HEALTH CONSULTATION

Evaluation of Trichloroethylene in Ambient Air

DIAMOND CHROME PLATING SITE

HOWELL, LIVINGSTON COUNTY, MICHIGAN

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Michigan Department of Health and Human Services

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Acronyms and Abbreviations

µg/m^3	Micrograms per cubic meter
ATSDR	Agency for Toxic Substances and Disease Registry
CRE	Cancer Risk Estimate
DCP	Diamond Chrome Plating
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EPA	U.S. Environmental Protection Agency
HQ	Hazard Quotient
LCHD	Livingston County Health Department
LOAEL	Lowest Observed Adverse Effect Level
MDEQ	Michigan Department of Environmental Quality
MDHHS	Michigan Department of Health and Human Services
MRL	Minimal Risk Level
PCE	Tetrachloroethylene
RfC	Reference Concentration
RIASL	Recommended Interim Action Screening Level
TCE	Trichloroethylene
TSRIASL	Time-Sensitive Recommended Interim Action Screening Level
VISL	Vapor Intrusion Screening Level

Summary

Introduction	The Diamond Chrome Plating (DCP) site is located in Howell, Michigan. DCP is a hard chrome plating facility that formerly used trichloroethylene (TCE) as a degreasing agent. The purpose of this health consultation is to evaluate the primary public health concern at the DCP site – offsite exposure to the release of TCE from the facility into the ambient air. The Michigan Department of Health and Human Services (MDHHS) became aware of a potential ambient air issue at the site during an offsite vapor intrusion investigation conducted by the Michigan Department of Environment, Great Lakes, and Energy (EGLE). TCE was detected in ambient air above levels of health concern, which prompted public health action and further investigation. Upon recommendation by MDHHS, the Livingston County Health Department (LCHD) issued a public health order requiring that DCP halt emissions of TCE. Subsequent actions taken by DCP, including replacement of the TCE degreasing agent with a product that does not contain TCE, have led to reductions in ambient air TCE concentrations. TCE was not detected in the most recent ambient air samplings conducted in December 2019 and May 2020. Due to variability in contaminant concentrations and source activity, however, additional data are needed to ensure that TCE concentrations remain below levels of health concern in the community.
Conclusions	MDHHS has reached two conclusions in this health consultation:
Conclusion 1	Breathing TCE in ambient air near the DCP site in the past could harm people's health. This posed a public health hazard.
Basis for Conclusion	TCE was detected in ambient air above levels protective of public health at several locations during several sampling events in the past.
Conclusion 2	Breathing TCE in the ambient air near the DCP site is currently not expected to harm people's health because TCE concentrations in the ambient air are below public health protective levels.
Basis for Conclusion	Ambient air data collected after the public health order was issued have shown a decreasing trend in TCE concentrations. TCE was not detected in the most recent ambient air samplings conducted on 12/05/2019, 12/06/2019, and 05/28/2020.
Next Steps	MDHHS recommends that additional rounds of ambient air sampling be conducted to ensure that TCE levels remain low. MDHHS is currently developing a sampling plan for this work.

Purpose and Health Issues

The purpose of this health consultation is to document the MDHHS public health evaluation of TCE contamination in ambient air near the DCP site. This document focuses on the timeframe leading up to and following the 11/18/2019 public health order issued to DCP by the LCHD, which required that DCP halt emissions of TCE. This document is intended to serve as a reference for partner agencies and the public.

There is a long history of environmental investigation and EGLE enforcement action at the DCP site; however, investigations other than the ambient air investigation lie outside the scope of the current health consultation. EGLE and/or DCP have engaged in past and ongoing investigations of groundwater, soil, soil gas, and indoor air both on and offsite. Those investigations have been focused on identifying the source and extent of any contamination and whether there have been indoor air exposures, but the data is of limited use in evaluating offsite exposure to contamination in the ambient air. Thus, this report relies on ambient air data as the most relevant measure of ambient air exposure levels in the community. Data collected during the offsite vapor intrusion investigation is only discussed as it relates to the ambient air investigation. Data collected from the nearby Snedicor's Cleaners site is also only discussed as it relates to the ambient air investigation at the DCP site.

Background

DCP is a hard chrome plating facility located in Howell, Michigan, in a populated mixed-use area. The site is bordered by railroad tracks to the south with residential, commercial, and industrial properties beyond; a baseball diamond to the west with residential properties beyond; and by residential properties to the north and east. The closest homes are less than 100 feet to the north and east of the facility (Figure 1, Figure 2).

Figure 1. Diamond Chrome Plating facility and approximate area of ambient air investigation at the Diamond Chrome Plating site in Howell, Michigan.

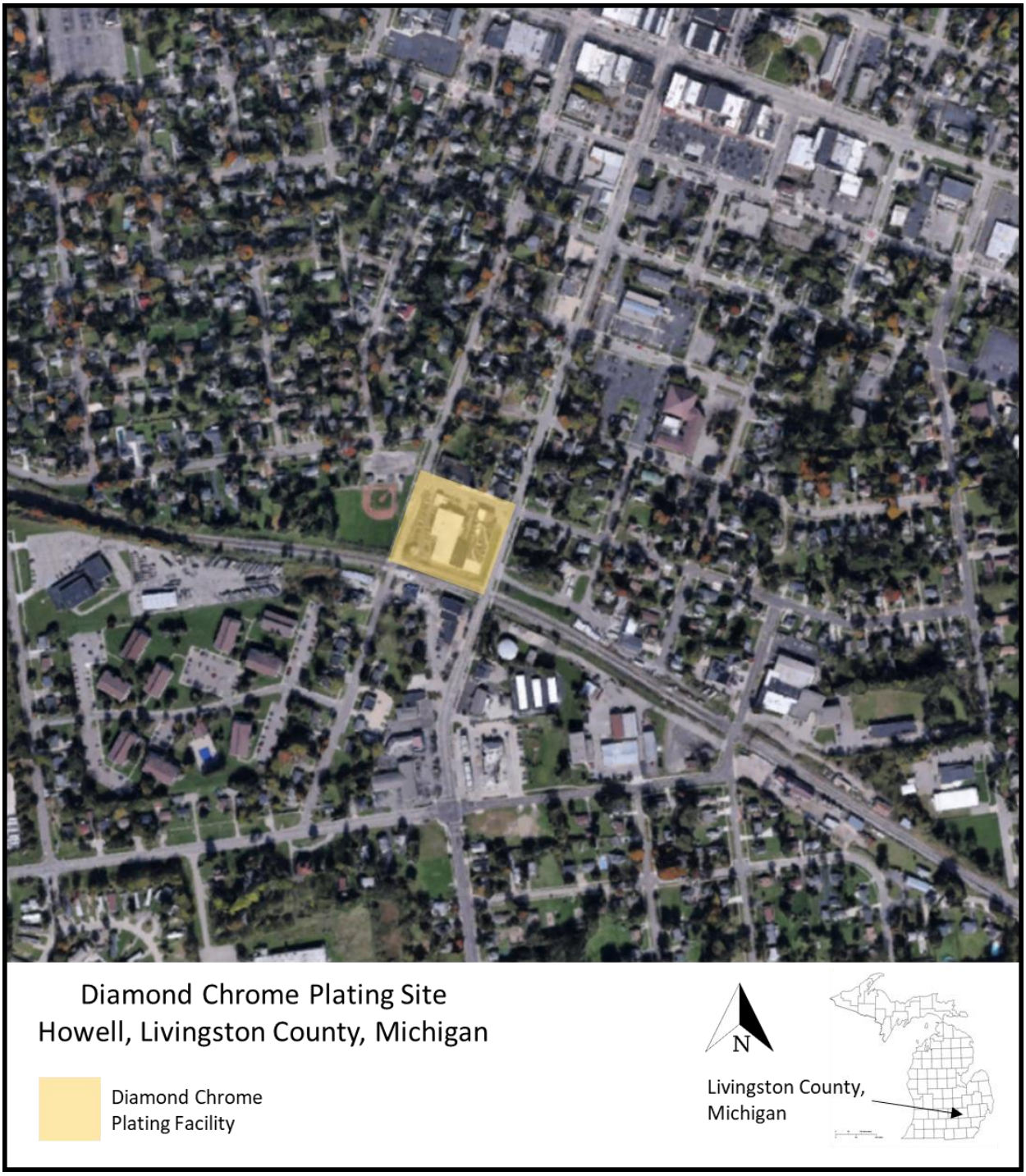
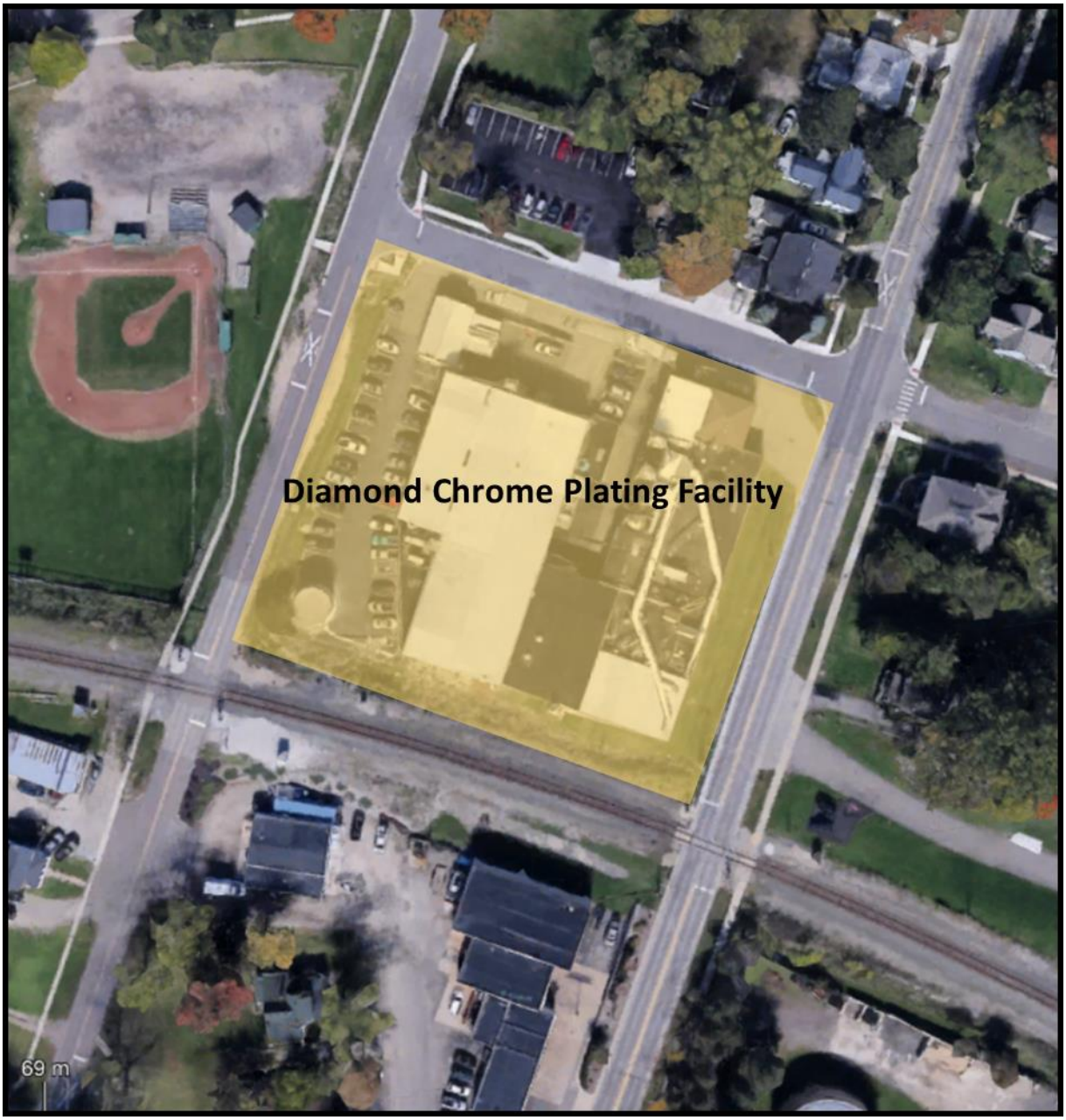


Figure 2. Diamond Chrome Plating Facility in Howell, Michigan.



DCP formerly used TCE as a degreasing agent, which has resulted in environmental contamination. EGLE and DCP have conducted ongoing environmental investigations related to the DCP site, including investigation of groundwater and soil gas contamination.

Based on groundwater and soil gas data collected by DCP, EGLE identified offsite residences that required further investigation of the potential for vapor intrusion. Such investigations often require collection of ambient air samples in conjunction with indoor air and subslab samples to help identify whether the contamination originates from below the ground, inside the home, or outdoors. As part of the vapor intrusion investigation, DCP collected one ambient

air sample from the northeast corner of the DCP property during residential indoor air sampling events on 04/12/2019, 06/04/2019, 08/22/2019, and 09/15/2019. Ambient air TCE levels in the first three sample events exceeded either the residential EGLE/MDHHS Recommended Interim Action Screening Level (RIASL) or Time-Sensitive RIASL (TSRIASL). Elevated levels of TCE had also been detected in the indoor air of some homes; however, subslab soil gas levels beneath the homes were below applicable screening levels. The possibility that ambient air, the sewer system, or other preferential pathways could serve as a source of TCE to the indoor air led EGLE to recommend that DCP perform further investigation of these potential sources.

On 08/07/2019 and 08/08/2019, DCP sampled ambient air and sewer air at several onsite and offsite locations using a portable HAPSITE instrument. The HAPSITE instrument allows for collection, analysis and reporting of results in the field and can detect chemicals at lower levels with more specificity than many other real-time monitors. Elevated levels of TCE were detected near roof vents at the DCP facility, in stormwater and sanitary sewers, and at some offsite outdoor air locations. The HAPSITE data indicated a need for more comprehensive ambient air sampling with samples submitted for laboratory analysis.

On 11/04/2019, EGLE collected 10 ambient air Bottle-Vac grab samples from nine locations (one of the samples was a duplicate sample collected for quality control purposes). The samples were collected north-northeast of the DCP facility, in the general direction of the wind recorded that day at the Livingston County Airport. Samples from three of the locations contained TCE above the residential RIASL. The sample and duplicate sample collected from one of these locations also exceeded the residential TSRIASL for TCE. Exceedances were only detected in the four samples closest to the facility, which were collected between approximately 350 and 1,000 feet from the facility. The six samples collected farther than approximately 1,000 feet from the facility were all non-detect for TCE. The spatial pattern of the data showing decreasing TCE concentrations with distance from the DCP facility, along with previous data showing high concentrations of TCE emitted from DCP roof vents, indicate that DCP was the source of the contamination.

