



Environmental Quality Office
Sustainability, Environment & Safety
Engineering

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April 13, 2018

Paul Owens
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Subject: Ford's Response Activity Plan for the Ford Livonia Transmission Plant
36200 Plymouth Road; Livonia, Wayne County, Michigan
MDEQ Site ID No. 82002970

Paul:

I write in response to your letter dated March 9, 2018 and to memorialize discussions with the MDEQ on April 5, 2018 related to Ford Motor Company's ongoing work around its Livonia plant. Ford has operated in Livonia for over sixty years and is committed to addressing those environmental conditions associated with its operations. Since 2015, Ford has reviewed the investigation plans and results associated with our ongoing response actions with the MDEQ. During this time, we have worked together to ensure that the investigation and delineation was completed properly.

Ford agrees that the Consent Decree entered between MDEQ and Ford governs the parties' relationship and provides the foundational outline for each party's obligations. The Consent Decree requires Ford to prepare investigation and then remediation plans in successive steps, with each document approved or disapproved in full before subsequent work begins. (*See, e.g.*, Consent Decree sections 6.7, 6.8, & 13.3.). The Consent Decree also provides for public comment prior to initiation of final remedies. (*Id.* Section 6.11.)

Your March 9 letter appears to deviate from this plan by directing Ford to "proceed to take the actions and perform the response activities not directly related to the deficient portions of the Submission" subject to stipulated penalties. When we discussed this paragraph at the April 5 meeting, MDEQ indicated that this paragraph was "boilerplate" and that MDEQ did not intend through the incorporation of this language to reorder the relationship outlined in the Consent Decree. Likewise, the March 9 letter includes language to the effect that "[i]ndoor air sampling

is not regulated by the MDEQ” even though the Consent Decree itself includes action levels for indoor air. As we discussed, Ford and MDEQ agree that indoor air sampling is an appropriate line of evidence to consider as part of the broader investigatory plan around Livonia.

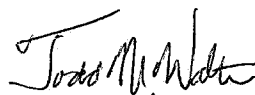
Further, the March 9 letter discusses what amounts to a presumptive remedy for vapor intrusion issues. (“ . . . MDEQ’s requirement is to investigate and determine risk using sub-slab soil gas samples and mitigate if a known or potential risk is shown.”). The Consent Decree indicates that remedy implementation should follow data-gathering. (*See, e.g.* Section 6.1(d).). At present, even though Ford has taken 607 groundwater samples and 152 vapor samples, it is unaware of any building where “presumptive” remedies are appropriate. Instead, where data exists, vapor intrusion is not known to be an issue. Ford believes it is appropriate to continue the investigation activities outlined by the Consent Decree and to remediate all issues identified as material by the data.

At the April 5 meeting, Ford and MDEQ discussed Ford’s Response Activity Plan and the investigation activities that preceded it. Ford believes that the discussions at the April 5 meeting were positive and allowed for a clear path forward to approval for Ford’s investigation to proceed. I attach a technical memorandum prepared by Arcadis which addresses each point raised in MDEQ’s March 9 letter in detail.

We look forward to continuing our work around Livonia and our productive relationship with MDEQ.

If you have any questions, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Todd M. Walton". The signature is written in a cursive style with a large initial "T".

Todd M. Walton
Manager, Global Site Assessment & Remediation

Paul Owens
April 13, 2018
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cc: Mr. Kristoffer Hinskey – Arcadis
Mr. Brian Negele – Michigan Department of Attorney General
Mr. Travis Boeskool – MDEQ
Mr. Darren Bowling – MDEQ
Ms. Cyndi Mollenhour – MDEQ
Ms. Beth Vens – MDEQ
Mr. Brandon Alger – MDEQ

To:
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From:
Joe Quinnan – Arcadis
Mitch Wacksman - Arcadis

Date:
April 13, 2018

Arcadis Project No.:
MI001322.0001

Subject:
Livonia Transmission Plant
Response to Michigan Department of Environmental Quality Comments to
the Disapproval of the Response Activity Plan
36200 Plymouth Road, Livonia, Wayne County, Michigan
MDEQ Site ID No. 82002970

Arcadis of Michigan LLC (Arcadis) has prepared this response to the letter received from the Michigan Department of Environmental Quality (MDEQ) on March 16, 2018, regarding the Response Activity Plan (RespAP) for: Ford Livonia Transmission Plant to Ford Motor Company (Ford). The document also includes details discussed with the MDEQ staff during the April 5, 2018 meeting at the MDEQ office, located in Warren, Michigan.

The RespAP for the Facility at 36200 Plymouth Road, Livonia and associated Area of Concern has been disapproved for the following reasons:

Comment #1 Groundwater Sampling: In the MDEQ 2013 VI Guidance Document, Section 3.2.2, Page 3-4, indicates, "Contaminants at the water table, rather than deeper contamination, are responsible for causing potential VI problems. Hence, monitoring wells used to make VI evaluations should be screened across the air-water interface. Therefore, it is important to make sure that the well screens are not submerged below the water table". Based on MDEQ's review of the 04 monitoring report, 17 of 20 off-site monitoring wells do not intersect the water table. To adequately evaluate the VIAP pathway from groundwater the screens need to intersect the water table. Using the existing data to screen out homes may be premature. Please address how or if this will be resolved in the RespAP.

Response #1 Groundwater Sampling: *Ford has built a robust conceptual site model (CSM) for the entire area of concern (AOC) using multiple lines of evidence including large groundwater and*

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soil gas data sets (Arcadis 2017). The footprint of the groundwater impacts has been mapped using a high-resolution investigation that included 250 groundwater samples collected at 82 locations using the industry-accepted method referred to as vertical aquifer profiling. Twenty off-site monitoring wells were installed based on these results, following the submittal of the "Work Plan for Off-site Groundwater Monitoring and Plume Stability Evaluation in the Residential Neighborhood East of the Ford Motor Company Livonia Transmission Plant and Soil Vapor Evaluation Work Plan for Commercial Area and Residential Neighborhood East of Ford Motor Company Livonia Transmission Plant" in April 2017. The MDEQ reviewed the work plans and provided comments and guidance submitted via email on April 28, 2017 (Groundwater Monitoring Plan) and May 26, 2017 (Vapor Intrusion Work Plan). Soil gas has been collected from 43 monitoring points throughout the residential community and across the footprint of the off-site groundwater impacts. Soil gas has been sampled from both single-depth and multi-depth soil gas monitoring points, as described in the response to the next comment.

Additional shallow monitoring wells screened across the soil-water interface are not proposed because quarterly soil gas samples are actively being collected voluntarily by Ford Motor Company.

The initial vertical aquifer profiling completed off site included discrete samples at the top of the water table, as well as deeper through the saturated zone, to better understand groundwater impacts at discrete intervals. Results from the investigation indicated that vinyl chloride was primarily present in the deeper saturated zone, while clean water was primarily present within the shallower zones across most of the neighborhood. The off-site vinyl chloride impacts in groundwater are presented on Figure 1, the clean water lens is presented on Figure 2.

Based on the analytical results, and the presence of high-permeability zones, monitoring wells were installed along the core of the off-site vinyl chloride plume to intersect zones of highest impact and provide sentry wells for delineation and to demonstrate the presence of the clean water lens. Details regarding monitoring well installation were presented in a work plan submitted to MDEQ in April 2017. Several monitoring wells (e.g., MW-73S, MW-75S, MW-79S, MW-80S, and MW-82S) are installed in the first 5 feet of saturated material, but were not specifically designed to split the water table or be used for soil gas sampling. The monitoring well network currently installed is designed to evaluate the natural attenuation and extent of vinyl chloride impacts off site, as presented on Figure 3. The specific function of monitoring wells in the off-site area is detailed below.

