDIMENT_121418
Prep Type: Total/NA
Prep Batch: 361585

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	Limits	RPD	RPD	Limit
	Result	Qualifier		Result	Qualifier						RPD		
1,1-Dichloroethene	57	U	1190	1170		ug/Kg	☼	98		36 - 150	15		40
1,4-Dioxane	18000	U	23800	23900		ug/Kg	☼	100		62 - 158	6		40
cis-1,2-Dichloroethene	57	U	1190	1060		ug/Kg	☼	89		50 - 128	9		40
Tetrachloroethene	57	U	1190	1050		ug/Kg	☼	88		20 - 151	12		40
trans-1,2-Dichloroethene	57	U	1190	978		ug/Kg	☼	82		44 - 141	14		40
Trichloroethene	57	U	1190	1110		ug/Kg	☼	94		25 - 148	13		40
Vinyl chloride	45	U	1190	1020		ug/Kg	☼	86		31 - 148	14		37

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	80		53 - 155
4-Bromofluorobenzene (Surr)	86		48 - 151
Dibromofluoromethane (Surr)	81		49 - 138
Toluene-d8 (Surr)	82		49 - 147

Method: Moisture - Percent Moisture

Lab Sample ID: 240-105885-A-11 DU
Matrix: Solid
Analysis Batch: 360876

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD	Limit
	Result	Qualifier	Result	Qualifier					
Percent Solids	97.4		97.5		%			0.09	20
Percent Moisture	2.6		2.5		%			3	20

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

GC/MS VOA

Prep Batch: 361585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-105951-1	EDC_SEDIMENT_121418	Total/NA	Solid	5030B	
240-105951-2	WDC_SEDIMENT_121418	Total/NA	Solid	5030B	
MB 240-361585/1-A	Method Blank	Total/NA	Solid	5030B	
LCS 240-361585/2-A	Lab Control Sample	Total/NA	Solid	5030B	
240-105951-2 MS	WDC_SEDIMENT_121418	Total/NA	Solid	5030B	
240-105951-2 MSD	WDC_SEDIMENT_121418	Total/NA	Solid	5030B	

Analysis Batch: 361592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-105951-1	EDC_SEDIMENT_121418	Total/NA	Solid	8260B MI	361585
240-105951-2	WDC_SEDIMENT_121418	Total/NA	Solid	8260B MI	361585
MB 240-361585/1-A	Method Blank	Total/NA	Solid	8260B MI	361585
LCS 240-361585/2-A	Lab Control Sample	Total/NA	Solid	8260B MI	361585
240-105951-2 MS	WDC_SEDIMENT_121418	Total/NA	Solid	8260B MI	361585
240-105951-2 MSD	WDC_SEDIMENT_121418	Total/NA	Solid	8260B MI	361585

General Chemistry

Analysis Batch: 360876

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-105951-1	EDC_SEDIMENT_121418	Total/NA	Solid	Moisture	
240-105951-2	WDC_SEDIMENT_121418	Total/NA	Solid	Moisture	
240-105885-A-11 DU	Duplicate	Total/NA	Solid	Moisture	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1

Client Sample ID: EDC_SEDIMENT_121418

Date Collected: 12/14/18 09:54

Date Received: 12/18/18 08:45

Lab Sample ID: 240-105951-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	360876	12/19/18 15:43	ACR	TAL CAN

Client Sample ID: EDC_SEDIMENT_121418

Date Collected: 12/14/18 09:54

Date Received: 12/18/18 08:45

Lab Sample ID: 240-105951-1

Matrix: Solid

Percent Solids: 81.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			361585	12/24/18 15:31	LAM	TAL CAN
Total/NA	Analysis	8260B MI		1	361592	12/25/18 15:12	TJL1	TAL CAN

Client Sample ID: WDC_SEDIMENT_121418

Date Collected: 12/14/18 10:37

Date Received: 12/18/18 08:45

Lab Sample ID: 240-105951-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	360876	12/19/18 15:43	ACR	TAL CAN

Client Sample ID: WDC_SEDIMENT_121418

Date Collected: 12/14/18 10:37

Date Received: 12/18/18 08:45

Lab Sample ID: 240-105951-2

Matrix: Solid

Percent Solids: 80.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			361585	12/24/18 15:31	LAM	TAL CAN
Total/NA	Analysis	8260B MI		1	361592	12/25/18 15:35	TJL1	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-105951-1


Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19 *
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19 *
Kentucky (UST)	State Program	4	58	02-23-19 *
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19 *
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19 *
West Virginia DEP	State Program	3	210	12-31-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Canton