EGLE has conducted an unrelated vapor intrusion investigation at the nearby Snedicor's Cleaners site, 0.2 miles north-northeast of the DCP facility. Tetrachloroethylene (PCE) is the primary contaminant of concern at the site rather than TCE; however, TCE has also been detected in site media. The aforementioned 11/04/2019 ambient air sampling that EGLE conducted for the DCP site investigation included two samples collected near two properties at the Snedicor's Cleaners site which have active vapor intrusion mitigation systems. TCE was not detected in either of the samples. TCE has only been detected at these locations in one of six ambient air sampling events conducted at the Snedicor's Cleaners site between 07/31/2019 and 02/05/2020. The available data do not indicate that emissions from these mitigation systems are a significant source of TCE to ambient air near the Snedicor's Cleaners site or DCP site.

MDHHS and LCHD received the 11/04/2019 data on 11/13/2019. On 11/18/2019, MDHHS sent a letter health consultation to LCHD stating that TCE levels detected in ambient air near the DCP

facility posed an imminent danger to residents. LCHD responded by issuing a public health order later that day (Appendix A). The LCHD order required that DCP:

1) halt emissions of TCE at the facility;
2) demonstrate that TCE levels in ambient air have been reduced and no longer present a public health hazard; and
3) cooperate with LCHD, MDHHS, EGLE, and the U.S. Environmental Protection Agency (EPA) to assess, mitigate, and eliminate the hazard posed by the contamination.

EGLE requested assistance from EPA to perform additional ambient air monitoring in the area. EPA collected several rounds of ambient air data between 11/19/2019 and 11/22/2019. The first round of 24-hour samples, which were deployed on 11/19/2019 and retrieved on 11/20/2019, showed much lower TCE levels in the community immediately following LCHD's public health order. Of the 16 samples collected, there were nine detections of TCE, with a maximum concentration of 1.8 micrograms per cubic meter ($\mu g/m^3$). EGLE Air Quality Division (AQD) collected five samples during the same time period (11/19/2019 – 11/20/2019), and TCE was not detected in any of the samples. In the subsequent EPA samplings, TCE was generally below screening levels or not detected; however, TCE continued to appear in some samples, with a maximum 24-hour average of 3.5 $\mu g/m^3$.

MDHHS, EGLE, LCHD, and EPA held a public meeting on 11/21/2019 to inform the community of the ambient air data and describe actions being taken to address the issue.

On 02/11/2020, MDHHS sent a letter health consultation to LCHD recommending that they continue to keep the current public health order in place until sufficient ambient air data has been collected to provide confidence that ambient air TCE levels have been reduced and will continue to remain below health-protective screening levels.

Discussion

Screening Levels

MDHHS compares the concentrations of chemicals in air to health-based screening levels to evaluate whether the contamination poses a potential public health hazard and whether further investigation or other actions are needed. These screening levels are protective of the most sensitive health effects (i.e., the health effects that occur at lowest exposure levels), whether those be cancer or noncancer effects. Thus, they are also protective of health effects that could occur at higher exposure levels. Screening levels are conservative values set well below levels known to result in adverse health effects. Exposure to levels above the screening level does not necessarily indicate that a person will experience health effects. Rather, it signals a need for further evaluation and potential mitigation of the exposure.

MDHHS compared ambient air data to the EGLE/MDHHS RIASLs and TSRIASLs for residential indoor air exposures (MDEQ, 2017). Although these screening levels were developed to evaluate indoor air exposures, they can also be applied to ambient air exposures assuming

similar exposure conditions. RIASLs are calculated such that they do not exceed a target cancer risk of one excess case in 100,000 people exposed, or a target hazard quotient of one. A cancer risk of one in 100,000 indicates that exposure over a significant portion of a lifetime could be expected to cause one additional case of cancer, beyond the background rate, among 100,000 exposed individuals. A hazard quotient of one or lower indicates that exposure is likely to be without an appreciable risk of noncancer health effects. TSRIASLs are calculated such that they do not exceed a target cancer risk of one in 10,000 or a hazard quotient of three. TSRIASLs represent a greater level of risk and are used to identify conditions that require expedited response actions. If no RIASL or TSRIASL was available for a chemical, MDHHS compared data to the EPA Vapor Intrusion Screening Levels (VISLs) based on a target cancer risk of one in 100,000 and noncancer hazard quotient of one (EPA 2020). As with the RIASLs, VISLs are developed for evaluation of indoor air inhalation exposures but can also be used to evaluate ambient air exposures. They are equal to the EPA Regional Screening Levels (RSLs) for ambient air, based on a target cancer risk of one in 100,000 and noncancer hazard quotient of one.

The data used in this evaluation have all been laboratory analyzed with the exception of the HAPSITE sampling data which were analyzed in the field. Among the laboratory data, the reporting limits for TCE range from 0.16 to 1.6 µg/m^3, depending on the lab where it was analyzed. The reporting limit of 1.6 µg/m^3 is relatively close to the screening level of 2 µg/m^3 used in this evaluation. MDHHS has taken this into consideration when interpreting the data.

Environmental Contamination

MDHHS evaluated ambient air data collected at the DCP site. A summary of the data used in this health consultation is presented in Table 1. Full data sets with comparison to screening levels are located in Appendix B.

Table 1. Sample date, number of ambient air samples, and sample type for ambient air data evaluated in this health consultation.

Sample date[a]	Number of ambient air samples	Ambient air sample type
04/12/2019	1	24-hour sample
06/04/2019	1	24-hour sample
08/07/2019	7	grab samples (HAPSITE)
08/08/2019	9	grab samples (HAPSITE)
08/22/2019	1	24-hour sample
09/15/2019	2	24-hour samples
11/04/2019	10	grab samples (Bottle-Vac)
11/19/2019	21	24-hour samples
11/20/2019	5	grab samples (HAPSITE)
11/20/2019	11	24-hour samples
11/21/2019	6	grab samples (HAPSITE)
11/21/2019	7	24-hour samples
11/22/2019	10	grab samples (HAPSITE)

Sample date[a]	Number of ambient air samples	Ambient air sample type
12/05/2019	5	24-hour samples
12/06/2019	4	24-hour samples
05/28/2020	5	24-hour samples

[a] Sample placement date

Chemicals of Concern

The primary chemical of concern in ambient air at the DCP site is TCE. Several different chemicals were detected in the ambient air, but only TCE exceeded screening levels. Maximum concentrations of all chemicals detected at the DCP site are shown in Table 2.

Table 2. Maximum ambient air concentrations (in micrograms per cubic meter [µg/m^3]), sample date, and sample ID for chemicals detected at the DCP site and analyzed in the laboratory. Data are compared to EGLE/MDHHS residential RIASLs and TSRIASLs and EPA VISLs[1].

Analyte	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)	Maximum concentration (µg/m^3)	Date	Sample ID[d]
1,2,3-Trimethylbenzene	63	190	62.6	1.4	11/04/19	AA-LOT5-110419
1,2,4-Trimethylbenzene	63	190	62.6	6.4	11/04/19	AA-LOT5-110419
1,3,5-Trimethylbenzene	63	190	62.6	1.5	11/04/19	AA-LOT5-110419
2,2,4-Trimethylpentane	NA[e]	NA	NA	51	11/04/19	AA02-110419
2-Butanone (MEK)	NA	NA	5200	240	11/04/19	AA-LOT5-110419
Acetone	31000	31000	32000	8.6	06/04/19	OAQ
Benzene	3.3	19	3.6	1.4	11/04/19	AA07-206SMEAST-110419, AA02-110419
Chloromethane	94	280	94	0.65	11/04/19	AA12-110419, AA-CRANE-110419
Cyclohexane	NA	NA	6300	2.6	11/04/19	AA02-110419
Dichlorodifluoromethane (Freon 12)	NA	NA	100	2.4	06/04/19	OAQ
Ethanol	19000	19000	NA	7.9	08/22/19	OAQ
Ethylbenzene	10	100	11	2.8	11/04/19	AA07-206SMWEST-110419
Hexane	730	2200	730	7.5	11/04/19	AA02-110419
m & p - Xylene	230	690	100	12	11/04/19	AA07-206SMWEST-110419
n-Hexane	730	2200	730	0.82	08/22/19	OAQ
o-Xylene	NA	NA	100	5.3	11/04/19	AA07-206SMWEST-110419
Propylene (Propene)	NA	NA	3100	0.79	08/22/19	OAQ
Styrene	NA	NA	1000	1.1	11/04/19	AA-LOT5-110419
Tetrachloroethylene	41	41	42	4.5	11/04/19	AA-BROOKS110419-DUP
Toluene	5200	7500	5200	7.2	11/04/19	AA02-110419
trans-1,2-	270	790	NA	1.8	11/20/19	TT-DCP-04-112019

Analyte	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)	Maximum concentration (µg/m^3)	Date	Sample ID[d]
Dichloroethylene						
Trichloroethylene	2	6	2.1	22	11/04/19	AA-BROOKS110419
Trichlorofluoromethane (Freon 11)	NA	NA	NA	1.3	06/04/19	OAQ

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

[c]VISL – EPA Vapor Intrusion Screening Level for residential indoor air exposures; the lowest of either the level equal to a Hazard Quotient of one or Cancer Risk of 1 in 100,000.

[d]Sample IDs are arbitrary names selected solely for sampling and labeling purposes.

[e]NA – No screening level has been developed for this chemical.

The data show that only TCE has exceeded screening levels in the ambient air. The maximum laboratory-analyzed detection of 22 µg/m^3 exceeds the TSRIASL of 6 µg/m^3. Other detected chemicals, such as benzene, toluene, and others, may be due to background sources or from contamination introduced during sample collection or analysis. It is common to detect background chemicals in ambient air samples, especially if collected in a populated, urban area such as the DCP site.

For two of the chemicals that were detected in ambient air – 2,2,4-trimethylpentane and trichlorofluoromethane – no RIASL, TSRIASL, or VISL have been developed. 2,2,4-Trimethylpentane was only detected during a single sampling event, and only in one of the ten samples. Trichlorofluoromethane was detected in a single sample during two sampling events. EPA reports that there is no inhalation toxicology information available for either of these chemicals. The sporadic low-level detections are indicative of a transient background source or potential contamination from sampling equipment or the laboratory. 2,2,4-Trimethylpentane is an antiknock gasoline additive that can be found in automobile exhaust. Trichlorofluoromethane, also called freon-11, is a chlorofluorocarbon (CFC) that was formerly used as a refrigerant. Although screening levels are unavailable for these chemicals, they are unlikely to pose a public health hazard due to the low frequency of detections and the limited area where they were detected.

Offsite Ambient Air

MDHHS evaluated ambient air data collected from the community around the DCP facility. Table 3 summarizes the maximum concentrations of TCE that were detected during each sampling event.

Table 3. Ambient air sample date and maximum offsite TCE concentrations (in micrograms per cubic meter [µg/m^3]) detected at the DCP site, compared to the EGLE/MDHHS residential RIASL and TSRIASL[1].

Sample date[a]	Sample type	Maximum offsite TCE concentration (µg/m^3)
RIASL[b] (µg/m^3)		2
TSRIASL[c] (µg/m^3)		6
04/12/2019	24-hour average	3.5
06/04/2019	24-hour average	4.6
08/07/2019	Grab sample	5.045
08/08/2019	Grab sample	27.65
08/22/2019	24-hour average	18
09/15/2019	24-hour average	1.8
11/04/2019	Grab sample	22
11/19/2019	24-hour average	1.8
11/20/2019	Grab sample	8.36
11/20/2019	24-hour average	1.8
11/21/2019	Grab sample	10.43

Sample date[a]	Sample type	Maximum offsite TCE concentration (µg/m^3)
11/21/2019	24-hour average	3.5
11/22/2019	Grab sample	2.14
12/05/2019	24-hour average	<1.4
12/06/2019	24-hour average	<0.16
05/28/2020	24-hour average	<0.16

[1]Shading of sample results indicates exceedance of the respective screening level.
[a]Sample placement date (for 24-hour samples) or sample collection date (for grab samples).
[b]RIASL – Residential EGLE/MDHHS Recommended Interim Action Screening Level
[c]TSRIASL – Residential EGLE/MDHHS Time-Sensitive RIASL

TCE has been consistently detected in all sampling events except for the three most recent samplings on 12/05/2019, 12/06/2019, and 05/28/2020. TCE exceeded screening levels in three of the four 24-hour samplings prior to the 11/18/2019 public health order, and in only one of the six 24-hour samplings after the order was issued. Higher TCE levels have been detected in some of the grab samples. These samples are collected over a brief period and are less representative of average ambient air levels. In general, the data suggest that TCE levels have declined, but that there is some degree of variation within the range of the screening levels.

Onsite Ambient Air

Although the primary focus of this evaluation is offsite exposure to ambient air contamination in the surrounding community, MDHHS also reviewed onsite ambient air data. This data helps identify the source of the TCE and, hence, the most effective target for controlling emissions. MDHHS reviewed onsite data collected on 08/08/2019 via HAPSITE and on 09/15/2019 via a 24-hour SUMMA canister. The data are summarized in the tables below (Table 4, Table 5).

Table 4. Sample ID, sample location, and TCE concentration (in micrograms per cubic meter [µg/m^3]) for ambient air data collected from the DCP facility on 08/08/2019 via HAPSITE[1].

Sample ID[a]	Sample location	TCE (µg/m3)
18	Location/vent # 39 on DCP roof	40.97
19	Location/vent # 69 on DCP roof	1,103.3
20	Central west side of roof up gradient from vents based on wind	3.029
21	Location/vent # 70 on DCP roof	1,267.9

[a]Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 5. Sample ID, sample location, and TCE concentration (in micrograms per cubic meter [µg/m^3]) for ambient air data collected from the DCP facility on 09/15/2019 via SUMMA canister[1]. This sample was collected during a time when the vapor degreaser was shut down and not operating.

Sample ID[a]	Sample location	TCE (µg/m3)
OAQ-Vent 70	Vent 70 on DCP roof	190

[a]Sample IDs are arbitrary names selected solely for sampling and labeling purposes.

The data demonstrate that ambient air emissions from the DCP facility contained high levels of TCE. All of the samples collected near facility vents exceeded the residential RIASL by a factor of 1.5 to 634. Since substantial dilution would occur as emissions move from the DCP property into the community, these data do not represent offsite ambient air concentrations. They do, however, establish the DCP facility as a past source of TCE.

Exposure Pathways Analysis

To determine whether persons are, have been, or are likely to be exposed to contaminants, MDHHS evaluates the environmental and human components that could lead to human exposure. An exposure pathway contains five elements:

- A source of contamination
- Contaminant transport through an environmental medium
- A point of exposure
- A route of human exposure
- A receptor population

An exposure pathway is considered complete if there is evidence, or a high probability, that all five of these elements are, have been, or will be present at a site. It is considered a potential pathway if there is a low probability that a receptor population would be exposed. A pathway is considered incomplete if there is no evidence that one or more of the elements above are, have been, or will be present. It may be considered unknown if data are unavailable to evaluate the exposure. See Table 6 for an exposure pathway analysis of ambient air contamination at the DCP site.