- Monitor Shallow Groundwater - MW-73S, MW-75S, MW-79S, MW-80S and MW-82S
- Monitor Highest CVOC Concentrations – MW-72, MW-73D, MW-74, MW-75D, MW-79D, MW-85
- Monitor Perimeter – MW-76, MW-77, MW-78, MW-81, MW-82D, MW-83, MW-84, MW-86, MW-87

Comment #2 Soil-gas sampling: As indicated by Paragraph 6.6(b)(i) of the CD, the "... Response Activity Plan to assess VI risks to identify any unacceptable human health risks from volatilization to indoor air of COCs within the AOC"

- Page 4-1 of the MDEQ's VI Guidance recommends installing soil-gas wells, "at least five feet below grade with at least a two-foot separation above the water table." At this site, groundwater is shallow enough that soil-gas wells may not yield reliable data to characterize soil-gas. The RespAP needs revisions with consideration to the following:

Response #2 Soil-gas sampling: *Soil gas is an important line of evidence in evaluating the VIAP across the site, therefore Ford elected to collect a robust soil-gas dataset and provided a work plan to the MDEQ with proposed methods before installing the points (Arcadis 2017). This soil-gas characterization has been used to inform the next steps of the off-site work. Ford has voluntarily collected a very large soil-gas dataset from across the neighborhood over the last 4 years and believes this dataset is sufficient to continue building a robust CSM regarding the VIAP. The locations and depths of samples were selected using professional judgment to best characterize the conditions at the site and include multiple depth horizons. These ideas were presented to MDEQ during a September 7, 2016 meeting and in an April 20, 2017 work plan. While the 2013 MDEQ VI Guidance provides some information on soil-gas sampling depth and methods, this document is strictly guidance and is not promulgated (i.e., law). In some off-site areas, the water table is shallow, and placing all samples at 5 feet below ground with at least a 2-foot separation from groundwater is not possible. Out of the 43 soil vapor monitoring points installed, 24 sample screens are 4 feet bgs or deeper (seven samples at 5 feet or deeper), and 19 sample screens are less than 4 feet bgs.*

Several technical items were employed to ensure that representative soil-gas samples were collected as described below. Based on the results of the sampling, and due to the implementation of the measures described below, Ford believes that the results are representative and provide an accurate interpretation of off-site soil vapor conditions.

- *Tracer gas testing has been conducted during three rounds of soil gas sampling using a helium tracer at each location before sampling. Methods for tracer testing were the same as those presented in MDEQ VI Guidance Appendix F and in line with industry-accepted standards. As discussed in the MDEQ VI Guidance, a tracer gas can be used to verify that soil-gas samples are from the installed point and not from leaks in the sampling train. No unacceptable helium leak test results were noted during the three rounds of soil-gas sample collection through December 2017. Samples were deemed acceptable, as all exhibited concentrations of helium in purged soil gas less than 10% of the initial shroud concentration of helium, as presented in the MDEQ VI guidance. Helium tracer testing results from the three rounds of soil-gas sampling are included in Table 1.*
- *Very small screened intervals (1" screen within a 3" sand pack) were installed to allow for a thicker bentonite seal to the ground surface at each location.*
- *Soil-gas sampling has been conducted very slowly (i.e., 20-minute sample using a 1-liter canister) to avoid short-circuiting. This flow rate is four times slower than the maximum 200 ml/min included in the 2013 MDEQ VI Guidance. MDEQ suggests samples be collected at or below 200 ml/min "to minimize the potential for vacuum extraction of contaminants from the soil phase."*
- *Carbon dioxide and oxygen have been measured from each sample point directly after each round of sample collection. Concentrations of oxygen are slightly depressed from atmospheric conditions (i.e., 1 to 2% below atmospheric), while concentrations of carbon dioxide are slightly elevated (i.e., 3 to 6%). This is as expected due to the influence of microbial respiration in the vadose zone, which consumes oxygen and produces carbon dioxide (USEPA 2015¹). Carbon dioxide and oxygen concentrations from exterior soil-gas samples are presented in Table 2.*

Three rounds of soil gas sampling have been conducted off site through December 2017. None of the soil vapor results have exceeded RIASL levels for target COCs under the CD:

¹ United States Environmental Protection Agency (USEPA). 2015. Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites. June.

- As summarized in the CSM (Arcadis 2017), vinyl chloride (VC) was not detected in any of the soil vapor samples. All VC detection limits were below the RIASL for residential soil vapor provided in the Consent Decree. TCE was detected in three samples, but all detections were below the RIASL for soil vapor. To provide additional data, groundwater samples were collected from beneath soil vapor monitoring points at nine residential properties where a basement was known to be present from the building survey. The results for vinyl chloride are consistent with groundwater monitoring for the area, and indicate that the extent of VC in groundwater has successfully been defined (Table 16). VC was only detected at concentrations above the 2013 MDEQ VI Guidance value for VC of 2 µg/L in one groundwater sample. At the location of the VC exceedance, a collocated shallower sample was non-detect for VC, indicating the presence of a clean water lens. TCE was not detected at concentrations above the detection limit of 1 µg/L in any of the groundwater samples collected as part of this effort. Off-site screening levels from the Consent Decree for both VC and TCE are below the laboratory reporting limit.
- As summarized in the first quarterly progress report, submitted to the MDEQ on November 22, 2017, soil-gas sampling conducted in September 2017 did not exhibit soil vapor results above the RIASL for VC or TCE. None of the soil gas samples exhibited detectable concentrations of VC, and reporting limits were all below the RIASL. Two soil vapor samples exhibited detectable concentrations of TCE at SVMP-17 and SVMP-27 that were below the RIASL; all TCE reporting limits were below the RIASL (See Table 7 and Figures 15 through 18 in the quarterly report).
- As summarized in the second quarterly progress report (Arcadis 2018), soil-gas sampling conducted in November 2017 did not exhibit detectable concentrations of VC or TCE in soil vapor at any of the locations, and all detection limits were below the RIASL. Note that SVMP-17, which previously exhibited detectable levels of TCE below the RIASL, could not be sampled due to saturated port conditions (See Table 5 and Figures 10 through 13 in the quarterly report).

The results of three rounds of soil-gas sampling consistently indicate that the soil vapor results are below RIASL levels for target COCs. Based on the results of the helium tracer testing, carbon dioxide, and oxygen sampling, Ford believes that the results are representative and provide an accurate interpretation of off-site soil vapor conditions. As discussed in the RespAP, site-specific VIAP evaluations are proposed to complete the assessment consistent with paragraph 6.6 (b)(i) of the CD as discussed in the following response to comments.

Comment #2 (Off-site)

- **Off-site:** Ford should determine how to assess VIAP with the shallow groundwater table - building information will be critical in assessing VIAP properly. For example, if a slab on grade structure is present, they might be able to use vapor pins for assessing VIAP

Response #2: Ford has submitted a multiple-lines-of-evidence approach in the RespAP to evaluate off-site properties for the VIAP using building-specific investigations as suggested in the 2013 MDEQ VI Guidance. This process is data-driven and includes all properties located within 100 feet of groundwater where VC is present at concentrations above 1 µg/L at any depth. Ford started this evaluation process by reviewing groundwater and soil-gas data collected off site. The next step was to evaluate building construction in the off-site area. Ford has reviewed tax assessor records, which include building construction information, for approximately 65 off-site properties that were initially included in the VIAP evaluation. Ford also sent these 65 property owners a survey requesting additional information about their building. These surveys were sent out on December 7, 2016. On March 1, 2017, Arcadis went door-to-door to deliver construction surveys at 24 properties east of the LTP where the initial construction survey was not returned. To date, 23 residential surveys and ten commercial surveys were received back by Ford and

evaluated. Additional building inspection work is proposed from each property within the residential community and in the commercial properties located on Belden Court and Rosati Drive to gain reliable information on the construction of each property.