Client Information				Lab Pmt: Michael DelMonico, Michael DelMonico				
Company: ARCADIS U.S., Inc.				Carrier Tracking No(s): 240-56785-24377.1				
Client Contact: Angela DeGrandis				COC No. 240-56785-24377.1				
Address: 28550 Cabot Drive Suite 500				Page: Page 1 of 1				
City: Novi				Job #:				
State, Zip: MI, 48377				Analysis Requested				
Phone:				Preservation Codes:				
PO #: MI001454.0008, 4900041				A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Waik K - EDTA L - EDA Other:				
WO #: Cadena #, E203631				Total Number of containers				
Project #: 24015353								
SSOW#:								
Site: LIVONIA, MI								
Sample Identification			Special Instructions/Note:					
Sample ID	Sample Date	Sample Time	Sample Type (C-comp, G-grab)	Preservation Code	Matrix (W-water, S-solid, O-organic, A-air)	Field Filtered Sample (Yes or No)	Form MS/MSD (Yes or No)	
EDC - Sediment - 121418	12/14/18	0954	G		Solid	N	N	
WDC - Sediment - 121418	12/14/18	1037	G		Solid	N	N	
TRP BLANKS					Water			
 240-105951 Chain of Custody							Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	
							<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab	
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological							<input type="checkbox"/> Archive For _____ Months	
Deliverable Requested: I, II, III, IV, Other (specify)				Special Instructions/QC Requirements:				
Empty Kit Relinquished by:				Time:				
Relinquished by: RACHEL STERN / Posh / ARCADIS				Date: 12/14/2018 15:15				
Relinquished by: CHRISTINA WILSON / Posh / ARCADIS				Date: 12/17/2018 14:33				
Relinquished by: [Signature]				Date: 12/17/18 1518				
Custody Seals Intact: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Custody Seal No.:				
Relinquished by: RACHEL STERN / Posh / ARCADIS				Date: 12/14/2018 15:15				
Relinquished by: CHRISTINA WILSON / Posh / ARCADIS				Date: 12/17/2018 14:33				
Relinquished by: [Signature]				Date: 12/17/18 845				
Custody Seals Intact: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Custody Seal No.:				
Relinquished by: RACHEL STERN / Posh / ARCADIS				Date: 12/14/2018 15:15				
Relinquished by: CHRISTINA WILSON / Posh / ARCADIS				Date: 12/17/2018 14:33				
Relinquished by: [Signature]				Date: 12/17/18 845				
Custody Seals Intact: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Custody Seal No.:				
Relinquished by: RACHEL STERN / Posh / ARCADIS				Date: 12/14/2018 15:15				
Relinquished by: CHRISTINA WILSON / Posh / ARCADIS				Date: 12/17/2018 14:33				
Relinquished by: [Signature]				Date: 12/17/18 845				
Custody Seals Intact: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Custody Seal No.:				



TestAmerica Canton Sample Receipt Form/Narrative

Login # : 185951

Canton Facility

Client Arcadis Site Name Cooler unpacked by: Cooler Received on 10/18/18 Opened on 10/18/18 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 114 Foam Box Client Cooler Box Other Packing material used: Bubble Wrap Foam Plastic Bag None Other COOLANT: Wet Ice Blue Ice Dry Ice Water None

- 1. Cooler temperature upon receipt IR GUN# IR-8 (CF -0.2 °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C IR GUN #36 (CF +0°C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 0.9 °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC854592
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? Larger than this Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # N/A Yes No
16. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving: VOAs Oil and Grease TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: RC

18. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired. Sample(s) were received in a broken container. Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory. Time preserved: Preservative(s) added/Lot number(s):



January 03, 2019

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: MI001454.0002/3/4.00002/2B/3B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: TestAmerica - North Canton
Laboratory submittal: 105951-1
Sample date: 2018-12-14
Report received by CADENA: 2019-01-03
Initial Data Verification completed by CADENA: 2019-01-03

There were no significant QC anomalies or exceptions to report.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

2 Soil sample(s) were analyzed for GCMS VOC parameter(s).

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at <http://clms.cadenaco.com/index.cfm>.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

SAMPLING AND ANALYSIS SUMMARY

CADENA Project ID: E203631

Laboratory: TestAmerica-North Canton

Laboratory Submittal: 105951-1

Lab Sample ID	Sample ID	Collection Date (mm/yy/dd)	Collection Time (hh:mm:ss)	Volatile Organics by GCMS	Comment
2401059511	EDC_SEDIMENT_121418	12/14/2018	9:54:00	X	
2401059512	WDC_SEDIMENT_121418	12/14/2018	10:37:00	X	

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 105951-1

Sample Name:	EDC_SEDIMENT_121418	WDC_SEDIMENT_121418
Lab Sample ID:	2401059511	2401059512
Sample Date:	12/14/2018	12/14/2018

Analyte	Cas No.	Report		Valid		Report		Valid	
		Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier

GC/MS VOC

OSW-8260B

1,1-Dichloroethene	75-35-4	ND	57	ug/kg	---	ND	57	ug/kg	---
1,4-Dioxane	123-91-1	ND	18000	ug/kg	---	ND	18000	ug/kg	---
cis-1,2-Dichloroethene	156-59-2	ND	57	ug/kg	---	ND	57	ug/kg	---
Tetrachloroethene	127-18-4	ND	57	ug/kg	---	ND	57	ug/kg	---
trans-1,2-Dichloroethene	156-60-5	ND	57	ug/kg	---	ND	57	ug/kg	---
Trichloroethene	79-01-6	ND	57	ug/kg	---	ND	57	ug/kg	---
Vinyl chloride	75-01-4	ND	46	ug/kg	---	ND	45	ug/kg	---

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