Table 6. Exposure pathway analysis for inhalation of TCE in ambient air at the Diamond Chrome Plating site

Source	Environmental Medium	Exposure Point	Exposure Route	Exposed Population	Time Frame	Exposure
DCP	Outdoor air	Outdoor air in the community surrounding the DCP facility	Inhalation	Community near the DCP facility	Past	Complete
					Present	Incomplete
					Future	Potential

The available data provide strong support that DCP is the source of the observed ambient air contamination. DCP actively used TCE as a degreasing agent in the past. Samples collected near

roof vents at the facility have shown high levels of TCE released to the ambient air. Detections of TCE in the surrounding community have been highest near the facility, with lower or non-detect concentrations farther from the facility.

Contamination that is released to the air from the DCP facility would tend to distribute throughout the surrounding area, with specific patterns of distribution determined by wind speed, wind direction, and other environmental factors. As a predominately residential area, community members would be expected to have relatively consistent exposure to outdoor air. Although outdoor air is the primary exposure point considered in this evaluation, there would also be exchange between the outdoor and indoor environments, potentially resulting in indoor air contaminant concentrations that are similar to those in the outdoor air. Assuming that there are no additional indoor sources of TCE, indoor air concentrations would not be expected to be higher than outdoor air concentrations. The vapor intrusion investigation did not identify significant subsurface contamination beneath homes that would serve as a source of TCE to the indoor air, and there have been no indoor air detections of TCE that exceed the maximum concentration detected in outdoor air[1] (See Tables 20 and 21). Thus, the assumption of an outdoor air exposure point and the evaluation of ambient air data constitute a protective method of evaluating site-related inhalation exposure.

The exposure route most relevant to TCE contamination in the ambient air is inhalation since TCE can be absorbed into the body through the lungs. TCE is not easily taken up from the air through the skin. TCE in the ambient air would also not be expected to accumulate in foods, such as homegrown vegetables, nor pose a hazard to people eating these foods (ATSDR, 2017; MDH, 2012). Thus, dermal and indirect oral exposure to TCE in the ambient air at the DCP site is not expected to contribute significantly to total exposure.

A completed exposure pathway was present in the past since all exposure pathway elements were present and TCE was detected above health-protective levels in the outdoor air. Ambient air data are only available for the recent past. Since DCP has operated at this location for decades and has been using TCE for all or part of that time, a completed exposure pathway was likely present in the more distant past as well.

The exposure pathway for TCE in the ambient air is currently considered to be incomplete. The most recent ambient air data collected on 12/05/2019, 12/06/2019, and 05/28/2020 show that TCE was not detected at any of the sample locations. This may indicate that the source at the DCP facility is no longer present. Although the possibility for exposure at this time seems unlikely, there is some uncertainty in this determination given the limitations of the data. The ambient air data were collected over a relatively brief 24-hour sampling period, and TCE concentrations can vary depending on weather conditions and source activity. Hence, there is

[1] Subslab soil gas and indoor air sampling has been conducted at multiple homes near the DCP site on several occasions between March 2019 and August 2020. TCE has not been detected above the residential RIASL in the subslab of homes. TCE has been detected in indoor air above the residential RIASL, but not above the maximum concentration found in outdoor air to date. For further information about the MDHHS evaluation of vapor intrusion at the DCP site, please contact the MDHHS Division of Environmental Health at 1-800-648-6942.

some uncertainty as to whether the exposure pathway continues to be incomplete at the time of this evaluation. See the Limitations, Recommendations, and Public Health Action Plan sections for further discussion of these uncertainties and actions being taken to address them.

The exposure pathway for TCE in the ambient air could be potentially complete in the future, although it is likely to remain incomplete. Assuming the most recent ambient air data are representative of ongoing conditions, and that no new sources of TCE are introduced (or previous sources reintroduced), the exposure pathway would remain incomplete; however, MDHHS is unable to predict whether sources of TCE may be introduced at the site in the future. MDHHS has coordinated with LCHD to take actions that would prevent this from happening, however. The public health order issued by LCHD, which requires that DCP halt emissions of TCE, will remain in place until MDHHS and LCHD can gain greater confidence that TCE in the ambient air will not pose a public health hazard again.

Toxicological Evaluation

Trichloroethylene

TCE, also known as trichloroethylene or trichloroethene, is a chlorinated volatile organic compound that has many industrial applications. It is used as a metal degreaser, a solvent, an ingredient in the manufacture of other chemicals, and formerly, as an anesthetic. TCE can also be found in some household products, such as adhesives, lubricants, and paint strippers. Liquid TCE that is in contact with the atmosphere tends to volatilize rapidly into the air and break down relatively quickly. TCE is mobile in soil and can percolate downwards into subsurface soil and groundwater. Breakdown of TCE occurs slowly in soil and groundwater. As a result, subsurface contamination can serve as an ongoing source of contamination as chemical vapors rise through soil air spaces, potentially entering overlying structures. Exposure to TCE most often occurs through vapor intrusion into indoor air and through drinking water. People can also be exposed to TCE if they use it in the workplace or if they live near a facility that emits TCE into the air (ATSDR 2019).

TCE is not stored in the body for long periods. When TCE is breathed in, some of it will be breathed out and some of it will move from the lungs into the blood. Once in the blood, TCE is distributed to other parts of the body where most of it is broken down into other chemicals. This mainly occurs in the liver. Most of the TCE that is broken down will leave the body in the urine within about a day. Because TCE is lipophilic, it can build up in body fat if it enters the body faster than it can be eliminated. Once exposure stops, however, TCE will quickly leave the fat (ATSDR 2019).

The primary target of TCE is the central nervous system, although it can affect other body systems as well. Much of what we know about exposure to low levels of TCE comes from laboratory animal studies. In rodents, TCE has been shown to cause fetal heart malformations (Makris et al. 2016) and decreased thymus weight. At higher levels, such as those encountered in an occupational setting, TCE may cause impaired liver function, immunological effects, dermal effects, cardiovascular disease, and decreased reproductive health. Human

epidemiological data provides strong support for an association between TCE and kidney cancer. There is also some evidence of an association with non-Hodgkin's lymphoma and liver cancer (ATSDR 2019).

The MDHHS/EGLE RIASL of 2 µg/m^3 for TCE is based on the EPA Reference Concentration (RfC) for chronic inhalation exposure to TCE (MDEQ, 2017). The RfC, in turn, is based on two laboratory animal studies involving exposure to TCE through drinking water (EPA 2011). One of the studies found decreased thymus weight (an indication of immunotoxicity) in mice exposed to TCE for 30 weeks (Keil et al., 2009). The other study found cardiac malformations in rat fetuses whose mothers drank TCE-contaminated water during the 22-day gestation period (Johnson et al. 2003). EPA derived two candidate inhalation RfCs from the ingestion studies using physiologically based pharmacokinetic (PBPK) modeling. The RfC based on decreased thymus weight was calculated using a combined uncertainty factor of 100 for use of a lowest observed adverse effect level (LOAEL) (10), animal-to-human extrapolation (3.16), and human variability (3.16). The RfC based on fetal cardiac malformations was calculated using a combined uncertainty factor of 10 for animal-to-human extrapolation (3.16) and human variability (3.16). The two RfCs were averaged and rounded to one significant digit to yield the final RfC of 2 µg/m^3. MDHHS and EGLE adopted this value as the residential RIASL. The TSRIASL was calculated by multiplying the RIASL by three to represent a hazard quotient of three. Note that although the RIASL is equal to a chronic RfC, exposure of pregnant mothers to TCE during a potentially brief period of fetal development could pose a risk to the fetus. The potential for developmental effects over shorter exposure periods is reflected in the Agency for Toxic Substances and Disease Registry's (ATSDR's) adoption of this same value of 2 µg/m^3 as the intermediate Minimal Risk Level (MRL) for TCE exposures lasting two weeks to a year.

MDHHS and EGLE also considered cancer risk in selection of the RIASL for TCE. EPA has established an inhalation unit risk (IUR) estimate of 4.1 x 10^{-6} per µg/m^3 for continuous lifetime exposure to TCE (EPA 2011). This value is based on the risk of kidney cancer with a factor applied to account for risk of liver cancer and non-Hodgkin's lymphoma. The candidate screening level calculated using this IUR and a target cancer risk of one in 100,000 is higher than the screening level based on noncancer risk. Thus, the final RIASL of 2 µg/m^3 is protective of both noncancer and cancer risk.

Risk Evaluation

MDHHS calculated hazard quotients (HQs) and cancer risk estimates (CREs) to evaluate the health risk posed by ambient air contamination. HQs are used to evaluate noncancer exposures. They can be calculated by dividing an exposure level by the chemical's health-based screening level. If the result is less than one, the chemical is not expected to pose an appreciable noncancer health hazard. The level of concern increases as the HQ exceeds one. A CRE is an upper-bound estimate of the probability that a person may develop cancer sometime in their lifetime due to long-term exposure to a given level of contamination. MDHHS uses an acceptable standard of no more than one excess case of cancer among 100,000 exposed individuals for evaluating cancer risk. This risk level lies within EPA's maximum generally acceptable cancer risk range of one in 1,000,000 to one in 10,000. The CRE for TCE exposure

was calculated using the EPA IUR of 4.1 x 10^{-6} per µg/m^3 and reasonable worst-case exposure assumptions. The CRE calculation assumes that people have been exposed to a specific level of TCE 24 hours per day, 350 days per year, for 26 years out of a 70-year lifetime.

For both a past and current exposure scenario, MDHHS selected a single ambient air TCE exposure level from the available data to represent exposures during that timeframe. Using results from a single sampling event to evaluate the risk posed by TCE carries some important limitations. The data represent ambient air TCE levels at a specific point in time; however, TCE levels may vary significantly over time. With regard to past exposures, ambient air data from the surrounding community are only available for the recent past, and not for the decades-long period that DCP has operated at the site. The purpose of this risk evaluation is to obtain a conservative estimate of health risk to aid in public health evaluation and decision making. It should not be interpreted as a statement of the level of risk that any particular community member has experienced currently or in the past. Such a determination would require comprehensive ambient air monitoring data from the preceding decades along with detailed information about an individual's exposure to ambient air. This risk evaluation considers a hypothetical scenario in which people are consistently exposed to a specific concentration of TCE in ambient air over an extended period of time.

Risk evaluation - Past

MDHHS selected ambient air data collected on 11/04/2019 to represent conditions in the surrounding community during past operations at the DCP facility. These samples were collected via Bottle-Vac over an 8 to 15-minute sample period. Although the brief sample period introduces uncertainty into risk calculations which extrapolate a given exposure level over a long period, the data were identified as being most appropriate since they are the only laboratory-analyzed ambient air data collected over a wider area of the community prior to the 11/18/2019 public health order.

An HQ and CRE were calculated for the maximum TCE concentration of 22 µg/m^3 detected during the 11/04/2019 sampling (Table 7). The HQ and CRE represent the maximum estimated noncancer hazard and cancer risk posed by the contamination in the area of the community with highest detected levels. They do not represent the general risk for the whole community.

Table 7. Exposure point concentration type, exposure point concentration value (in micrograms per cubic meter [µg/m^3]), hazard quotient, and cancer risk estimate for exposure to the maximum detected level of TCE in laboratory-analyzed ambient air samples collected on 11/04/2019.

	Exposure Point Concentration - Type	Exposure Point Concentration – Value (µg/$m^{3)}$	Hazard Quotient	Cancer Risk Estimate
TCE	Maximum	22 µg/m^3	11	4.6 x 10^{-5}

The calculated hazard quotient of 11 indicates that people consistently exposed to a level of 22 µg/m^3 in ambient air would experience an elevated exposure. As previously mentioned, the RfC

on which the RIASL for TCE is based is an average of two candidate RfCs for immune effects and developmental effects. Because the HQ of 11 exceeds the combined uncertainty factor of 10 for the developmental effects component of the RfC, it indicates a greater level of concern for this health effect. The HQ of 11 also exceeds the individual uncertainty factors for the immune effects component of the RfC, including an uncertainty factor of 3.16 for human variability. This indicates that there is a greater level of concern that the general population, and not just the most sensitive individuals, could experience immune effects if consistently exposed to a concentration of 22 $\mu g/m^3$.

The theoretical CRE of 4.6 extra cases of cancer out of 100,000 people similarly exposed (4.6×10^{-5}) exceeds the target risk level of 1×10^{-5} indicating that long-term exposure to a concentration of 22 $\mu g/m^3$ would pose an elevated cancer risk for people who are consistently exposed to this level.

Risk Evaluation - Present

The most recent ambient air samples collected on 12/05/2019, 12/06/2019, and 05/28/2020 represent conditions after the public health order was issued and after DCP modified their operations and discontinued use of the TCE degreasing agent. These samples were collected over a 24-hour period from the community around DCP. TCE was not detected in any of the samples. Because TCE did not exceed the RIASL, the data were below the target hazard quotient and cancer risk on which the RIASL is based.

Evaluation of Potential for Chemical Interactions

Because people are exposed to mixtures of chemicals at sites of environmental contamination, rather than to individual chemicals, there is the potential for chemicals to interact and cause health effects that would not be expected from a single-chemical exposure. This interaction can result in an “additive” effect, in which the actions of each chemical are summed; a “synergistic” effect, in which the effect is greater-than-additive; or an “antagonistic” effect, in which the effect is less-than-additive (ATSDR 2018).

Chemicals that cause the same health effects are more likely to interact than chemicals that cause different health effects. ATSDR has developed interaction profiles for several chemical mixtures which evaluate how certain chemicals could interact. Two of the interaction profiles address mixtures that include TCE. These mixtures are:

- 1,1,1-Trichloroethylene, 1,1-dichloroethane, trichloroethylene, and tetrachloroethylene (ATSDR 2004), and
- Chloroform, 1,1-dichloroethylene, trichloroethylene, and vinyl chloride (ATSDR 2007).

Of the chemicals above that ATSDR has specifically identified as having the potential to interact with TCE, only PCE has been detected in ambient air at the DCP site. PCE was detected in four of the ten Bottle-Vac grab samples collected on 11/04/2019 at concentrations ranging from 2.8 to 4.5 $\mu g/m^3$. PCE was analyzed for and not detected in all subsequent 24-hour samples collected on 11/20/2019, 11/21/2019, 11/22/2019, 12/05/2019, 12/06/2019, and 05/28/2020.

PCE was detected in two of the three subsequent HAPSITE grab sampling events on 11/21/2019 and 11/22/2019, at a maximum level of 0.56 µg/m^3.

TCE and PCE both target the nervous system, liver, and kidneys, and can increase the risk of liver and kidney cancer. The available information suggests that these chemicals interact additively, and there is no evidence of greater-than-additive interaction. ATSDR recommends that mixtures of TCE and PCE be evaluated by calculating a hazard index (HI), which is the sum of the individual HQs (ATSDR 2004). This method is based on the assumption of additivity. ATSDR recommends that an HI only be calculated if two or more individual chemicals in a mixture have HQs greater than 0.1. Otherwise, additive or non-additive interactions are unlikely to result in a significant health hazard (ATSDR 2018). The maximum PCE concentration of 4.5 µg/m^3 detected during the 11/04/2019 sampling event slightly exceeds this threshold with an HQ of 0.11, while the maximum TCE detection of 22 µg/m^3 from the same sampling event corresponds to an HQ of 11. These maximum PCE and TCE levels were detected in two separate, co-located grab samples that were collected concurrently on 11/04/2019: "AA-BROOKS110419" contained PCE at 3.1 µg/m^3 and TCE at 22 µg/m^3, while "AA-BROOKS110419-DUP" contained PCE at 4.5 µg/m^3 and TCE at 21 µg/m^3 (See Table 10).