As indicated in the RespAP, the next step in the off-site VIAP evaluation is the collection of building-specific samples from each property that Ford is able to access following the methods suggested in the 2013 MDEQ VI Guidance.

Proposed site-specific sampling at both residential and commercial properties will provide additional lines of evidence for evaluating the VIAP on a building-specific basis. The proposed plan will include sampling of the following: sub-slab soil gas, indoor air, outdoor/ambient air, groundwater near buildings and water from sumps (if present), and indoor air samples from crawl spaces (if present).

- *Installation of Geoprobe® sounding to assess site-specific depth to groundwater relative to site-specific structures. If conditions are such that groundwater would likely be in contact with subsurface structures, a temporary monitoring well would be installed to enable water table groundwater quality sampling.*
- *Sub-slab soil gas samples will be collected from the lowest level of each building (i.e., basement or first floor) at the appropriate sample density recommended in Section 5.3 of the 2013 MDEQ VI Guidance, following methods in Appendix F.7 of the 2013 MDEQ VI Guidance.*
- *Indoor air samples will be collected from the lowest habitable level of each building following Section 5.5 of the 2013 MDEQ VI Guidance, following methods in Appendix F.4 of the 2013 MDEQ VI Guidance.*
- *Outdoor/ambient air samples representative of each building or group of neighboring buildings will be collected concurrent with indoor air samples following methods presented in Appendix F.4 of the 2013 MDEQ VI Guidance.*
- *Water samples from floor sumps will be collected if sumps are present and contain water.*
- *Crawl space indoor air samples will be collected from crawl spaces of homes using the methods presented in Appendix F.4 of the 2013 MDEQ VI Guidance.*

Comment #2 (Off-site)

- **Off-site:** For structures with basements, there may be immediate need to assess mitigation since groundwater could potentially be in contact with the basement floor, unless data can reliably prove otherwise.

Response #2: *Comment acknowledged. As discussed above, Ford is conducting a systematic evaluation of the VIAP to meet the requirements of Paragraph 6.6 (b)(i) of the CD. Should sub-slab sampling not be possible due to the presence of water immediately below the floor slab, multiple lines of evidence will be relied upon to evaluate the VIAP. Potential lines of evidence for use include the following:*

- *Collect nearby groundwater samples from existing monitoring wells.*
- *If conditions are such that groundwater would likely be in contact with subsurface structures, install a temporary monitoring well to enable water table groundwater quality sampling.*
- *Collect water analytical samples (if a sump is present).*
- *Collect indoor air samples.*
- *Review the results of sub-slab soil gas samples collected at neighboring properties.*

All activities described above are to identify unacceptable health risks from volatilization to indoor as described and satisfies section 6.6 (b)(i) of the CD. In the event that mitigation is necessary, the appropriate RAP will be submitted to the MDEQ per section 6.6 (b)(ii) of the CD.

Comment #2 Continues

- o **On-site:** There is LNAPL beneath most of the LTP building. The LNAPL plume should be delineated or presumed to be present under the entire LTP building. If the plume is under the entire LTP building, the entire building will need to be mitigated.

Response #2: The LNAPL beneath the plant has broadly been delineated, except in local areas that were identified within the CSM (Arcadis 2017) and proposed in the RespAP. Delineation has been conducted using the industry-accepted method of laser-induced fluorescence (LIF), through the sampling of monitoring wells, and by collection and evaluation of saturated soil samples. The approach described in the RespAP to complete the LNAPL delineation will be used. In the event that mitigation is necessary, the appropriate RAP will be submitted to the MDEQ per section 6.6 (b)(ii) of the CD.

Comment #2 Continues

- o Have other lines of evidence beyond an oil shake test been performed? This needs to be included to assess if NAPL is present or not. Multiple lines of evidence are needed.

Response #2: As outlined in the CSM, lines of evidence for LNAPL presence/absence include a comprehensive LIF survey across the building footprint, LNAPL saturated soil sampling with shake tests, installation of 10 LNAPL monitoring wells to verify LNAPL thickness and provide locations to conduct initial LNAPL mobility and recoverability testing, and laboratory analysis of eight LNAPL samples to evaluate LNAPL composition. The LNAPL wells, soil sampling, and sub-slab samples have verified the findings of the LIF survey. A summary of the LNAPL evaluation completed to date is provided below.

- LNAPL samples were collected and analyzed for density, viscosity, and interfacial tension from the eight monitoring wells (LMW-15-01, LMW-15-02, LMW-15-03, LMW-15-04, LMW-15-05, LMW-15-06, LMW-15-09, and LMW-15-10) containing LNAPL. LNAPL fluid properties often support LNAPL mobility evaluations and can support inferences regarding LNAPL type and origin. Results are detailed below:
 - o Density ranged from 0.86 to 0.91 grams per cubic centimeter.
 - o Kinematic viscosity values measured at 55 degrees Fahrenheit (°F; an approximate representative groundwater temperature) ranged from 16.2 to 333 centistokes (cSt).
 - o Interfacial tension values for the LNAPL ranged from 4.4 to 12.4 dynes/centimeter.
- Whole oil analysis (C3-C36) was performed on the eight monitoring wells. The analysis provides a high-resolution chromatogram that can be used to identify phase-separated hydrocarbon type and extent of weathering. Results are detailed in the CSM, but in general:
 - o The eastern portion of the LNAPL plume consists mainly of lighter oils that are more like mineral oil or light cutting oil.
 - o LNAPL in the central and western portions of the LNAPL plume consists of heavier oil like cutting oils, quench/heat transfer oils, or lubricating oils.
- Transmissivity testing was completed at the site. The testing and evaluation were conducted in general accordance with the ASTM E-2856 Standard Guide for Estimation of LNAPL Transmissivity. The MDEQ has established an LNAPL transmissivity threshold recovery of 0.5 ft²/day to define recovery to the maximum extent practical. Transmissivity testing results at several areas within the LNAPL body are above the 0.5 ft²/day, which indicates that LNAPL recovery is possible. Details on the test results are detailed within the CSM.

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Additional work is proposed to complete the delineation of the LNAPL in the northwest portion of the LTP as indicated in the RespAP. Future RespAP may include additional LNAPL characterization once the source areas have been better defined.

Comment #2 Continues

- For proposed VIAP samples, collect one at the top of the water table, directly below the LNAPL. Take note of LNAPL thickness, where present.

Response #2: *During the April 5, 2018 meeting with the MDEQ, it was determined and agreed upon among all parties that the MDEQ made a mistake when writing this comment and agreed that water was not to be sampled on top of the LNAPL, mainly because water does not rest on top of LNAPL. Soil-gas samples have been collected from 70 sub-slab monitoring point locations that reside within the NAPL footprint. As described above, in lieu of collecting water data, sub-slab soil-gas samples have been collected to evaluate conditions above the LNAPL.*

Comment #2 continues

- As additional data becomes available, this needs to remain current, according to Paragraph 6.6(a)(ii)(H).

Response #2: *Comment acknowledged. The CSM will be updated following each phase of Response Activity. This will occur in conjunction with Response Activity Plan deliverables.*

Comment #2 continues

- **Sitewide:** Oxygen and carbon dioxide concentration measurements will be collected when sub-slab soil-gas samples are obtained.

Response #2: *Oxygen and carbon dioxide concentrations have been recorded from both interior sub-slab soil gas (data presented in Table 3) and exterior soil-gas samples collected from the site (data presented in Table 2). Oxygen and carbon dioxide sampling will continue during future sub-slab sampling activities. Additional details will be provided in an updated CSM.*

Comment #3 Indoor Air: Indoor air sampling is not regulated by the MDEQ. Our expectation is that sub-slab soil gas needs be below screening levels and if it exceeds or is not possible to sample (due to groundwater in contact), that mitigation plans would be expected in the Response Activity Plan under Paragraph 6.6(b)(ii). The MDHHS may request or provide alternative direction, and this should be followed, but MDEQ's requirement is to investigate and determine risk using sub-slab soil gas samples and mitigate if a known or potential risk is shown.

Response #3: *Comment acknowledged. Ford is conducting a systematic evaluation of the VIAP off site and considers indoor air sampling a valuable line of evidence in this process. Indoor air sampling methods are presented in the 2013 MDEQ VI Guidance, and indoor air screening values were presented to Ford in the Consent Decree. As discussed with MDEQ during the April 5, 2018 meeting, Ford proposes to collect indoor air samples from off-site properties and will consider them as one of many lines of evidence in evaluating the VIAP. In the event that mitigation is necessary, the appropriate RAP will be submitted to the MDEQ per section 6.6 (b)(ii) of the Consent Decree.*

MDHHS staff have been provided a copy of the RespAP and were present via telephone for the March 22, 2018 meeting conducted at the MDEQ office in Warren, MI. Ford has not received any comments or communications from the MDHHS on the indoor air sampling proposed in the RespAP and discussed at the meeting.

Comment #4 Scheduling: Paragraphs 6.6(b)(ii) and 6.7(a)(iii) of the CD discuss scheduling. Specifically, 6.6(b)(ii) requires, "The Response Activity Plan for mitigation of VI risks shall include a

schedule for the implementation of necessary mitigation ... Implementation schedules for conducting the response activities and for submission of progress reports and an IRA report." For the other RespAP, 6.7(a)(iii) requires, "Preliminary implementation schedules for conducting the response activities and for submission of progress reports and an RI Report." The MDEQ expects at a minimum this schedule should include discussion on which tasks will begin first and what date they will begin, which tasks will run concurrently and when they will begin, an estimate on when RI tasks will be completed, and when an RI-Report will be submitted. Immediate attention should be given to obtaining access and getting into homes as quickly as possible, to sample soil-gas. Every effort needs to be made to obtain access and sample homes as quickly as reasonably possible, even if this requires multiple mobilizations.

- It should not take seven months to delineate off-site groundwater.
- The "Unknown" timeframe provided for off-site VIAP evaluation is not acceptable.
- Additional detail related to scheduling can be found in Paragraphs 6.6(b)(i), 6.6(c)(i), and 6.7(a)(iii) of the CD.

Response #4: *Comment acknowledged. Scheduling of off-site activities, including response activities, progress reports, interim remedial activity reports, and remedial investigation report, will follow the Consent Decree as defined by section 6.6 (c)(i) and 6.7 (a)(iii). The schedule will reflect and follow the process presented in the Consent Order in which the MDEQ reserves the right to send site documents out for public comment, per section 6.12 of the Consent Decree. The schedule for completion of the investigation required in section 6.6 (b)(i) of the Consent Decree will be submitted to the MDEQ within the VI RespAP and will detail the process used for acquiring access and conducting site-specific investigation and evaluation. The schedule for the VI RespAP will provide the necessary actions to gain access to off-site properties that have filed a lawsuit against Ford and property owners who have not. In either case, Ford will focus immediate attention on gaining access as defined in sections 6.6 (c)(ii) and 7.2 of the Consent Decree, followed by coordinating with the property owner to conduct the work detailed in the VI RespAP as soon as access has been granted.*

The execution of remedial activities associated with Section 6.7 of the Consent Decree (Remedial Investigation) will follow the same procedure presented above for activities associated with 6.6 (b)(i). Where access is not needed, Ford will provide a schedule that is in accordance with section 6.7 (b) and begin work within 30 days of the approved ResAP. Ford understands that, per Section 6.12 of the Consent Decree, the MDEQ reserves the right to request public comment on the VI RespAP and/or the RI RespAP. Per the Consent Decree, the public comment period will be available for no less than 30 days. During the April 15, 2018 meeting with the MDEQ, it is understood that either the VI RespAP and/or the RI RespAP will be sent out for public comment. Implementation schedules have been prepared to include this proposed public comment period.

Comment #5 Access: The proposed RespAP contains a section about obtaining access. The proposed plan for obtaining access for off-site properties in the RespAP should comply with the requirements of the CD.

- Paragraph 6.6(H)(c)(ii) of the CD requires a plan for obtaining access to properties not owned by Ford to perform the required investigations and response activities. According to the CD, Ford has 60 days after approval of the RespAP to secure access or take the necessary judicial action to secure access. Ford needs to provide to the MDEQ documentation that such judicial action has been filed in the court of the appropriate jurisdiction no later than 60 days after the MDEQ's approval of the RespAP. Section 7.2 also has requirements for access that should be complied with.
- Upon receipt of access, the plan should specify the time from when access is received to when work will be conducted and completed. This should be communicated to the MDEQ and residents granting access.

Response #5:

For clarification, the MDEQ response states paragraph 6.6(H)(c)(ii) as it relates to acquiring access. Section 6.6(c)(ii) of the Consent Decree is the correct section related to acquiring access to properties not owned by Ford.

Ford will coordinate with off-site properties owners as soon as possible following receipt of a signed access agreement at each property. It is unknown at this time how many signed access agreements Ford will receive back from property owners. Ford is committed to completing the scope of work detailed in the VI RespAP as soon as the agreements have been received. A maximum of five properties would be completed weekly. A detailed schedule will be provided to MDEQ and updated accordingly as access agreements are received. All efforts will be coordinated with the property owners.

Comment #5 continues

- Provide MDEQ and residents a specific time from when access is received to when work will be conducted and completed.

Response #5: *Ford is committed to completing the scope of work detailed in the VI RespAP as soon as possible following receipt of a signed access agreement. Ford will provide a 10-day notification to the MDEQ for any sampling activities conducted in the area of concern as described within the Consent Decree. Building evaluation and sampling at each property will take up to 5 days to complete.*

Comment #5 continues

- Due to concerns with groundwater and soil-gas data sets, excluding homes from the area of investigation and a need for an access request at this point may be premature. A presumptive approach should be used for requesting access until reliable and accurate data is available to determine the extent of the vapor plume and the 100' lateral exclusion zone.

Response #5: *Based on the foregoing responses to questions about groundwater delineation and soil-gas sampling, and discussions with MDEQ during the April 5, 2018 meeting, Ford does not agree with the MDEQ's characterization that the interpretations are inaccurate or unreliable. Consistent with the 2013 MDEQ VI Guidance, the VI assessment plan will focus on parcels included within the 100' lateral exclusion zone. The 100' lateral exclusion zone footprint was mapped using the highest concentration groundwater sample result from multiple vertical aquifer profile sampling intervals at each location. The lack of soil-gas sample results above the RIASLs, based on three rounds of testing through November 2017, indicates that the clean water lens is present, but is continually being evaluated. However, site-specific VIAP evaluations are proposed to complete the assessment consistent with paragraph 6.6 (b)(i) as discussed in the response to comments #2. Additional properties will be added to the evaluation as needed based on the results of site-specific evaluations conducted off site.*

Comment #5 continues

- VIAP needs to be assessed for every receptor and potential receptor. This means assessing VIAP on vacant parcels, unless a deed restriction including VIAP language for future buildings is planned or present for that parcel. Some properties were not included in the RespAP - based on available data it is premature to exclude these properties.