In accordance with ATSDR's recommendation, MDHHS calculated an HI of 11.11 for combined exposure to the maximum levels of PCE and TCE. The HI is not substantially greater than the individual HQ for TCE, and it does not significantly alter conclusions regarding the risk posed by ambient air contamination on the 11/04/2019 sample collection date.

The evaluation of potential chemical interactions indicates that exposure to TCE in combination with other chemicals detected at the DCP site is unlikely to result in non-additive interaction effects. Although PCE may interact with TCE in an additive manner, it has not been consistently detected at the DCP site and has been absent in all laboratory-analyzed samples following the 11/04/2019 sampling. Thus, significant additive interactions between TCE and either PCE or other chemicals are unlikely.

Children's Health Considerations

In general, children may be at greater risk than adults from exposure to hazardous substances at sites of environmental contamination (ATSDR 2019). At sites of ambient air contamination, in particular, certain factors may increase their risk from inhalation exposure. They are shorter than most adults, and therefore breathe vapors found closer to the ground. They also have lower body weights and higher inhalation rates which result in a greater dose of hazardous substance per unit of body weight. The health effects resulting from inhalation exposure may have a greater impact on children. The developing body systems of children can sustain permanent damage if toxic exposures are high enough during critical growth stages. For example, fetal development involves the formation of the body's organs. Injury during these key periods of prenatal growth and development could lead to malformation of organs (teratogenesis), disruption of function, and premature death. Exposure of the mother could lead to exposure of the fetus, via the placenta, or affect the fetus because of injury or illness sustained by the mother. The implication for environmental health is that children may

experience substantially greater exposures to contaminants in air than adults at sites of ambient air contamination, and that they may be more susceptible to adverse effects caused by exposure.

Several of the factors mentioned above apply to children's inhalation exposure and sensitivity to TCE (ATSDR 2019). As with ambient air contaminants in general, children may receive a proportionally larger dose of TCE if exposed to TCE contamination in the air. Nursing infants can also be exposed to TCE via breast milk from mothers who have been exposed. Once TCE has been inhaled and has entered the bloodstream, it can cross the blood-brain barrier, and this transfer might be greater in children than adults. Human epidemiological studies and animal studies indicate that TCE can interfere with developmental processes in the fetus, potentially resulting in congenital heart defects (Makris et al., 2016), spontaneous abortion, or other developmental abnormalities (ATSDR 2019).

Community Health Concerns

The surrounding community has expressed considerable interest in the DCP site. The community has asked health questions and voiced concerns to MDHHS during the 11/21/2019 public meeting and through direct correspondence with MDHHS. MDHHS partnered with EGLE to address all questions asked at the public meeting. Questions and responses have been posted on the EGLE DCP website[2] and are included in Appendix C.

Conclusions

Based on the currently available data, MDHHS reached the following conclusions:

Conclusion 1: Breathing TCE in ambient air near the DCP site in the past could harm people's health. This posed a public health hazard.

Basis for Conclusion: TCE was detected in ambient air above levels protective of public health at several locations during several sampling events in the past.

Conclusion 2: Breathing TCE in the ambient air near the DCP site is currently not expected to harm people's health because TCE concentrations in the ambient air are below levels of health concern.

Basis for Conclusion: Ambient air data collected after the public health order was issued have shown a decreasing trend in TCE concentrations. TCE was not detected in the most recent ambient air samplings.

Limitations

Limitations to the findings of this health consultation include the following:

- We cannot evaluate exposure to TCE in the ambient air prior to 2019 since historic ambient air data are not available.

[2] EGLE Diamond Chrome Plating Website

- The available ambient air data were collected over brief sampling periods (e.g., 24 hours or less), so there is uncertainty in whether the data are representative of average conditions. Ambient air TCE levels can vary based on weather conditions, operations at the DCP facility, and other factors.
- There is a high degree of uncertainty in risk calculations based on the ambient air data, due to uncertainties about the representativeness of the data and the exposure level of residents.
- It is unknown whether additional sources of TCE could be introduced or reintroduced in the future.

Recommendations

MDHHS recommends that additional rounds of ambient air sampling be conducted to ensure that TCE levels remain below health-protective screening levels.

MDHHS recommends that LCHD keep the public health order for the DCP facility in place until a more comprehensive ambient air dataset can be collected to verify that TCE in ambient air does not pose a health hazard to residents.

Public Health Action Plan

MDHHS is currently developing a sampling plan for ambient air sampling at the DCP site.

MDHHS will update LCHD regarding any changes to the current recommendation to keep the public health order in place.

MDHHS will remain available as needed for future consultation at this site.

If any citizen has additional information or health concerns regarding this health consultation, please contact the MDHHS Division of Environmental Health at 1-800-648-6942.

Report Preparation

The Michigan Department of Health and Human Services (MDHHS) prepared this Health Consultation for the Diamond Chrome Plating site located in Howell, Livingston County, Michigan. MDHHS evaluated data of known quality using approved methods, policies, and procedures existing at the date of publication.

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References

Agency for Toxic Substances and Disease Registry (ATSDR). 2004. Interaction profile for: 1,1,1-trichloroethane, 1,1-dichloroethane, trichloroethylene, and tetrachloroethylene. Atlanta, Georgia: US Department of Health and Human Services. Available at: http://www.atsdr.cdc.gov/interactionprofiles/IP-vocs/ip02.pdf.

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Interaction profile for: chloroform, 1,1-dichloroethylene, trichloroethylene, and vinyl chloride. Atlanta, Georgia: US Department of Health and Human Services. Available at: https://www.atsdr.cdc.gov/interactionprofiles/ip-13/ip13.pdf.

Agency for Toxic Substances and Disease Registry (ATSDR). 2017. How can I be exposed to TCE? Atlanta, Georgia: U.S. Department of Health and Human Services. Available at: https://www.atsdr.cdc.gov/tox-tool/trichloroethylene/01/how_can_i_be_exposed.html.

Agency for Toxic Substances and Disease Registry (ATSDR). 2018. Framework for assessing health impacts of multiple chemicals and other stressors. Atlanta, Georgia: U.S. Department of Health and Human Services. Available at: https://www.atsdr.cdc.gov/interactionprofiles/ip-ga/ipga.pdf.

Agency for Toxic Substances and Disease Registry (ATSDR). 2019. Toxicological profile for trichloroethylene. Atlanta, Georgia: U.S. Department of Health and Human Services. Available at: https://www.atsdr.cdc.gov/toxprofiles/tp19.pdf.

Johnson PD, Goldberg SJ, Mays MZ, Dawson BV. 2003. Threshold of trichloroethylene contamination in maternal drinking waters affecting fetal heart development in the rat. Environmental Health Perspective 111(3): 289-292.

Keil DE, Peden-Adams MM, Wallace S, Ruiz P, Gilkeson GS. 2009. Assessment of trichloroethylene (TCE) exposure in murine strains genetically-prone and non-prone to develop autoimmune disease. Journal of Environmental Science and Health Part A. 44(5): 443-453.

Makris SL, Scott CS, Fox J, Knudsen TB, Hotchkiss AK, Arzuaga X, Euling SY, Powers CM, Jinot J, Hogan KA, Abbott BD. 2016. A systematic evaluation of the potential effects of trichloroethylene exposure on cardiac development. Reproductive Toxicology 65 (2016): 321-358.

Michigan Department of Environmental Quality (MDEQ). 2017. Volatilization to Indoor Air Recommendations for Interim Action Screening Levels and Time-Sensitive Interim Action Screening Levels.

Minnesota Department of Health. Trichloroethylene (TCE) and gardening. Available at: https://www.health.state.mn.us/communities/environment/hazardous/docs/tcegarden.pdf.

U.S. Environmental Protection Agency (EPA). 2011. IRIS Toxicological Review of Trichloroethylene (Interagency Science Discussion Draft). Washington, DC, EPA/635/R-09/011D. Available at: https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0199_summary.pdf.

U.S. Environmental Protection Agency (EPA). 2020. Vapor Intrusion Screening Level Calculator. https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-levels-visls (accessed March 26, 2020).

LIVINGSTON COUNTY HEALTH DEPARTMENT IMMINENT DANGER ORDER TO DIAMOND CHROME PLATING, INC.

The Livingston County Health Department ("LCHD") has authority to order the correction of conditions posing an imminent danger to the public health. MCL 333.2451(1)

Diamond Chrome Plating, Inc. ("DCP"), located at 604 S. Michigan Ave., Howell, Michigan 48843, is a chrome plating facility, whose industrial processes produce the release of trichloroethylene (TCE) emissions.

TCE exposure has been found to cause fetal cardiac malformations and decreased thymus weight in animals, and has the potential to cause cardiac defects in humans.

On October 17, 2019, the Michigan Department of Environment, Great Lakes, and Energy ("EGLE") conducted an inspection of DCP to assess DCP's compliance with the requirements of the Clean Air Act. On October 30, 2019, EGLE issued a Violation Notice to Scott Wright of DCP, for DCP's failure to contain in plant emissions of TCE. TCE releases in the soil, groundwater, sewer systems, and ambient air at the site are being investigated. EGLE required DCP to correct the cited violations and submit a written response.

On November 13, 2019, the Michigan Department of Health and Human Services (MDHHS), LCHD, and EGLE received results from ambient air samples collected on November 4, 2019. Some of the November 4th samples showed higher levels of TCE in the ambient air than had previously been detected. Specifically, the sample closest to the facility contained TCE more than ten times the residential health-based screening level. MDHHS concluded that TCE levels measured in the neighborhood adjacent to Diamond Chrome Plating plant poses an Imminent Danger to Health. MDHHS, EGLE, and LCHD also initiated actions to notify the public, and are coordinating with national, state, and local partners to address the issue.

On November 18, 2019, the MDHHS issued a Health Consultation Letter, in which it determined, based upon testing of TCE from passive roof vents, that TCE at documented high levels measured in the neighborhood adjacent to the DCP plant poses an Imminent Danger to Health, such that TCE emissions from DCP must be halted immediately to protect the public from the potential acute health effects of TCE, including but not limited to fetal cardiac malformations.

MCL 333.2451(1) provides that:

> Upon a determination that an imminent danger to the health or lives of individuals exists in the area served by the local health department, the local health officer immediately shall inform the individuals affected by the imminent danger and issue an order which shall be delivered to a person authorized to avoid, correct, or remove the imminent danger or be posted at or near the imminent danger. The order shall incorporate the findings of the local health department and require immediate action necessary to avoid, correct, or remove the imminent danger. The order may specify action to be taken or prohibit the presence of individuals in locations or under conditions where the imminent danger exists, except individuals whose presence is necessary to avoid, correct, or remove the imminent danger.

The conditions and practices outlined above could reasonably be expected to cause death, disease, or serious physical harm immediately or before the imminence of the danger can be eliminated through enforcement procedures otherwise provided.

On these grounds, I reasonably believe the conditions at DCP pose an imminent danger. Now, therefore, it is hereby ordered that DCP immediately avoid, correct, or remove the imminent danger at its facility by:

(1) Halting emissions of TCE at DCP.

(2) Demonstrating that the TCE levels in the ambient air have been reduced to no longer present a public health hazard.

(3) Cooperating with LCHD, MDHHS, EGLE, and the Environmental Protection Agency to assess, mitigate, and eliminate the dangers outlined above.

Failure to comply promptly with this Order may require the LCHD to petition the Circuit Court for an injunction to restrain a condition or practice which causes the imminent danger, or to require action to avoid, correct, or remove the imminent danger. MCL 333.2451(2).

Violation of, or failure to comply with, this Order is a misdemeanor punishable by up to 6 months in jail and a fine of not more than $200, or both. MCL 333.2443.

THIS ORDER IS EFFECTIVE IMMEDIATELY.

Dated: November 18, 2019

Dianne McCormick, Health Officer
Livingston County Health Department

11-18-2019

Appendix B: Screened Data

Table 8. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 04/12/2019, 06/04/2019, 08/22/2019, and 09/15/2019 from the northeast corner of the DCP property, and one sample collected on 09/15/2019 from a vent on the DCP roof[1].

Sample ID	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)	OAQ (µg/m^3)	OAQ (µg/m^3)	OAQ (µg/m^3)	OAQ (µg/m^3)	OAQ- Vent 70 (µg/m^3)
Date				04/12/2019	06/04/2019	08/22/2019	9/15/19*	9/15/19*
1,1,1-Trichloroethane (Methyl Chloroform)	5000	5000	5200	-	ND[d]	ND	-	-
1,1,2 - Trichloroethane	NA[e]	NA	0.21	-	ND	ND	-	-
1,1,2,2-Tetrachloroethane	NA	NA	0.48	-	ND	ND	-	-
1,1-Dichloroethane	16	160	18	-	ND	ND	-	-
1,2,4-Trimethylbenzene	63	190	62.6	-	ND	ND	-	-
1,2-Dichloroethane	NA	NA	1.1	-	ND	ND	-	-
1,3,5-Trimethylbenzene	63	190	62.6	-	ND	ND	-	-
1,3-Butadiene	NA	NA	0.94	-	ND	ND	-	-
2-Butanone (Methyl ethyl ketone, MEK)	NA	NA	5200	-	ND	ND	-	-
2-Propanol (isopropyl alcohol)	NA	NA	210	-	ND	ND	-	-
4-Ethyltoluene	NA	NA	NA	-	ND	ND	-	-
4-Methyl-2-pentanone	NA	NA	3100	-	ND	ND	-	-
Acetone	31000	31000	32000	-	**8.1**	**8.6**	-	-
Benzene	3.3	19	3.6	-	ND	ND	-	-
Bromodichloromethane	NA	NA	0.76	-	ND	ND	-	-
Carbon disulfide	NA	NA	730	-	ND	ND	-	-
Chloroform	1.1	11	1.2	-	ND	ND	-	-
Chloromethane (Methyl Chloride)	94	280	94	-	ND	ND	-	-
cis-1,2-Dichloroethene	8.3	25	NA	-	ND	ND	-	-
Cyclohexane	NA	NA	6300	-	ND	ND	-	-
Dichlorodifluoromethane (Freon 12)	NA	NA	100	-	**2.3**	**2.4**	-	-

Sample ID	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)	OAQ (µg/m^3)	OAQ (µg/m^3)	OAQ (µg/m^3)	OAQ (µg/m^3)	OAQ- Vent 70 (µg/m^3)
Date				04/12/2019	06/04/2019	08/22/2019	9/15/19*	9/15/19*
Ethanol	19000	19000	NA	-	**7.9**	ND	-	-
Ethyl acetate	NA	NA	73	-	ND	ND	-	-
Ethylbenzene	10	100	11	-	ND	ND	-	-
m&p-Xylene	230	690	100	-	ND	ND	-	-
Methylene Chloride (Dichloromethane)	630	1000	630	-	ND	ND	-	-
Methyl-tert-butyl ether (MTBE)	98	980	110	-	ND	ND	-	-
Naphthalene	NA	NA	0.83	-	ND	ND	-	-
n-Heptane	NA	NA	NA	-	ND	ND	-	-
n-Hexane	730	2200	730	-	**0.82**	ND	-	-
o-Xylene	NA	NA	100	-	ND	ND	-	-
Propylene (Propene)	NA	NA	3100	-	**0.79**	ND	-	-
Styrene	NA	NA	1000	-	ND	ND	-	-
Tetrachloroethene	41	41	42	-	ND	ND	-	-
Tetrahydrofuran	NA	NA	2100	-	ND	ND	-	-
Toluene (Methylbenzene)	5200	7500	5200	-	**5.2**	**4.8**	-	-
Trans-1,2-Dichloroethene	270	790	NA	-	ND	ND	-	-
Trichloroethene	2	6	2.1	**3.5**	**4.6**	**18**	**1.8**	**190**
Trichlorofluoromethane (Freon 11)	NA	NA	NA	-	**1.1**	**1.3**	-	-
Vinyl Chloride	1.6	16	1.7	-	ND	ND	-	-
Xylenes	230	690	100	-	ND	ND	-	-

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

[c]VISL – EPA Vapor Intrusion Screening Level for residential indoor air exposures; the lowest of either the level equal to a Hazard Quotient of one or Cancer Risk of 1 in 100,000

[d]ND – Not detected at or above the reporting limit.