Response #5: *The vacant parcels will be evaluated using site-specific groundwater and soil gas sampling per section 3.4.6 of the 2013 MDEQ VI Guidance.*

Comment #6 Visual Property Survey: *Related to access, during door to door delivery and requests for access, Ford representatives should conduct a limited property survey of each*

property. This could help in determining basement presence if no access or information is provided. Are there basement windows? Elevated porch? Wells in front yard? This should respect resident privacy and be limited to only that which can be observed from the public Right of Way.

Response #6: *Comment acknowledged.*

Comment #7 Abandoning Wells: In Paragraph 6.7(a)(viii) of the CD, Remedial investigation must include, "a list of any on-site and off-site drinking water or irrigation wells within the impacted areas, and plans for their abandonment, if determined appropriate." This information should be included in the RespAP.

Response #7: *Comment acknowledged. When each property is assessed and visited, when an access agreement has been received, Ford representatives will ask property owners about the presence of wells and visually inspect for the potential well from inside and outside of the resident's home and or structures. As detailed in the CSM, Ford has identified one drinking water well located east of Stark Road. Ford also sent out surveys requesting information about any potential water wells on private residential properties on December 7, 2016. On March 1, 2017, Arcadis went door-to-door to deliver construction surveys at 24 properties east of the LTP where the initial construction survey was not returned. Thirty-six residential construction surveys were sent out to private property owners east of the LTP. To date, 23 surveys were received and evaluated. Twenty-eight surveys were sent out to commercial property owners; ten were received back to date. If irrigation or drinking wells are identified, Ford will notify the MDEQ and City of Livonia.*

Comment #8 Emergency Response: Paragraph 6.6(d)(iii) requires that if data indicates an immediate vapor intrusion risk is present, immediate action will be taken in consultation with the MDEQ. Section 9.1 also requires the immediate undertaking of "all appropriate actions to prevent, abate, or minimize such release, threat of release, or exacerbation". Within the RespAP, identify that this will be part of the IRA should any data collected indicate an immediate risk to human health from volatilization of COCs into indoor air within the AOC.

Response #8: *Ford will continue to comply with section 6.6(d)(iii) and 9.1 of the Consent Decree, and data will be shared with MDEQ as it becomes available.*

Comment #9 Waste Management: Per Paragraph 6.7(a)(vi), of the CD, Remedial Investigation must include, "A description of the nature and amount of waste materials expected to be generated during the performance of response activities and the name and location of the facilities the Defendant proposes to use for the offsite transfer, storage, and treatment or disposal of those waste materials." The "Waste Management" sections of the RespAP should include estimated amount of waste materials.

Response #9: *Comment acknowledged. It is estimated that approximately 100 to 115 drums of waste will be produced as part of the RespAP. All investigation-derived waste that is generated off site will be moved to Ford property and managed properly.*

Comment #10 Boring Density/Adaptivity: The RespAP should clearly indicate the intent of adaptive borings based on field observation and screening. Also, some proposed boring/monitor well densities may not provide adequate characterization of groundwater and soil-gas. As required in the CD, Ford should conduct the investigation to the extent required to delineate contamination.

Response #10: *Comment acknowledged. The RespAP will clarify criteria used to evaluate the need for adaptive boring locations. The on-site investigation will use a mobile laboratory to analyze groundwater*

samples to provide real-time data for field decision making. This adaptive approach is common practice during site investigation. In general, if concentrations observed with the mobile laboratory are above applicable Part 201 criteria (i.e., soil or groundwater), or the non-residential Volatilization to Indoor Air Criteria (VIAC) provided by the MDEQ, additional borings will be completed to refine the delineation. Potential source area borings will be completed at nominal 50- to 100-foot spacing with adaptive borings used to reduce the spacing and complete step-outs as necessary to refine the delineation. If delineation to criteria is not achieved within the number of borings proposed as part of the RespAP, the results will be discussed with the MDEQ to include a discussion of the benefit (or lack thereof) of completing additional source characterization in a given PS area.

VAP borings proposed for the northern property boundary and off site to the north and northwest of the site will be completed using a nominal 100- to 200-foot spacing. The on-site borings will be completed first. These results, along with the existing borings along the northern property boundary and northwest of the site, will be used to select off-site VAP boring locations to complete the delineation to the north and northwest. Monitoring wells will then be placed based on the revised CSM at locations best suited to provide for future monitoring and delineation, consistent with the approach used for past off-site investigations. The permanent monitoring well network at each area will be discussed with MDEQ based on the findings of the VAP borings.

Comment #10 (continued): Additional borings will likely be required for the following areas and should be included in the revised RespAP:

- **North of LTP:** The proposed spacing of 900' is not adequate.
- **Northeast of LTP:** The proposed spacing of 1000-1200' is not adequate.

Response #10: *During discussion in the meeting on April 5, it was clear that the number of proposed monitoring wells was not reviewed in the context of the plan to delineate via VAP sampling and install monitoring wells based on the results. The final placement of the proposed monitoring wells will be determined based on the results of an adaptive characterization completed using VAP borings and groundwater sampling. Based on the results of the VAP survey, the monitoring wells will be placed along the northern LTP property boundary, and off site, to monitor potential groundwater impacts, as appropriate, based on the revised CSM.*

North of LTP

The proposed approach includes the advancement of VAP and adaptive VAP borings to efficiently delineate and guide in the placement of the permanent wells. The VAP borings and subsequent adaptive borings will be placed 100 to 200 feet apart as described on Figure 4. Once the data are analyzed, the permanent wells will be installed as described in the RespAP.

Northeast of LTP

As described on Figure 1, a robust VAP investigation was used to characterize, define, and delineate off-site groundwater impacts. Based on that investigation, permanent monitoring wells were installed. The same approach will be implemented by conducting a VAP and adaptive boring advancement to determine the placement of the permanent monitoring wells. The boring and adaptive borings are placed from 100 to 200 feet apart as described on Figure 5. Once the data are analyzed, the permanent well will be installed during the same mobilization and additional details are described in the RespAP. These additional wells will reduce the wide spacing of the initially proposed wells and provide greater coverage for monitoring.

Comment #10 continues

- **Utility Corridors:** Experience has shown the fill soil around utility corridors can become a preferential pathway. Adaptive borings and investigation should take place around known utility corridors - all corridors, not only sewer. This investigation is required under Paragraphs 6.6(a)(ii)(A) and 6.7(a)(v) of the CD.

Response #10: Preferential pathways around utility corridors is more common in low-permeability settings (i.e., clay-dominant), where the contrast in permeability between the fill material and native formation is very high. For example, a storm sewer with sandy bedding excavated into a lacustrine clay would provide a potential conduit for preferred migration along the utility corridor pathway. Based on the site CSM (moderately high permeability sand to 15 to 20 feet below grade), it is unlikely that the contrast in permeability would be sufficient at LTP for utilities to act as a conduit for preferred migration of groundwater. As a result, the utility assessment has, and will focus on, evaluating potential impacts to utilities in areas where impacts have been identified. The focused approach will determine what corridors might be in contact with impacted water. The proposed approach will include the following:

- Additional closed-circuit television (CCTV) survey work and a survey of manhole structures will be completed for the remainder of the on-site eastern storm sewer system where COC impacts have been identified. The CCTV will be used to determine if additional pipe rehabilitation is warranted, and the manhole survey will determine which structures (manhole and inverts) are below the water table.
- Sediment samples will be collected from the eastern and western diversion chambers to determine if COCs are present.
- Storm and sanitary sewer systems, both on site and off site, will be systematically evaluated in relation to potential contact with groundwater. The evaluation will include a field survey to confirm locations; survey of inverts and sumps; and if necessary third-party locates of storm sewer, sanitary sewer, potential water lines, and gas lines. The evaluation will aid in determining additional field activities, if necessary, to understand potential utility corridor pathways. In addition, existing monitoring well locations and screened intervals will be compared to the elevation of adjacent sanitary and storm sewer system pipes and manholes. This review will help determine if the well screens are constructed at similar elevations to allow use of the existing well network in evaluating potential pathways for migration of COCs along the utility corridors.
- Once all data stated above have been evaluated, a sampling program will be implemented to determine if impacts are entering and/or migrating through the utility corridor. Additional investigation will include storm and sanitary sampling and potential VAP borings if necessary. Before implementing this phase of the utility corridor investigation, a meeting with the MDEQ will be requested; no additional RespAPs are planned to be submitted for this scope of work. The adaptive approach will be communicated to the MDEQ as additional data are received.

Comment #11 Paragraph 6.6(b) vs. Section 6.7: The RespAP submission appears to combine requirements from Paragraph 6.6(b) and Section 6.7. A separate RespAP submission is required for each CD requirement, as outlined in the CD.

Response #11: Comment acknowledged. The document will be separated as described above.

Per Paragraph 13.3 of the CD, you are required to correct the deficiencies and provide the revised Submission to the MDEQ for review and approval within thirty (30) days of receipt of this notice of disapproval. Unless otherwise stated in the MDEQ's notice of disapproval, the Defendant shall

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proceed to take the actions and perform the response activities not directly related to the deficient portion of the Submission. Please be advised that stipulated penalties will begin to accrue upon receipt of this notice of disapproval.

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Table 1
Soil Vapor Monitoring Point Helium Tracer Test Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location ID	June 2017		September 2017		November 2017	
	Helium Pre Sample (ppm)	Helium Post Sample (ppm)	Helium Pre Sample (ppm)	Helium Post Sample (ppm)	Helium Pre Sample (ppm)	Helium Post Sample (ppm)
SVMP-1-3.5	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-1-7	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-2-4.5	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-2-8.5	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-3-3.5	50	75	0.0	0.0	0.0	0.0
SVMP-3-7	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-4-3.5	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-5-4.5	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-6-4.5	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-7-3.5	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-8-3.5	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-9-4	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-10-3	0.0	1,475	0.0	0.0	0.0	0.0
SVMP-11-3.5	0.0	0.0	NS	NS	NS	NS
SVMP-12-3.5	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-13-2	250	4,750	0.0	0.0	0.0	0.0
SVMP-14-2	225	0.0	0.0	0.0	0.0	0.0
SVMP-15-2	2,450	3,800	0.0	0.0	0.0	0.0
SVMP-16-2	450	1,725	0.0	0.0	0.0	0.0
SVMP-17-2	4,675	2,925	0.0	0.0	0.0	NA
SVMP-18-3	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-19-3	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-20-3	0.0	850	0.0	0.0	NS	NS
SVMP-21-2	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-22-3	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-23-3	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-24-4	0.0	0.0	0.0	0.0	800	0.0
SVMP-25-3	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-25-6	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-26-4	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-27-4.5	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-28-3	0.0	0.0	0.0	0.0	0.0	0.0
SVMP-29-3.5	0.0	0.0	NS	NS	NS	NS
SVMP-29-7.5	0.0	0.0	NS	NS	NS	NS
SVMP-30-4	0.0	0.0	NS	NS	NS	NS
SVMP-31-5.5	0.0	0.0	NS	NS	NS	NS
SVMP-32-3	0.0	0.0	NS	NS	NS	NS
SVMP-32-6	0.0	0.0	NS	NS	NS	NS
SVMP-33-4	0.0	0.0	NS	NS	NS	NS
SVMP-34-4	0.0	0.0	NS	NS	NS	NS
SVMP-35-4	0.0	0.0	NS	NS	NS	NS
SVMP-36-4	0.0	0.0	NS	NS	NS	NS
SVMP-37-2.5	0.0	0.0	NS	NS	NS	NS

See Notes on Last Page.

Table 1 - SVMP Helium Tracer Test Results

Table 1
Soil Vapor Monitoring Point Helium Tracer Test Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Notes:

Helium tracer test readings collected using a Helium Leak Detector MGD-2002. Shroud concentrations ranged from 30-40% helium during all sampling events. As discussed in the MDEQ VI Guidance, a tracer gas can be used to verify that soil-gas samples are from the installed point and not from leaks in the sampling train.

No unacceptable helium leak test results were noted during the June, September, or November sampling events. Samples were deemed acceptable, as all exhibited concentrations of helium in purged soil gas less than 10% of the initial shroud concentration of helium, as presented in the MDEQ VI guidance.

SVMP-11 abandoned after the initial sampling event per the adjacent property owners request.

SVMP-29 through SVMP-37 are located on residential properties and therefore only sampled during the initial sampling event.

SVMP-17 and SVMP-20 were not sampled during the November 2017 sampling event due to saturated screens.

Abbreviations:

MDEQ Michigan Department of Environmental Quality
NA Not analyzed
NS Not sampled
ppm parts per million
SVMP Soil Vapor Monitoring Point
VI Vapor intrusion

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Table 2
Soil Vapor Monitoring Point Purged Air Parameter Readings
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location ID	June 2017			September 2017			November 2017		
	CO ₂ (%)	O ₂ (%)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	CH ₄ (%)
SVMP-1-3.5	1.3	19.7	0.0	1.2	19.3	0.0	1.7	21.1	0.0
SVMP-1-7	0.9	19.4	0.0	1.7	19.2	0.0	2.4	20.0	0.0
SVMP-2-4.5	4.8	17.4	0.0	0.9	20.1	0.0	9.3	7.7	0.0
SVMP-2-8.5	6.7	16.3	0.0	1.7	19.3	0.0	10.5	5.4	0.0
SVMP-3-3.5	0.3	20.6	0.0	0.6	20.4	0.0	0.7	21.4	0.0
SVMP-3-7	0.4	21.2	0.0	0.8	19.9	0.0	0.9	21.1	0.0
SVMP-4-3.5	0.6	20.1	0.0	1.0	20.0	0.0	0.8	19.1	0.0
SVMP-5-4.5	0.2	22.0	0.0	0.2	20.7	0.0	0.5	26.9	0.0
SVMP-6-4.5	0.5	20.8	0.0	0.9	20.1	0.0	0.7	21.0	0.0
SVMP-7-3.5	1.2	20.5	0.0	0.0	20.8	0.0	1.3	19.7	0.0
SVMP-8-3.5	2.5	19.8	0.0	1.4	19.6	0.0	8.9	21.6	0.0
SVMP-9-4	0.3	21.2	0.0	0.0	20.8	0.0	0.7	21.6	0.0
SVMP-10-3	0.2	20.1	0.0	0.4	19.9	0.0	0.5	19.5	0.0
SVMP-11-3.5	0.3	21.1	0.0	NS	NS	NS	NS	NS	NS
SVMP-12-3.5	0.2	21.2	0.0	1.2	19.9	0.0	1.0	19.9	0.0
SVMP-13-2	0.6	20.0	0.0	1.2	18.6	0.0	2.6	11.8	0.0
SVMP-14-2	0.9	18.5	0.0	1.5	19.5	0.0	1.4	19.1	0.0
SVMP-15-2	0.8	21.4	0.0	0.7	20.3	0.0	0.1	20.1	0.0
SVMP-16-2	0.9	20.8	0.0	1.2	19.8	0.0	0.3	20.5	0.0
SVMP-17-2	1.3	19.5	0.0	4.9	16.8	0.0	NS	NS	NS
SVMP-18-3	2.6	18.6	0.0	5.2	16.8	0.0	4.3	17.6	0.0
SVMP-19-3	6.4	14.8	0.0	6.4	16.3	0.0	7.0	15.0	0.0
SVMP-20-3	6.3	15.7	0.0	6.0	16.1	0.0	NS	NS	NS
SVMP-21-2	2.5	19.8	0.0	1.8	19.3	0.0	0.8	19.9	0.0
SVMP-22-3	0.9	20.3	0.0	1.8	19.8	0.0	1.3	20.2	0.0
SVMP-23-3	1.4	20.2	0.0	0.1	15.8	0.0	1.1	20.6	0.0
SVMP-24-4	2.8	19.4	0.0	2.5	18.9	0.0	2.6	19.5	0.0
SVMP-25-3	3.2	18.0	0.0	4.0	15.5	0.0	4.0	18.0	0.0
SVMP-25-6	2.4	18.4	0.0	5.4	14.0	0.0	4.6	17.4	0.0
SVMP-26-4	3.8	12.0	0.0	11.4	8.6	0.0	12.0	5.6	0.0
SVMP-27-4.5	3.8	20.3	0.0	1.1	19.2	0.0	1.5	20.4	0.0
SVMP-28-3	1.8	21.0	0.0	3.4	16.7	0.0	2.3	16.2	0.0
SVMP-29-3.5	0.6	20.5	0.0	NS	NS	NS	NS	NS	NS
SVMP-29-7.5	0.9	20.8	0.0	NS	NS	NS	NS	NS	NS
SVMP-30-4	1.2	19.7	0.0	NS	NS	NS	NS	NS	NS
SVMP-31-5.5	0.9	20.9	0.0	NS	NS	NS	NS	NS	NS
SVMP-32-3	1.6	19.5	0.0	NS	NS	NS	NS	NS	NS
SVMP-32-6	1.3	19.7	0.0	NS	NS	NS	NS	NS	NS
SVMP-33-4	5.7	16.9	0.0	NS	NS	NS	NS	NS	NS
SVMP-34-4	0.9	20.3	0.0	NS	NS	NS	NS	NS	NS
SVMP-35-4	1.1	21.4	0.0	NS	NS	NS	NS	NS	NS
SVMP-36-4	1.4	19.5	0.0	NS	NS	NS	NS	NS	NS
SVMP-37-2.5	7.2	15.8	0.0	NS	NS	NS	NS	NS	NS