[e]NA – No screening level has been developed for this chemical.

- Chemical was not analyzed for

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 9. Date, sample ID, location, location description, and TCE concentration (in micrograms per cubic meter [µg/m^3]) for indoor and outdoor air data collected from and near the DCP site on 08/07/2019 and 08/08/2019 via HAPSITE mobile sampling and analysis equipment[1].

Date	Sample ID	Location	Location Description	TCE[a] (µg/m^3)
RIASL[b]				2
TSRIASL[c]				6
08/07/2019	3	NA[d]	Northwest Employee Parking lot at DCP	**0.333**
08/07/2019	4	Location 18 - Flower Shop	Flowers shop - near VP/large crack in floor	**0.674**
08/07/2019	5	Location 18 - Flower Shop	Flower Shop - storm catch basin (inside)	**0.82**
08/07/2019	6	Location 18 - Flower Shop	Flower Shop - sink/sanitary drain in back prep area	**0.788**
08/07/2019	7	Location 18 - Flower Shop	Flower Shop - front office area	**0.809**
08/07/2019	8	Location 18 - Flower Shop	Flower shop - OAQ on southwest building corner	**0.261**
08/07/2019	9	Location 10 - 522 S Michigan Ave	Near VP in basement	**5.31**
08/07/2019	10	Location 10 - 522 S Michigan Ave	Condensate drain (H2O in pipe) in basement	**4.55**
08/07/2019	11	Location 10 - 522 S Michigan Ave	Sanitary Clean out (2") in basement	**3.76**
08/07/2019	12	Location 17 - Shear Magic	VP location (front closet)	ND[e]
08/07/2019	13	Location 17 - Shear Magic	VP location (front closet)	ND
08/07/2019	14	Location 17 - Shear Magic	Janitorial sink located in closet (in hallway perpendicular to closet with VP)	ND
08/07/2019	15	Location 17 - Shear Magic	Void space near pea trap of janitorial sink in closet (same closet as sample ID 14)	**0.463**
08/07/2019	16	Location 17 - Shear Magic	OAQ at Shear Magic (E side of building)	**0.262**
08/07/2019	17	Location 17 - Shear Magic	Cleanout at DnA (business in same building as Shear Magic) bathroom	**0.43**
08/07/2019	18	Location 17 - Shear Magic	Shear Magic sink drain	**0.481**
08/07/2019	19	Location 16 - Water Tech	WaterTech - bathroom/VP	**0.406**
08/07/2019	20	Location 16 - Water Tech	WaterTech - Sanitary Cleanout in bathroom	**140.2**
08/07/2019	21	Location 16 - Water Tech	WaterTech - OAQ front parking	**0.529**
08/07/2019	22	Location 16 - Water Tech	WaterTech - OAQ front parking (DUP)	**0.22**
08/07/2019	23	Location 16 - Water Tech	WaterTech - Sanitary Cleanout in bathroom (DUP)	**205.5**

Date	Sample ID	Location	Location Description	TCE[a] (µg/m^3)
RIASL[b]				2
TSRIASL[c]				6
08/07/2019	24	Location 16 - Water Tech	WaterTech - lab area	**0.25**
08/07/2019	25	Location 14 - Spartan Tire	Spartan Tire - OAQ at NW corner	**0.236**
08/07/2019	26	Location 14 - Spartan Tire	Spartan Tire - PVC cleanout NW corner (exterior)	**0.25**
08/07/2019	27	Location 14 - Spartan Tire	Spartan Tire - PVC cleanout NE corner (exterior)	**0.236**
08/07/2019	28	Location 14 - Spartan Tire	Spartan Tire - VP/change room	**1.424**
08/07/2019	29	Location 14 - Spartan Tire	Spartan Tire - floor drain (change room bathroom)	**1.468**
08/07/2019	30	Location 12 - 603 S Michigan Ave	OAQ northwest of house	**5.045**
08/07/2019	31	Location 12 - 603 S Michigan Ave	VP in basement	**5**
08/07/2019	32	Location 12 - 603 S Michigan Ave	Sump pump in basement	**4.841**
08/07/2019	33	Location 12 - 603 S Michigan Ave	Inactive sanitary cleanout in basement	**3.779**
08/07/2019	34	Location 12 - 603 S Michigan Ave	Active sanitary cleanout in basement	**2.6**
08/08/2019	4	Location 26 - 604 S Michigan Ave (Diamond Chrome)	NW Employee parking lot at DCP	**2.199**
08/08/2019	5	Location 26 - 604 S Michigan Ave (Diamond Chrome)	DCP women's office bathroom drain	**51.28**
08/08/2019	6	Location 26 - 604 S Michigan Ave (Diamond Chrome)	DCP men's office bathroom drain	**51.26**
08/08/2019	7	Location 26 - 604 S Michigan Ave (Diamond Chrome)	DCP lab sample discharge to WWTP	**62.44**
08/08/2019	8	Location 26 - 604 S Michigan Ave (Diamond Chrome)	DCP SW Inactive cleanout SW corner (~6")	**181.8**
08/08/2019	9	Location 26 - 604 S Michigan Ave (Diamond Chrome)	DCP OAQ SW corner	**2.861**
08/08/2019	10	Location 26 - 604 S Michigan Ave (Diamond Chrome)	DCP sanitary cleanout SW corner (active)	**378.1**
08/08/2019	11	Location 11 - 519 S Michigan Ave	VP location in basement	**11.86**
08/08/2019	12	Location 11 - 519 S Michigan Ave	VP location in basement	**10.54**
08/08/2019	13	Location 11 - 519 S Michigan Ave	Sump pump in basement	**9.471**

Date	Sample ID	Location	Location Description	TCE[a] (µg/m^3)
RIASL[b]				2
TSRIASL[c]				6
08/08/2019	14	Location 11 - 519 S Michigan Ave	Sanitary cleanout in basement	**7.316**
08/08/2019	15	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Floor drain in DCP front office's (in closet)	**47.96**
08/08/2019	16	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Ambient air in front office conference room	**49.31**
08/08/2019	17	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Ambient Air in upstairs conference room	**49.21**
08/08/2019	18	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Location/vent # 39 on DCP roof	**40.97**
08/08/2019	19	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Location/vent # 69 on DCP roof	**1103.3**
08/08/2019	20	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Central west side of roof up gradient from vents based on wind	**3.029**
08/08/2019	21	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Location/vent # 70 on DCP roof	**1,267.9**
08/08/2019	22/23	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Location/vent # 71 on DCP roof	Results not reported
08/08/2019	24	Location 26 - 604 S Michigan Ave (Diamond Chrome)	East exterior roof location	Results not reported
08/08/2019	25	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Men's front office bathroom ambient air (drain sealed off with plastic); drain has permanent seal.	Results not reported
08/08/2019	26	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Men's front office bathroom ambient air (drain sealed off with plastic); drain has permanent seal.	**37.27**
08/08/2019	27	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Men's front office bathroom - sample collected under plastic seal for drain	**39.26**
08/08/2019	28	Location 26 - 604 S Michigan Ave	Women's front office bathroom ambient air (drain sealed off with	**34.93**

Date	Sample ID	Location	Location Description	TCE[a] (µg/m^3)
RIASL[b]				2
TSRIASL[c]				6
		(Diamond Chrome)	plastic)	
08/08/2019	29	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Women's front office bathroom - sample collected under plastic for sealed drain	**42.62**
08/08/2019	30	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Ambient air near MW-508 well in DCP plant	**29.86**
08/08/2019	31	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Headspace for MW-508 well in DCP plant	**1,220.7**
08/08/2019	32	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Ambient air near MW-501 well in DCP plant	**101.9**
08/08/2019	33	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Headspace for MW-501 well in DCP plant	**2,208.7**
08/08/2019	34	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Near vapor degreaser in DCP plant	**1,696.3**
08/08/2019	35	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Near vapor degreaser on steps in DCP plant	**1,744.9**
08/08/2019	36	Location 26 - 604 S Michigan Ave (Diamond Chrome)	Ambient air near NW overhead door & Cr-5 tank, beneath vent 70 in DCP plant	**1,998.1**
08/08/2019	37	NA	Ambient air west of Snedicor's Dry Cleaners	**27.56**
08/08/2019	38	NA	Ambient air west of Snedicor's Dry Cleaners	**21.56**
08/08/2019	39	NA	SW Manhole at Washington & Walnut St.	**18.88**
08/08/2019	40	NA	Manhole at Washington & Michigan Ave (dry; appeared to be Sanitary, but possibly SW)	**40.22**
08/08/2019	41	NA	Manhole at Walnut and Crane (appeared to be Sanitary)	**13.99**
08/08/2019	42	NA	Manhole at Walnut and Brooks (appeared to be Sanitary)	**13.29**
08/08/2019	43	NA	Sanitary manhole at Walnut & Livingston Ave (NE corner of road) near MW-701	**12.19**
08/08/2019	44	NA	SW MH at Walnut & Livingston (East)	**11.49**
08/08/2019	45	NA	Livingston Ave Sanitary MH in side walk (street MH inaccessible due to heavy traffic)	**14.7**

Date	Sample ID	Location	Location Description	TCE[a] ($\mu g/m^3$)
RIASL[b]				2
TSRIASL[c]				6
08/08/2019	46	NA	Sanitary MH in Livingston Ave & McCarthy appears to flow west toward Michigan Ave	**13.1**
08/08/2019	47	NA	Pinckney Ave Sanitary MH, South of DCP, between Spartan Tire and American Aqua	**10.1**
08/08/2019	48	NA	4-PIN-3 sanitary MH	**7.39**

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]TCE – Trichloroethylene

[b]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[c]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

[d]ND – Not detected at or above the reporting limit.

[e]NA – Location not listed in sampling report

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 10. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 11/04/2019 from the community around the DCP facility[1].

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)						
Sample ID				AA07-206SMWEST-110419 (µg/m^3)	AA07-206SMEAST-110419 (µg/m^3)	AA-LOT5-110419 (µg/m^3)	AA12-110419 (µg/m^3)	AA05-110419 (µg/m^3)	AA02-110419 (µg/m^3)
1,1,1-Trichloroethane	5000	5000	5200	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
1,1,2,2-Tetrachloroethane	NA[d]	NA	0.48	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
1,1,2-Trichloroethane	NA	NA	0.21	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
1,1-Dichloroethane	16	160	18	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethylene	210	630	210	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	NA	NA	NA	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2
1,2,3-Trichloropropane	NA	NA	0.31	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
1,2,3-Trimethylbenzene	63	190	62.6	**1.3**	<1.2	**1.4**	**1.3**	<1.2	**1.3**
1,2,4-Trichlorobenzene	2.1	6.3	2.1	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8
1,2,4-Trimethylbenzene	63	190	62.6	**3.2**	**2.5**	**6.4**	**5.7**	**3**	**4.5**
1,2-Dibromoethane	NA	NA	0.047	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	NA	NA	210	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
1,2-Dichloroethane	NA	NA	1.1	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99
1,2-Dichloropropane	NA	NA	2.8	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,3,5-Trimethylbenzene	63	190	62.6	**1.5**	<1.2	**1.5**	**1.3**	<1.2	**1.4**
1,3-Butadiene	NA	NA	0.94	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
1,3-Dichlorobenzene	3.1	9.3	NA	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
1,4-Dichlorobenzene	6.5	65	2.6	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
2,2,4-Trimethylpentane	NA	NA	NA	<1.2	<1.2	<1.2	<1.2	<1.2	**51**
2-Butanone (MEK)	NA	NA	5200	<15	<15	**240**	<15	<15	<15
2-Methylnaphthalene	NA	NA	NA	<29	<29	<29	<29	<29	<29
4-Methyl-2-pentanone (MIBK)	NA	NA	3100	<3.7	<3.7	<3.7	<3.7	<3.7	<3.7
Acetonitrile	NA	NA	63	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)						
Sample ID				AA07-206SMWEST-110419 (µg/m^3)	AA07-206SMEAST-110419 (µg/m^3)	AA-LOT5-110419 (µg/m^3)	AA12-110419 (µg/m^3)	AA05-110419 (µg/m^3)	AA02-110419 (µg/m^3)
Acrylonitrile	NA	NA	0.41	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99
Benzene	3.3	19	3.6	**1**	**1.4**	**0.99**	**1.2**	**0.88**	**1.4**
Bromodichloromethane	NA	NA	0.76	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Bromoform	NA	NA	26	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6
Bromomethane	NA	NA	5.2	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99
Carbon tetrachloride	NA	NA	4.7	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Chlorobenzene	52	160	52	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Chloroethane	4200	13000	10000	<0.67	<0.67	<0.67	<0.67	<0.67	<0.67
Chloroform	1.1	11	1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Chloromethane	94	280	94	**0.61**	**0.6**	**0.63**	**0.65**	**0.61**	**0.64**
cis-1,2-Dichloroethylene	8.3	25	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropylene	NA	NA	7	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Cyclohexane	NA	NA	6300	<0.87	<0.87	<0.87	<0.87	<0.87	**2.6**
Dibromochloromethane	NA	NA	NA	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Dichlorodifluoromethane	NA	NA	100	**2.3**	**2.3**	**2.3**	**2.3**	**2.2**	**2.3**
Ethylbenzene	10	100	11	**2.8**	<1.1	**1.8**	**1.3**	<1.1	**1.8**
Hexane	730	2200	730	<3.2	<3.2	<3.2	<3.2	<3.2	**7.5**
Isopropylbenzene	NA	NA	420	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
m & p - Xylene	230	690	100	**12**	**4.1**	**7.1**	**5.2**	**2.5**	**6.4**
Methylene chloride	630	1000	630	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Methyltertiarybutylether	98	980	110	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Naphthalene	NA	NA	0.83	<26	<26	<26	<26	<26	<26
n-Butylbenzene	NA	NA	NA	<5.3	<5.3	<5.3	<5.3	<5.3	<5.3
n-Propylbenzene	NA	NA	1040	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
o-Xylene	NA	NA	100	**5.3**	**2.3**	**3.8**	**2.8**	**1.7**	**3.6**
sec-Butylbenzene	NA	NA	NA	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
Styrene	NA	NA	1000	<1.1	<1.1	**1.1**	<1.1	<1.1	<1.1