See Notes on Last Page.

Table 2 - SVMP Purged Air Parameter Readings

Table 2
Soil Vapor Monitoring Point Purged Air Parameter Readings
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan



Notes:

Air parameter readings collected directly after each round of sample collection using a GEM 2000. SVMP-11 abandoned after the initial sampling event per the adjacent property owners request. SVMP-29 through SVMP-37 are located on residential properties and therefore only sampled during the initial sampling event. SVMP-17 and SVMP-20 were not sampled during the November 2017 sampling event due to saturated screens.

Abbreviations:

- % Percent
- CH₄ Methane
- CO₂ Carbon dioxide
- NS Not sampled
- O₂ Oxygen
- SVMP Soil Vapor Monitoring Point

Table 3
On-Site Purged Air Parameter Readings
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location ID	Date	CH ₄ (%)	O ₂ (%)	CO ₂ (%)
SSMP-10R-01	11/16/2015*	0.2	20.4	0.0
	12/7/2015	0.0	21.4	0.5
SSMP-10R-02	11/16/2015	0.0	12.8	0.3
	11/16/2015*	20.3	8.1	0.0
SSMP-10R-03	12/7/2015	1.6	20.6	0.1
	11/16/2015*	3.5	4.0	0.5
SSMP-10R-04	12/7/2015	0.7	19.7	0.5
	11/16/2015*	11.1	5.8	5.9
SSMP-6R-01	12/7/2015	3.7	16.5	2.4
	11/16/2015*	2.1	17.9	2.9
SSMP-9FM-01	12/7/2015	3.5	18.3	2.7
	11/16/2015*	0.0	18.7	1.0
SSMP-9FM-02	12/7/2015	0.0	21.3	0.5
	11/16/2015*	1.6	12.5	0.8
SSMP-9FM-03	12/7/2015	5.0	3.2	2.0
	11/16/2015*	2.9	16.5	0.1
SSMP-9FM-04	12/7/2015	8.8	10.1	0.1
	11/16/2015*	3.9	18.7	1.1
SSMP-9FM-05	12/7/2015	1.3	21.2	0.3
	1/3/2017	0.0	16.1	1.4
A16-17	12/29/2016	3.5	0.8	5.6
A24-16	8/23/2016	13.7	2.9	0.0
AB94-16	8/24/2016	18.4	5.3	0.0
AB95-16	8/23/2016	1.3	1.6	0.0
AB102-16	12/26/2016*	1.4	3.5	0.1
	8/23/2016	0.0	14.6	1.2
A108-16	12/26/2016*	0.0	14.2	1.9
	6/7/2016	0.0	17.7	1.7
ATO-16-1	1/3/2017*	0.0	15.8	4.2
	6/7/2016	0.0	9.8	5.3
ATO-16-2	1/3/2017*	0.0	5.8	9.0

See Notes on Last Page.

Table 3
On-Site Purged Air Parameter Readings
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location ID	Date	CH ₄ (%)	O ₂ (%)	CO ₂ (%)
ATO-16-3	6/7/2016	0.0	7.1	11.3
	1/3/2017*	0.0	4.4	12.9
ATO-16-4	6/8/2016	0.1	9.0	4.4
	1/3/2017*	0.0	9.6	6.6
B34-16	8/26/2016	1.9	2.7	1.9
B42-16	8/26/2016	0.0	4.7	2.2
	12/26/2016*	0.0	20.3	0.3
B50-16	6/8/2016	5.5	0.0	12.2
B56-16	6/8/2016	10.7	0.0	13.8
B64-16	6/8/2016	12.9	0.0	4.4
B72-16	8/23/2016	0.0	12.0	0.1
	12/26/2016*	0.0	13.0	2.2
B80-16	8/23/2016	0.0	11.8	0.1
	12/26/2016*	0.0	17.6	1.1
B86-16	8/23/2016	0.0	8.1	0.0
	12/26/2016*	0.0	9.1	2.3
C6-16	8/26/2016	0.0	13.0	1.3
	12/26/2016*	0.0	2.9	5.7
C12-16	8/26/2016	12.1	2.5	9.1
C20-16	8/26/2016	20.9	1.7	2.1
C26-16	8/26/2016	4.7	1.2	6.6
D72-16	6/8/2016	0.6	0.0	11.8
	12/26/2016*	0.0	4.6	2.6
D80-16	8/24/2016	3.8	4.7	1.7
D88-16	8/24/2016	3.3	5.0	0.1
D96-16	8/24/2016	8.1	4.4	0.0
D102-16	8/24/2016	0.0	5.1	0.0
	12/26/2016*	0.0	4.9	0.2

See Notes on Last Page.

Table 3
On-Site Purged Air Parameter Readings
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location ID	Date	CH ₄ (%)	O ₂ (%)	CO ₂ (%)
D110-16	8/24/2016	0.0	5.2	0.2
	12/26/2016*	0.0	2.0	1.2
E6-16	8/31/2016	0.1	11.0	1.1
	12/26/2016*	0.4	3.8	7.3
E12-16	8/31/2016	24.9	2.0	7.0
E20-16	8/31/2016	20.4	6.6	0.5
E28-16	8/26/2016	0.2	2.4	6.0
	12/26/2016*	0.0	1.8	2.3
E34-16	8/30/2016	0.0	2.1	1.8
	12/26/2016*	0.0	4.7	0.3
E42-16	8/30/2016	0.0	3.6	6.6
	12/26/2016*	0.0	18.9	3.6
E50-16	6/8/2016	2.4	0.0	13.2
E58-16	6/8/2016	15.9	0.0	12.4
E64-16	6/8/2016	0.0	1.1	11.7
	12/26/2016*	0.0	13.6	0.9
F102-16	8/24/2016	28.6	4.5	0.1
F110-16	8/24/2016	4.1	4.1	0.0
G42-16	8/30/2016	0.5	1.9	11.9
	12/26/2016*	0.0	19.3	3.8
G50-16	6/8/2016	0.3	2.6	6.4
	12/26/2016*	0.0	0.9	1.6
G60-16	6/8/2016	21.4	0.4	5.7
G64-16	6/8/2016	4.5	0.2	6.3
G72-16	6/8/2016	0.0	2.3	12.8
	12/26/2016*	0.0	6.5	0.5
G80-16	8/25/2016	26.4	3.5	8.7
G88-16	8/25/2016	0.0	5.3	0.8
	12/26/2016*	0.0	14.6	1.6

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Table 3 - On-Site Purged Air Parameter Readings

Table 3
On-Site Purged Air Parameter Readings
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location ID	Date	CH ₄ (%)	O ₂ (%)	CO ₂ (%)
G94-16	8/25/2016	45.3	3.3	8.9
H6-16	8/31/2016	0.2	7.0	4.8
	12/26/2016*	0.0	5.4	3.0
H12-16	8/31/2016	35.7	1.7	5.1
H20-16	8/31/2016	32.7	1.8	1.0
H28-16	8/26/2016	6.6	1.1	0.8
	8/30/2016	0.0	1.5	3.1
H36-16	12/26/2016*	0.0	6.8	4.2
	12/29/2016	1.7	0.0	1.4
J80-16	8/25/2016	14.8	5.4	0.0
J96-16	8/25/2016	28.4	1.2	0.0
J102-16	8/25/2016	13.6	3.1	0.0
J110-16	12/29/2016	1.2	0.8	0.0
K8-16	8/31/2016	2.9	3.5	0.8
K12-16	8/31/2016	45.2	3.2	0.9
K20-16	8/31/2016	45.7	2.6	0.1
K28-16	8/26/2016	0.1	2.1	6.6
	12/26/2016*	0.0	1.7	3.6
K36-16	8/26/2016	1.7	1.2	2.6
K42-16	6/7/2016	0.3	0.3	11.3
	12/26/2016*	0.6	1.5	9.5
K50-16	6/7/2016	0.0	1.4	4.1
	12/26/2016*	0.0	2.3	6.6
K58-16	6/7/2016	11.8	0.4	2.3
K64-16	6/7/2016	0.2	0.4	8.2
	12/26/2016*	0.6	2.2	6.9
L74-16	12/29/2016	0.0	0.4	0.0

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Table 3
On-Site Purged Air Parameter Readings
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location ID	Date	CH ₄ (%)	O ₂ (%)	CO ₂ (%)
L104-16	8/25/2016	5.5	2.0	0.0
M42-17	4/11/2017	0.0	19.0	0.6
M58-16	6/7/2016	0.0	0.8	4.2
	12/26/2016*	0.0	4.0	4.8
M80-16	8/25/2016	5.4	1.6	0.0
M88-16	8/25/2016	0.8	4.9	0.0
	12/26/2016*	0.8	2.0	0.0
M96-16	8/25/2016	6.3	2.2	0.0
M110-16	12/29/2016	0.0	6.3	0.0
N6-17	1/3/2017	0.0	19.0	1.4
N14-16	8/30/2016	7.1	1.2	0.1
N20-16	8/30/2016	1.0	1.4	0.0
	12/26/2016*	0.0	1.8	2.6
N28-16	8/30/2016	1.3	1.2	0.0
	12/26/2016*	0.0	2.5	1.9
N36-17	1/3/2017	0.0	1.6	0.0
N52-17	4/11/2017	0.0	10.6	1.9
OB52-16	12/29/2016	6.1	3.4	6.3
OC64-16	6/8/2016	0.0	15.9	3.1
OC70-16	12/29/2016	0.0	13.3	0.9
OD80-16	8/24/2016	0.3	3.3	7.6
OD86-16	8/23/2016	0.5	1.4	9.4
	12/26/2016*	0.0	3.3	2.2
OD94-16	8/23/2016	13.8	1.5	0.5
OD102-16	8/23/2016	0.0	4.7	9.5
	12/26/2016*	0.0	8.0	1.4
OG78-16	8/24/2016	0.0	5.7	0.3
	12/26/2016*	0.0	5.5	7.1

See Notes on Last Page.

Table 3 - On-Site Purged Air Parameter Readings

Table 3
On-Site Purged Air Parameter Readings
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location ID	Date	CH ₄ (%)	O ₂ (%)	CO ₂ (%)
OG86-16	8/25/2016	0.0	5.8	1.9
	12/26/2016*	0.0	7.9	4.8
P68-17	4/11/2017	0.0	18.3	0.5
	12/26/2016*	6.4	1.7	0.0
P80-16	12/27/2016	6.7	1.3	0.1
	8/31/2016	20.3	1.9	0.0
P96-16	8/31/2016	5.6	8.2	0.0
	12/26/2016*	4.4	4.3	0.4
P102-16	12/27/2016	5.5	1.0	0.3
	12/29/2016	0.0	20.5	0.2
PH01-16				
Q12-17	1/3/2017	0.0	7.3	2.1
Q22-17	1/3/2017	0.6	0.9	0.1
Q32-17	1/3/2017	0.0	4.1	0.0
R16-17	1/3/2017	0.0	8.1	5.1
R38-17	4/11/2017	0.0	18.9	0.1
R52-17	4/11/2017	0.0	21.1	0.1
S24-17	1/3/2017	0.0	20.0	0.1
	12/26/2016*	0.7	4.6	0.0
S80-16	12/27/2016	0.9	0.9	0.1
	12/26/2016*	10.6	2.0	0.0
S88-16	12/27/2016	8.1	1.4	0.0
	8/31/2016	19.8	2.9	0.0
S102-16	12/26/2016*	1.0	1.0	0.0
	12/27/2016	0.4	5.3	0.0
S110-16	12/26/2016*	0.0	5.6	1.5
	12/27/2016	0.0	6.0	4.2
T72-17	4/11/2017	0.0	1.8	0.0

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Table 3
On-Site Purged Air Parameter Readings
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location ID	Date	CH ₄ (%)	O ₂ (%)	CO ₂ (%)
U88-16	12/26/2016*	5.0	0.6	0.0
	12/27/2016	5.1	1.6	0.0
	1/12/2017*	5.4	0.0	0.1
U96-16	12/26/2016*	9.6	0.5	0.0
	12/29/2016	9.1	1.8	0.1
	1/12/2017*	9.0	0.0	0.0
U102-16	12/26/2016*	5.8	1.6	0.0
	12/27/2016	5.5	1.1	0.0
	1/12/2017*	3.7	0.0	0.9
X88-16	12/26/2016*	0.3	1.0	0.4
	12/27/2016	0.0	3.7	2.0
	1/12/2017*	0.0	2.4	4.3
X96-16	12/26/2016*	36.1	3.9	0.0
	12/27/2016	43.0	1.2	0.6
	1/12/2017*	42.3	0.1	0.0
X102-16	12/26/2016*	10.9	0.7	0.0
	12/27/2016	10.3	1.1	0.1
	1/12/2017*	12.1	0.0	0.0

Notes:

Air parameter readings collected using a GEM 2000.

* Air monitoring readings collected without sample collection. Initial CH₄% shown.

Abbreviations:

- % Percent
- CH₄ Methane
- CO₂ Carbon Dioxide
- O₂ Oxygen
- SSMP Sub-slab monitoring point