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)						
Sample ID				AA07-206SMWEST-110419 (µg/m^3)	AA07-206SMEAST-110419 (µg/m^3)	AA-LOT5-110419 (µg/m^3)	AA12-110419 (µg/m^3)	AA05-110419 (µg/m^3)	AA02-110419 (µg/m^3)
Tetrachloroethylene	41	41	42	**2.8**	<1.7	<1.7	**3.6**	<1.7	<1.7
Toluene	5200	7500	5200	**4.2**	**4.2**	**3.6**	**2.5**	**1.1**	**7.2**
trans-1,2-Dichloroethylene	83	250	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropylene	NA	NA	7	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Trichloroethylene	2	6	2.1	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
Trichlorofluoromethane	NA	NA	NA	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
Vinyl chloride	1.6	16	1.7	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65

[1]Shading of sample results indicates exceedance of the respective screening level.
[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures
[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures
[c]VISL – EPA Vapor Intrusion Screening Level for residential indoor air exposures; the lowest of either the level equal to a Hazard Quotient of one or Cancer Risk of 1 in 100,000
[d]NA – No screening level has been developed for this chemical.
Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 10. Continued

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)				
Sample ID				AA09-110419 (µg/m^3)	AA-CRANE-110419 (µg/m^3)	AA-BROOKS110419 (µg/m^3)	AA-BROOKS110419-DUP (µg/m^3)
1,1,1-Trichloroethane	5000	5000	5200	<1.4	<1.4	<1.4	<1.4
1,1,2,2-Tetrachloroethane	NA[d]	NA	0.48	<1.7	<1.7	<1.7	<1.7

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)				
Sample ID				AA09-110419 (µg/m^3)	AA-CRANE-110419 (µg/m^3)	AA-BROOKS110419 (µg/m^3)	AA-BROOKS110419-DUP (µg/m^3)
1,1,2-Trichloroethane	NA	NA	0.21	<1.4	<1.4	<1.4	<1.4
1,1-Dichloroethane	16	160	18	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethylene	210	630	210	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	NA	NA	NA	<7.2	<7.2	<7.2	<7.2
1,2,3-Trichloropropane	NA	NA	0.31	<1.5	<1.5	<1.5	<1.5
1,2,3-Trimethylbenzene	63	190	62.6	<1.2	<1.2	<1.2	<1.2
1,2,4-Trichlorobenzene	2.1	6.3	2.1	<3.8	<3.8	<3.8	<3.8
1,2,4-Trimethylbenzene	63	190	62.6	**4.2**	**4**	**4**	**4**
1,2-Dibromoethane	NA	NA	0.047	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	NA	NA	210	<1.5	<1.5	<1.5	<1.5
1,2-Dichloroethane	NA	NA	1.1	<0.99	<0.99	<0.99	<0.99
1,2-Dichloropropane	NA	NA	2.8	<1.2	<1.2	<1.2	<1.2
1,3,5-Trimethylbenzene	63	190	62.6	<1.2	<1.2	<1.2	<1.2
1,3-Butadiene	NA	NA	0.94	<0.56	<0.56	<0.56	<0.56
1,3-Dichlorobenzene	3.1	9.3	NA	<1.5	<1.5	<1.5	<1.5
1,4-Dichlorobenzene	6.5	65	2.6	<1.5	<1.5	<1.5	<1.5
2,2,4-Trimethylpentane	NA	NA	NA	<1.2	<1.2	<1.2	<1.2
2-Butanone (MEK)	NA	NA	5200	<15	<15	<15	<15
2-Methylnaphthalene	NA	NA	NA	<29	<29	<29	<29
4-Methyl-2-pentanone (MIBK)	NA	NA	3100	<3.7	<3.7	<3.7	<3.7
Acetonitrile	NA	NA	63	<1.5	<1.5	<1.5	<1.5
Acrylonitrile	NA	NA	0.41	<0.99	<0.99	<0.99	<0.99
Benzene	3.3	19	3.6	**0.99**	**0.85**	**0.87**	**0.86**
Bromodichloromethane	NA	NA	0.76	<1.7	<1.7	<1.7	<1.7
Bromoform	NA	NA	26	<2.6	<2.6	<2.6	<2.6

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)				
Sample ID				AA09-110419 (µg/m^3)	AA-CRANE-110419 (µg/m^3)	AA-BROOKS110419 (µg/m^3)	AA-BROOKS110419-DUP (µg/m^3)
Bromomethane	NA	NA	5.2	<0.99	<0.99	<0.99	<0.99
Carbon tetrachloride	NA	NA	4.7	<1.6	<1.6	<1.6	<1.6
Chlorobenzene	52	160	52	<1.2	<1.2	<1.2	<1.2
Chloroethane	4200	13000	10000	<0.67	<0.67	<0.67	<0.67
Chloroform	1.1	11	1.2	<1.2	<1.2	<1.2	<1.2
Chloromethane	94	280	94	**0.63**	**0.65**	**0.62**	**0.61**
cis-1,2-Dichloroethylene	8.3	25	NA	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropylene	NA	NA	7	<1.2	<1.2	<1.2	<1.2
Cyclohexane	NA	NA	6300	<0.87	<0.87	<0.87	<0.87
Dibromochloromethane	NA	NA	NA	<2.2	<2.2	<2.2	<2.2
Dichlorodifluoromethane	NA	NA	100	**2.3**	**2.3**	**2.3**	**2.3**
Ethylbenzene	10	100	11	<1.1	<1.1	**1.1**	**1.2**
Hexane	730	2200	730	<3.2	<3.2	<3.2	<3.2
Isopropylbenzene	NA	NA	420	<1.2	<1.2	<1.2	<1.2
m & p - Xylene	230	690	100	**4.4**	**4.5**	**4.6**	**5.1**
Methylene chloride	630	1000	630	<1.1	<1.1	<1.1	<1.1
Methyltertiarybutylether	98	980	110	<1.6	<1.6	<1.6	<1.6
Naphthalene	NA	NA	0.83	<26	<26	<26	<26
n-Butylbenzene	NA	NA	NA	<5.3	<5.3	<5.3	<5.3
n-Propylbenzene	NA	NA	1040	<1.2	<1.2	<1.2	<1.2
o-Xylene	NA	NA	100	**2.6**	**2.6**	**2.6**	**2.8**
sec-Butylbenzene	NA	NA	NA	<1.4	<1.4	<1.4	<1.4
Styrene	NA	NA	1000	<1.1	<1.1	<1.1	<1.1
Tetrachloroethylene	41	41	42	<1.7	<1.7	**3.1**	**4.5**
Toluene	5200	7500	5200	**2.2**	**1.8**	**2.1**	**2.3**

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)				
Sample ID				AA09-110419 (µg/m^3)	AA-CRANE-110419 (µg/m^3)	AA-BROOKS110419 (µg/m^3)	AA-BROOKS110419-DUP (µg/m^3)
trans-1,2-Dichloroethylene	83	250	NA	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropylene	NA	NA	7	<1.2	<1.2	<1.2	<1.2
Trichloroethylene	2	6	2.1	**3.2**	**4**	**22**	**21**
Trichlorofluoromethane	NA	NA	NA	<1.4	<1.4	<1.4	<1.4
Vinyl chloride	1.6	16	1.7	<0.65	<0.65	<0.65	<0.65

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

[c]VISL – EPA Vapor Intrusion Screening Level for residential indoor air exposures; the lowest of either the level equal to a Hazard Quotient of one or Cancer Risk of 1 in 100,000

[d]NA – No screening level has been developed for this chemical.

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 11. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 11/19/2019 from the community around the DCP facility via 24-hour SUMMA canisters[1].

Sample ID	cis-1,2-Dichloroethylene (µg/m^3)	trans-1,2-Dichloroethylene (µg/m^3)	Tetrachloroethylene (µg/m^3)	Trichloroethylene (µg/m^3)	Vinyl chloride (µg/m^3)
RIASL[a] (µg/m^3)	8.3	83	41	2	1.6
TSRIASL[b] (µg/m^3)	25	250	41	6	16
TT-DCP-01-111919	<1.2	<1.2	<2.1	<1.6	<0.77
TT-DCP-02-111919	<1.2	<1.2	<2.1	<1.6	<0.77
TT-DCP-03-111919	<5.9	<5.9	<6.1	<0.16	<0.77
TT-DCP-04-111919	<5.9	<5.9	<6.1	<0.16	<0.77
TT-DCP-05-111919	<5.9	<5.9	<6.1	**0.17**	<0.77
TT-DCP-06-111919	<5.9	<5.9	<6.1	**0.2**	<0.77
TT-DCP-07-111919	<5.9	<5.9	<6.1	**0.23**	<0.77
TT-DCP-08-111919	<5.9	<5.9	<6.1	**0.81**	<0.77
TT-DCP-09-111919	<5.9	<5.9	<6.1	**1.8**	<0.77
TT-DCP-10-111919	<5.9	<5.9	<6.1	**0.2**	<0.77
TT-DCP-11-111919	<5.9	<5.9	<6.1	**0.17**	<0.77
TT-DCP-12-111919	<5.9	<5.9	<6.1	<0.16	<0.77
TT-DCP-13-111919	<5.9	<5.9	<6.1	**0.25**	<0.77
TT-DCP-14-111919	<1.2	<1.2	<2.1	<1.6	<0.77
TT-DCP-15-111919	<1.2	<1.2	<2.1	<1.6	<0.77
TT-DUP-01	<5.9	<5.9	<6.1	**0.18**	<0.77
13-AQD-DCP-111919	<1.2	<1.2	<2.1	<1.6	<0.77
16-AQD-DCP-111919	<1.2	<1.2	<2.1	<1.6	<0.77
17-AQD-DCP-111919	<1.2	<1.2	<2.1	<1.6	<0.77
18-AQD-DCP-111919	<1.2	<1.2	<2.1	<1.6	<0.77
19-AQD-DCP-111919	<1.2	<1.2	<2.1	<1.6	<0.77

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 12. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 11/20/2019 from the community around the DCP facility[1]. These are grab samples collected via Tedlar Bags and analyzed via HAPSITE.

	Trichloroethylene (µg/m^3)	Tetrachloroethylene (µg/m^3)
RIASL[a] (µg/m^3)	2	41
TSRIASL[b] (µg/m^3)	6	41
T-01 (upwind)	ND[c]	ND
T-02	ND	**0.34**
T-03	**8.4**	**0.28**
T-06	**3.8**	**0.28**
T-07	ND	**0.22**

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

[c]ND – Not detected at or above the reporting limit

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 13. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 11/20/2019 from the community around the DCP facility via 24-hour SUMMA canisters[1].

Sample ID	cis-1,2-Dichloroethylene (µg/m^3)	trans-1,2-Dichloroethylene (µg/m^3)	Tetrachloroethylene (µg/m^3)	Trichloroethylene (µg/m^3)	Vinyl chloride (µg/m^3)
RIASL[a] (µg/m^3)	8.3	83	41	2	1.6
TSRIASL[b] (µg/m^3)	25	250	41	6	16
TT-DCP-03-112019	<1.2	<1.2	<2.0	**1.5**	<0.77
TT-DCP-04-112019	<1.2	<1.2	<2.0	**1.8**	<0.77
TT-DCP-05-112019	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-06-112019	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-07-112019	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-08-112019	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-09-112019	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-10-112019	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-12-112019	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-13-112019	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DUP-02 (TT-DCP-06-112019)	<1.2	<1.2	<2.0	<1.6	<0.77

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 14. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 11/21/2019 from the community around the DCP facility[1]. These are grab samples collected via Tedlar Bags and analyzed via HAPSITE.

Sample ID	Trichloroethylene (µg/m^3)	Tetrachloroethylene (µg/m^3)
RIASL[a] (µg/m^3)	2	41
TSRIASL[b] (µg/m^3)	6	41
T-02/2	ND[c]	ND
T-03/2	**10.4**	ND
T-14	**2.93**	ND
T-15	ND	ND
T-16	**1.7**	ND
T-17	ND	ND

[1]Shading of sample results indicates exceedance of the respective screening level.
[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures
[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures
[c]ND – Not detected at or above the reporting limit
Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 15. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 11/21/2019 from the community around the DCP facility via 24-hour SUMMA canisters[1].

Sample ID	cis-1,2-Dichloroethylene (µg/m^3)	trans-1,2-Dichloroethylene (µg/m^3)	Tetrachloroethylene (µg/m^3)	Trichloroethylene (µg/m^3)	Vinyl chloride (µg/m^3)
RIASL[a] (µg/m^3)	8.3	83	41	2	1.6
TSRIASL[b] (µg/m^3)	25	250	41	6	16
TT-DCP-03-112119	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-04-112119	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-08-112119	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-09-112119	<1.2	<1.2	<2.0	**3.5**	<0.77
TT-DCP-20-112119	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-21-112119	<1.2	<1.2	<2.0	<1.6	<0.77
TT-DCP-22-112119	<1.2	<1.2	<2.0	<1.6	<0.77

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 16. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 11/22/2019 from the community around the DCP facility[1]. These are grab samples collected via Tedlar Bags and analyzed via HAPSITE.

Sample ID	Trichloroethylene (µg/m^3)	Tetrachloroethylene (µg/m^3)
RIASL[a] (µg/m^3)	2	41
TSRIASL[b] (µg/m^3)	6	41
T-03/3	ND[c]	ND
T-07/2	ND	**0.44**
T-06/2	ND	**0.56**
T-02/3	ND	ND
T-11	**0.704**	**0.34**
T-05	ND	ND
T-08	**2.14**	**0.22**
T-10	**0.736**	**0.23**
T-18	**0.816**	**0.23**
T-19	**1.34**	**0.19**
Storm Sewer at Washington & Walnut	**18.53**	**6.54**
Sanitary Sewer at Washington & Michigan	ND	**0.78**
Storm-01	**1.88**	**0.5**
Storm-02	**19.07**	**4.33**
Storm-03	ND	**0.2**
Storm-04	ND	**0.52**
Sanitary-01	ND	**0.3**
Sanitary-02	**0.288**	**0.35**
Sanitary-03	**1.422**	**0.36**

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

[c]ND – Not detected at or above the reporting limit

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 17. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 12/05/2019 from the community around the DCP facility[1].

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)					
Sample ID				BENNETT FIELD (µg/m^3)	MIDDLE OF LIVINGSTON (µg/m^3)	MICHIGAN AVE. (µg/m^3)	LIVINGSTON & FLEMING (µg/m^3)	UPWIND:END OF ISABEL (µg/m^3)
1,1,1-Trichloroethane	5000	5000	5200	<1.4	<1.4	<1.4	<1.4	<1.4
1,1,2,2-Tetrachloroethane	NA[d]	NA	0.48	<1.7	<1.7	<1.7	<1.7	<1.7
1,1,2-Trichloroethane	NA	NA	0.21	<1.4	<1.4	<1.4	<1.4	<1.4
1,1-Dichloroethane	16	160	18	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethylene	210	630	210	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	NA	NA	NA	<7.1	<7.1	<7.1	<7.1	<7.1
1,2,3-Trichloropropane	NA	NA	0.31	<1.5	<1.5	<1.5	<1.5	<1.5
1,2,3-Trimethylbenzene	63	190	62.6	<1.2	<1.2	<1.2	<1.2	<1.2
1,2,4-Trichlorobenzene	2.1	6.3	2.1	<3.7	<3.7	<3.7	<3.7	<3.7
1,2,4-Trimethylbenzene	63	190	62.6	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	NA	NA	0.047	<1.9	<1.9	<1.9	<1.9	<1.9
1,2-Dichlorobenzene	NA	NA	210	<1.5	<1.5	<1.5	<1.5	<1.5
1,2-Dichloroethane	NA	NA	1.1	<0.98	<0.98	<0.98	<0.98	<0.98
1,2-Dichloropropane	NA	NA	2.8	<1.2	<1.2	<1.2	<1.2	<1.2
1,3,5-Trimethylbenzene	63	190	62.6	<1.2	<1.2	<1.2	<1.2	<1.2
1,3-Butadiene	NA	NA	0.94	<0.56	<0.56	<0.56	<0.56	<0.56
1,3-Dichlorobenzene	3.1	9.3	NA	<1.5	<1.5	<1.5	<1.5	<1.5
1,4-Dichlorobenzene	6.5	65	2.6	<1.5	<1.5	<1.5	<1.5	<1.5
2,2,4-Trimethylpentane	NA	NA	NA	<1.2	<1.2	<1.2	<1.2	<1.2
2-Butanone (MEK)	NA	NA	5200	<15	<15	<15	<15	<15
2-Methylnaphthalene	NA	NA	NA	<29	<29	<29	<29	<29
4-Methyl-2-pentanone (MIBK)	NA	NA	3100	<3.7	<3.7	<3.7	<3.7	<3.7
Acetonitrile	NA	NA	63	<1.5	<1.5	<1.5	<1.5	<1.5

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)					
Sample ID				BENNETT FIELD (µg/m^3)	MIDDLE OF LIVINGSTON (µg/m^3)	MICHIGAN AVE. (µg/m^3)	LIVINGSTON & FLEMING (µg/m^3)	UPWIND:END OF ISABEL (µg/m^3)
Acrylonitrile	NA	NA	0.41	<0.98	<0.98	<0.98	<0.98	<0.98
Benzene	3.3	19	3.6	**1**	**1**	**1**	**0.97**	**0.96**
Bromodichloromethane	NA	NA	0.76	<1.7	<1.7	<1.7	<1.7	<1.7
Bromoform	NA	NA	26	<2.6	<2.6	<2.6	<2.6	<2.6
Bromomethane	NA	NA	5.2	<0.98	<0.98	<0.98	<0.98	<0.98
Carbon tetrachloride	NA	NA	4.7	<1.6	<1.6	<1.6	<1.6	<1.6
Chlorobenzene	52	160	52	<1.2	<1.2	<1.2	<1.2	<1.2
Chloroethane	4200	13000	10000	<0.66	<0.66	<0.66	<0.66	<0.66
Chloroform	1.1	11	1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Chloromethane	94	280	94	**0.58**	**0.6**	**0.63**	**0.62**	**0.63**
cis-1,2-Dichloroethylene	8.3	25	NA	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropylene	NA	NA	7	<1.1	<1.1	<1.1	<1.1	<1.1
Cyclohexane	NA	NA	6300	<0.87	<0.87	<0.87	<0.87	<0.87
Dibromochloromethane	NA	NA	NA	<2.1	<2.1	<2.1	<2.1	<2.1
Dichlorodifluoromethane	NA	NA	100	**2.3**	**2.3**	**2.3**	**2.3**	**2.3**
Ethylbenzene	10	100	11	<1.1	<1.1	<1.1	<1.1	<1.1
Hexane	730	2200	730	<3.2	<3.2	<3.2	<3.2	<3.2
Isopropylbenzene	NA	NA	420	<1.2	<1.2	<1.2	<1.2	<1.2
m & p - Xylene	230	690	100	<1.1	<1.1	<1.1	<1.1	<1.1
Methylene chloride	630	1000	630	<1.0	<1.0	<1.0	<1.0	<1.0
Methyltertiarybutylether	98	980	110	<1.6	<1.6	<1.6	<1.6	<1.6
Naphthalene	NA	NA	0.83	<26	<26	<26	<26	<26
n-Butylbenzene	NA	NA	NA	<5.3	<5.3	<5.3	<5.3	<5.3
n-Propylbenzene	NA	NA	1040	<1.2	<1.2	<1.2	<1.2	<1.2
o-Xylene	NA	NA	100	<1.1	<1.1	<1.1	<1.1	<1.1
sec-Butylbenzene	NA	NA	NA	<1.4	<1.4	<1.4	<1.4	<1.4

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)					
Sample ID				BENNETT FIELD (µg/m^3)	MIDDLE OF LIVINGSTON (µg/m^3)	MICHIGAN AVE. (µg/m^3)	LIVINGSTON & FLEMING (µg/m^3)	UPWIND:END OF ISABEL (µg/m^3)
Styrene	NA	NA	1000	<1.1	<1.1	<1.1	<1.1	<1.1
Tetrachloroethylene	41	41	42	<1.7	<1.7	<1.7	<1.7	<1.7
Toluene	5200	7500	5200	**2.1**	**1.6**	**4.1**	**1.8**	**1.6**
trans-1,2-Dichloroethylene	83	250	NA	**1.5**	<1.0	**1.2**	<1.0	<1.0
trans-1,3-Dichloropropylene	NA	NA	7	<1.1	<1.1	<1.1	<1.1	<1.1
Trichloroethylene	2	6	2.1	<1.4	<1.4	<1.4	<1.4	<1.4
Trichlorofluoromethane	NA	NA	NA	<1.4	<1.4	<1.4	<1.4	<1.4
Vinyl chloride	1.6	16	1.7	<0.64	<0.64	<0.64	<0.64	<0.64

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

[c]VISL – EPA Vapor Intrusion Screening Level for residential indoor air exposures; the lowest of either the level equal to a Hazard Quotient of one or Cancer Risk of 1 in 100,000

[d]NA – No screening level has been developed for this chemical.

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 18. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 12/06/2019 from the community around the DCP facility[1].

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)				
Sample ID				Crane St (µg/m^3)	Fleming and Brooks (µg/m^3)	Fleming and Railroad (µg/m^3)	Behind Chiropractor (µg/m^3)
1,1,1-Trichloroethane	5000	5000	5200	<8.2	<8.2	<8.2	<8.2
1,1,2,2-Tetrachloroethane	NA[d]	NA	0.48	<0.21	<0.21	<0.21	<0.21
1,1,2-Trichloroethane	NA	NA	0.21	<0.65	<0.65	<0.65	<0.65
1,1,2-Trichlorotrifluoroethane	NA	NA	31000	<23	<23	<23	<23
1,1-Dichloroethane	16	160	18	<6.1	<6.1	<6.1	<6.1
1,1-Dichloroethene	210	630	210	<5.9	<5.9	<5.9	<5.9
1,2,4-Trichlorobenzene	2.1	6.3	2.1	<22	<22	<22	<22
1,2,4-Trimethylbenzene	63	190	62.6	<4.4	<4.4	<4.4	<4.4
1,2-Dichlorobenzene	NA	NA	210	<9	<9	<9	<9
1,2-Dichloroethane	NA	NA	1.1	<0.49	<0.49	<0.49	<0.49
1,2-Dichloropropane	NA	NA	2.8	<1.4	<1.4	<1.4	<1.4
1,3,5-Trimethylbenzene	63	190	62.6	<4.4	<4.4	<4.4	<4.4
1,3-Butadiene	NA	NA	0.94	<0.18	<0.18	<0.18	<0.18
1,3-Dichlorobenzene	3.1	9.3	NA	<1.8	<1.8	<1.8	<1.8
1,4-Dichlorobenzene	6.5	65	2.6	<1.8	<1.8	<1.8	<1.8
1,4-Dioxane	NA	NA	5.6	<5.4	<5.4	<5.4	<5.4
2-Butanone	NA	NA	5200	<8.8	<8.8	<8.8	<8.8
2-Hexanone	NA	NA	31	<12	<12	<12	<12
2-Methylnaphthalene	NA	NA	NA	<35	<35	<35	<35
4-Methyl-2-pentanone	NA	NA	3100	<12	<12	<12	<12
Acetone	31000	31000	32000	<36	<36	<36	<36
Benzene	3.3	19	3.6	<2.9	<2.9	<2.9	<2.9
Benzyl Chloride	NA	NA	0.57	<0.41	<0.41	<0.41	<0.41

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)				
Sample ID				Crane St (µg/m^3)	Fleming and Brooks (µg/m^3)	Fleming and Railroad (µg/m^3)	Behind Chiropractor (µg/m^3)
Bromodichloromethane	NA	NA	0.76	<0.8	<0.8	<0.8	<0.8
Bromoform	NA	NA	26	<15	<15	<15	<15
Bromomethane	NA	NA	5.2	<3.5	<3.5	<3.5	<3.5
Carbon Disulfide	NA	NA	730	<19	<19	<19	<19
Carbon Tetrachloride	NA	NA	4.7	<0.75	<0.75	<0.75	<0.75
Chlorobenzene	52	160	52	<14	<14	<14	<14
Chloroethane	4200	13000	10000	<4	<4	<4	<4
Chloroform	1.1	11	1.2	<0.59	<0.59	<0.59	<0.59
Chloromethane	94	280	94	<12	<12	<12	<12
cis-1,2-Dichloroethene	8.3	25	NA	<5.9	<5.9	<5.9	<5.9
cis-1,3-Dichloropropene	NA	NA	7	<1.4	<1.4	<1.4	<1.4
Cyclohexane	NA	NA	6300	<10	<10	<10	<10
Dibromochloromethane	NA	NA	NA	<0.68	<0.68	<0.68	<0.68
Dichlorodifluoromethane	NA	NA	100	<15	<15	<15	<15
Ethyl Acetate	NA	NA	73	<11	<11	<11	<11
Ethylbenzene	10	100	11	<6.5	<6.5	<6.5	<6.5
Ethylene Dibromide	NA	NA	NA	<0.23	<0.23	<0.23	<0.23
Hexachlorobutadiene	NA	NA	1.3	<0.85	<0.85	<0.85	<0.85
Isopropanol	NA	NA	210	<15	<15	<15	<15
m & p - Xylene	230	690	100	<13	<13	<13	<13
Methylene Chloride	630	1000	630	<21	<21	<21	<21
MTBE	98	980	110	<5.4	<5.4	<5.4	<5.4
Naphthalene	NA	NA	0.83	<1.6	<1.6	<1.6	<1.6
n-Heptane	NA	NA	NA	<12	<12	<12	<12
n-Hexane	730	2200	730	<11	<11	<11	<11
o-Xylene	NA	NA	100	<13	<13	<13	<13

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)				
Sample ID				Crane St (µg/m^3)	Fleming and Brooks (µg/m^3)	Fleming and Railroad (µg/m^3)	Behind Chiropractor (µg/m^3)
Styrene	NA	NA	1000	<13	<13	<13	<13
Tetrachloroethene	41	41	42	<6.1	<6.1	<6.1	<6.1
Tetrahydrofuran	NA	NA	2100	<4.4	<4.4	<4.4	<4.4
Toluene	5200	7500	5200	<5.7	<5.7	<5.7	<5.7
trans-1,2-Dichloroethene	83	250	NA	<5.9	<5.9	<5.9	<5.9
trans-1,3-Dichloropropene	NA	NA	7	<1.4	<1.4	<1.4	<1.4
Trichloroethene	2	6	2.1	<0.16	<0.16	<0.16	<0.16
Trichlorofluoromethane	NA	NA	NA	<8.4	<8.4	<8.4	<8.4
Vinyl Acetate	210	630	210	<11	<11	<11	<11
Vinyl Chloride	1.6	16	1.7	<0.77	<0.77	<0.77	<0.77
Xylenes	230	690	100	<26	<26	<26	<26

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

[c]VISL – EPA Vapor Intrusion Screening Level for residential indoor air exposures; the lowest of either the level equal to a Hazard Quotient of one or Cancer Risk of 1 in 100,000

[d]NA – No screening level has been developed for this chemical.

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 19. Ambient air chemical concentrations (in micrograms per cubic meter [µg/m^3]) for data collected on 05/28/2020 from the community around the DCP facility[1].

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)					
Sample ID				OAQ – Upwind (µg/m^3)	OAQ - Center Street (µg/m^3)	OAQ - Crane (µg/m^3)	OAQ - Fleming (µg/m^3)	OAQ – Michigan (µg/m^3)
Acetone	31000	31000	32000	<36	<36	<36	<36	<36
Benzene	3.3	19	3.6	<2.9	<2.9	<2.9	<2.9	<2.9
Benzyl Chloride	NA	NA	0.57	<0.41	<0.41	<0.41	<0.41	<0.41
Bromodichloromethane	NA	NA	0.76	<0.8	<0.8	<0.8	<0.8	<0.8
Bromoform	NA	NA	26	<15	<15	<15	<15	<15
Bromomethane	NA	NA	5.2	<3.5	<3.5	<3.5	<3.5	<3.5
1,3-Butadiene	NA	NA	0.94	<0.18	<0.18	<0.18	<0.18	<0.18
2-Butanone	NA	NA	5200	<8.8	<8.8	<8.8	<8.8	<8.8
Carbon Disulfide	NA	NA	730	<19	<19	<19	<19	<19
Carbon Tetrachloride	NA	NA	4.7	<0.75	<0.75	<0.75	<0.75	<0.75
Chlorobenzene	52	160	52	<14	<14	<14	<14	<14
Chloroethane	4200	13000	10000	<4	<4	<4	<4	<4
Chloroform	1.1	11	1.2	<0.59	<0.59	<0.59	<0.59	<0.59
Chloromethane	94	280	94	<12	<12	<12	<12	<12
Cyclohexane	NA	NA	6300	<10	<10	<10	<10	<10
Dibromochloromethane	NA	NA	NA	<0.68	<0.68	<0.68	<0.68	<0.68
1,2-Dichlorobenzene	NA	NA	210	<9	<9	<9	<9	<9
1,3-Dichlorobenzene	3.1	9.3	NA	<1.8	<1.8	<1.8	<1.8	<1.8
1,4-Dichlorobenzene	6.5	65	2.6	<1.8	<1.8	<1.8	<1.8	<1.8
Dichlorodifluoromethane	NA	NA	100	<15	<15	<15	<15	<15
1,1-Dichloroethane	16	160	18	<6.1	<6.1	<6.1	<6.1	<6.1
1,2-Dichloroethane	NA	NA	1.1	<0.49	<0.49	<0.49	<0.49	<0.49
1,1-Dichloroethene	210	630	210	<5.9	<5.9	<5.9	<5.9	<5.9

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)					
Sample ID				OAQ – Upwind (µg/m^3)	OAQ - Center Street (µg/m^3)	OAQ - Crane (µg/m^3)	OAQ - Fleming (µg/m^3)	OAQ – Michigan (µg/m^3)
cis-1,2-Dichloroethene	8.3	25	NA	<5.9	<5.9	<5.9	<5.9	<5.9
trans-1,2-Dichloroethene	270	790	NA	<5.9	<5.9	<5.9	<5.9	<5.9
1,2-Dichloropropane	NA	NA	2.8	<1.4	<1.4	<1.4	<1.4	<1.4
cis-1,3-Dichloropropene	NA	NA	NA	<1.4	<1.4	<1.4	<1.4	<1.4
trans-1,3-Dichloropropene	NA	NA	NA	<1.4	<1.4	<1.4	<1.4	<1.4
1,4-Dioxane	NA	NA	5.6	<5.4	<5.4	<5.4	<5.4	<5.4
Ethyl Acetate	NA	NA	73	<11	<11	<11	<11	<11
Ethylbenzene	10	100	11	<6.5	<6.5	<6.5	<6.5	<6.5
Ethylene Dibromide	NA	NA	NA	<0.23	<0.23	<0.23	<0.23	<0.23
n-Heptane	NA	NA	NA	<12	<12	<12	<12	<12
Hexachlorobutadiene	NA	NA	1.3	<0.85	<0.85	<0.85	<0.85	<0.85
n-Hexane	730	2200	730	<11	<11	<11	<11	<11
2-Hexanone	NA	NA	31	<12	<12	<12	<12	<12
Isopropanol	NA	NA	210	<15	<15	<15	<15	<15
4-Methyl-2-pentanone	NA	NA	3100	<12	<12	<12	<12	<12
Methylene Chloride	630	1000	630	<21	<21	<21	<21	<21
2-Methylnaphthalene	NA	NA	NA	<35	<35	<35	<35	<35
MTBE	98	980	110	<5.4	<5.4	<5.4	<5.4	<5.4
Naphthalene	NA	NA	0.83	<1.6	<1.6	<1.6	<1.6	<1.6
Styrene	NA	NA	1000	<13	<13	<13	<13	<13
1,1,2,2-Tetrachloroethane	NA	NA	0.48	<0.21	<0.21	<0.21	<0.21	<0.21
Tetrachloroethene	41	41	42	<6.1	<6.1	<6.1	<6.1	<6.1
Tetrahydrofuran	NA	NA	2100	<4.4	<4.4	<4.4	<4.4	<4.4
Toluene	5200	7500	5200	<5.7	<5.7	<5.7	<5.7	<5.7
1,2,4-Trichlorobenzene	2.1	6.3	2.1	<22	<22	<22	<22	<22
1,1,1-Trichloroethane	5000	5000	5200	<8.2	<8.2	<8.2	<8.2	<8.2

	RIASL[a] (µg/m^3)	TSRIASL[b] (µg/m^3)	VISL[c] (µg/m^3)					
Sample ID				OAQ – Upwind (µg/m^3)	OAQ - Center Street (µg/m^3)	OAQ - Crane (µg/m^3)	OAQ - Fleming (µg/m^3)	OAQ – Michigan (µg/m^3)
1,1,2-Trichloroethane	NA	NA	0.21	<0.65	<0.65	<0.65	<0.65	<0.65
Trichloroethene	2	6	2.1	<0.16	<0.16	<0.16	<0.16	<0.16
Trichlorofluoromethane	NA	NA	NA	<8.4	<8.4	<8.4	<8.4	<8.4
1,1,2-Trichlorotrifluoroethane	NA	NA	31000	<23	<23	<23	<23	<23
1,2,4-Trimethylbenzene	63	190	63	<4.4	<4.4	<4.4	<4.4	<4.4
1,3,5-Trimethylbenzene	63	190	63	<4.4	<4.4	<4.4	<4.4	<4.4
Vinyl Acetate	210	630	210	<11	<11	<11	<11	<11
Vinyl Chloride	1.6	16	1.7	<0.77	<0.77	<0.77	<0.77	<0.77
m&p-Xylene	230	690	100	<13	<13	<13	<13	<13
o-Xylene	230	690	100	<13	<13	<13	<13	<13
Xylenes	230	690	100	<26	<26	<26	<26	<26

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

[c]VISL – EPA Vapor Intrusion Screening Level for residential indoor air exposures; the lowest of either the level equal to a Hazard Quotient of one or Cancer Risk of 1 in 100,000

[d]NA – No screening level has been developed for this chemical.

Sample ID – Sample IDs are arbitrary names selected solely for sampling and labeling purposes

Table 20. Sample date and maximum subslab TCE concentrations (in micrograms per cubic meter [µg/m^3]) detected beneath residential homes during a vapor intrusion investigation near the DCP site[1].

Date	Maximum TCE (µg/m^3)
RIASL[a]	67
TSRIASL[b]	200
03/12/2019	2.2
04/11/2019	ND
06/03/2019	ND
08/21/2019	18
05/28/2020	ND
08/26/2020	ND

[1]Shading of sample results indicates exceedance of the respective screening level.
[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential subslab soil gas
[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential subslab soil gas
[c]ND – Not detected at or above the reporting limit

Table 21. Sample date and maximum indoor air TCE concentration (in micrograms per cubic meter [µg/m^3]) detected in residential homes during a vapor intrusion investigation near the DCP site[1].

Date	Maximum TCE (µg/m^3)
RIASL[a]	2
TSRIASL[b]	6
03/12/2019	10
04/12/2019	0.69
06/04/2019	5.1
08/22/2019	20
09/15/2019	2.2
11/22/2019	ND [c]
05/28/2020	0.35
08/27/2020	ND

[1]Shading of sample results indicates exceedance of the respective screening level.

[a]RIASL – EGLE/MDHHS Recommended Interim Action Screening Level for residential indoor air exposures

[b]TSRIASL – EGLE/MDHHS Time-Sensitive RIASL for residential indoor air exposures

[c]ND – Not detected at or above the reporting limit

DIAMOND CHROME PLATING

NOVEMBER 21, 2019 PUBLIC MEETING[3]

Response to Community Questions

This document answers the questions that were asked during the Diamond Chrome Plating (DCP) Public Meeting hosted by the Department of Environment, Great Lakes, and Energy (EGLE); the Department of Health and Human Services (DHHS); and Livingston County Health Department (LCHD).

The answers are grouped by category or topic. Additionally, questions that covered the same concept were paraphrased into one question for ease of explanation.

All recorded questions are provided answers; however, if you do not see your question answered, please contact the appropriate department for more information.

Health-Related Questions:

Michigan Department of Health and Human Services Hotline 800-648-6942

Livingston County Health Department 517-546-9850

Environmental Evaluation Questions:

EGLE Environmental Assistance Center 800-662-9278

Human Exposure and Health

1. How much risk to our health was the exposure, especially for those that are pregnant and what actions should we take?

What would you advise to other residents that might have been affected by TCE?

The amount of TCE in outdoor air coming from Diamond Chrome Plating (DCP) showed there may have been some level of health risk, but the actual risk to an individual can't be determined. This is because we do not know how much TCE or for how long an individual breathed it in. Actions have been taken to remove the health risk. DCP has stopped using the TCE chemical since the Public Health Order was issued on November 18, 2019. Local and state agencies continue to regulate DCP operations to ensure that human health and the

[3] This document, Response to Community Questions - Health Concerns, can be found on the EGLE Diamond Chrome Plating Website

environment are protected. For more information regarding what actions you can take, please see the Outdoor Air and For Your Home sections of this document.

If you have health concerns about possible exposure to TCE, talk to your health care provider. You can also call MDHHS at 800-648-6942 to ask health-related questions. For more information about DCP and TCE, including detailed air sample results, please see the Ambient Air Sample Results section found on this website.

2. If the degreaser was in operation long term, how long were we exposed and what are the long- term exposure effects?

We can't determine how long any person may have been exposed to TCE. What was found in recent air quality tests does not provide any information about exposures from the past. We are not certain what the long-term health risks are. Long-term air data are not available.

Studies show that breathing in TCE may lead to certain health effects:

- Breathing TCE during pregnancy may cause heart defects in the developing fetus.
- Breathing TCE for a long time may affect the immune system.
- Breathing TCE over a lifetime can increase the risk of developing kidney cancer.
- There is also some evidence that TCE might increase the risk of developing non-Hodgkin's lymphoma (a type of blood cancer) or liver cancer.

Having TCE exposure does not mean you will have health issues now or in the future. A person's risk of developing health effects depends on how much TCE they breathe, how long they breathe it, and how their body reacts to it. If you are concerned that you may have health problems related to possible exposure to TCE, talk to your health care provider.

3. If TCE is breathed in, where does TCE go in the body?

When TCE is breathed in, some of it will be breathed out and some of it will move from the lungs into the blood. Once in the blood, TCE is distributed to other parts of the body where most of it is broken down into other chemicals. This mainly occurs in the liver. Most of the TCE that is broken down will leave your body in the urine within about a day. Once exposure stops, TCE will quickly leave the fat. If TCE is taken in faster than it can be broken down and removed, it may be stored in body fat for a brief period.

4. Are there specific medical tests to determine human exposure?

There are blood and urine tests that can check for TCE. These tests are not normally available through your doctor's office since they require special equipment and must be sent to certain laboratories. A test done a few days after exposure has stopped will not tell you how much TCE you were exposed to because TCE leaves the body quickly. Blood and urine tests will not tell

you if TCE has affected or could affect your health, or if a current health condition is caused by TCE. You can talk to your health care provider about whether any medical tests would be appropriate for you.

5. I have an infant that was born in the last two months, what should I do to make sure she doesn't have a heart defect?

Do kids need to have a cardiac workup if they feel they have been exposed?

The concern for heart defects is for exposure of the fetus during pregnancy when the heart is forming. If you have concerns that your children are having health problems related to possible exposure to TCE, talk to your health care provider.

6. I have a child and we go on walks near the facility. Should I be concerned for my child?

We do not have current scientific information showing children (up to age 18) would be affected differently than adults by TCE in the air. As with adults, breathing the highest levels of TCE detected in the community for a short period would not pose a health concern for children.

However, breathing these levels long-term could increase the risk of developing certain cancers and immune system effects. Once the source of TCE has stopped, the chemical is quickly reduced from the outdoor air. DCP has stopped using TCE chemical since the Public Health Order was issued on November 18.

7. Are people with respiratory issues who live near Diamond Chrome Plating more at risk?

The current scientific information does not show that a person with respiratory issues is at more of a health risk from breathing the levels of TCE that were detected near the DCP facility.

8. How do we monitor for future health risks, specifically cancer?

Michigan does have a Cancer Surveillance Program that keeps track of cancer diagnoses throughout the state for general monitoring purposes. However, this surveillance program collects a limited amount of data and does not record any information on how that individual may have developed cancer, such as through their exposure to chemicals. Given the estimated level of exposure and the number of people that were potentially exposed near the DCP facility, it would not be possible to use health monitoring data to accurately determine whether there has been an increase in cancer or other health effects. If you have health concerns related to TCE, talk to your health care provider.

For Your Home

9. How can I reduce the levels of TCE in my home? What brand and price are the air purifiers for those who want to protect their families?

If you're concerned about TCE in your home, you could have your air tested. If TCE is found in your home, you could buy an air purifier. Air purifiers that contain at least 15 pounds of activated carbon have been effective in reducing indoor air levels of TCE. These units generally cost around $400-$700. Product manufacturers should be able to provide information about whether a particular air purifying unit would meet your needs.

TCE can also be found in some household products such as gun cleaner and automotive brake cleaner. If you have these products, store them safely in a shed or garage that is not attached to your home. Make sure containers are closed tightly to prevent vapors from escaping. If you would like to learn how to dispose of household chemicals safely, please refer to the Household Hazardous Waste page on the Livingston County website, www.livgov.com.

10. Is there a home air tester? Are there detectors you can get for your home?

We are not aware of home air testing kits or home detectors to identify TCE in the amounts that would pose health risks.

11. Will a radon mitigation system reduce the amount of TCE in the indoor air?

A radon mitigation system is similar to the systems used to prevent chemicals like TCE from coming into the home. However, the indoor air would need to be tested to see if a radon mitigation system is effective at reducing TCE that may be entering a home from subsurface (below the ground) contamination.

Outdoor Air Quality & Testing

12. Are we looking at quality of air around schools?

Yes, outdoor air samples were taken at three locations next to daycare centers and two locations next to schools. These air samples were taken using 24-hour SUMMA canisters. They came back as non-detect, meaning TCE was not found. Detailed information on the sample results are available online. Please see the Ambient Air Sample Results section found on this website.

13. How long does TCE stay in the air?

Once the source of TCE has stopped, the chemical breaks down relatively quickly in the outdoor air. This can happen within a few hours, depending on the wind speed. Since the Public Health Order was issued on November 18, 2019, DCP has stopped using the TCE chemical.

14. How long will the SUMMA canisters stay in place?

SUMMA canisters stay in place for 24 hours. It takes a few days to a few weeks to receive the sample results. Detailed information on the air sample results are available online. Please see the Ambient Air Sample Results section found on this website.

15. What were the outdoor air levels that triggered the Public Health Order to be issued?

The outdoor air sampling results that prompted the current public health action included a maximum TCE level of 22 micrograms per cubic meter ($\mu g/m^3$). This is about 10 times greater than the health-based screening level of 2 $\mu g/m^3$, which protects against heart defects in the developing fetus. Immediate action was necessary because short term exposure of pregnant women above this level could pose a health risk to the developing fetus.

Agriculture and Pets

16. Does TCE build up in grass and should there be a concern for dogs that eat grass?

Should I be concerned with eating the food that food I grow in my garden?

TCE does not generally build up in plants. If there is any TCE in plants, it tends to leave the plant and move into the air. We do not expect that TCE moved from the air into plants grown near the DCP facility at levels that would have posed a health risk to people eating vegetables or to dogs eating grass.

17. We raise chickens and eat their eggs, does TCE build up in chicken eggs and become dangerous to eat, specifically for children?

TCE does not generally build up in animals. We do not expect that the levels of TCE that were found in the air near the DCP facility could have accumulated in chicken eggs in amounts that would be harmful to the health of adults or children eating the eggs.