Q3 2021 – Q4 2023 CHRONIC RISK ASSESSMENT
COMMERCE CITY NORTH DENVER
COMMUNITY AIR MONITORING NETWORK

COMMERCE CITY, COLORADO

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Document Number: **085AA-022561-RT-93**
Report Period: **Q3 2021 – Q4 2023**
Submittal Date: **February 15, 2024**

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EXECUTIVE SUMMARY

In response to feedback received by Suncor Energy (U.S.A.) Inc. (Suncor) through community engagement conducted in the fall of 2020, Suncor voluntarily committed to developing a continuous, near real-time air monitoring program to gain insight into air quality for neighborhoods in the vicinity of the Suncor refinery in Commerce City, Colorado. Montrose Environmental Group - Air Quality Services, LLC (Montrose) was contracted by Suncor to deploy, operate, and maintain the network in the Commerce City and North Denver (CCND) neighborhoods. Air monitoring was accomplished through three separate technical approaches: (1) continuous, near real-time monitoring for the following analytes[1]: carbon monoxide (CO), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), nitric oxide or nitrogen oxide (NO), nitrogen dioxide (NO_2), particulate matter ($PM_{2.5}$), and total volatile organic compounds (VOCs); (2) periodic collection and laboratory analysis for the presence of specific VOCs from six-liter evacuated stainless steel ("Summa") canisters, and (3) periodic real-time air monitoring throughout neighborhoods using a mobile monitoring van to detect presence of specific VOCs and hydrogen sulfide (H_2S).

Health scientists from CTEH, LLC (CTEH®) (a subsidiary company of Montrose) performed a screening-level human health risk assessment based on the data collected by Montrose. This evaluation was consistent with federal and state risk assessment guidelines and was conducted to determine whether the average measured concentrations of individual or cumulative (combined) VOCs could potentially pose chronic (long-term) non-cancer or cancer health hazards. Acute health risks assessments were also completed and are presented in previous quarterly reports.

Approximately 405,799 one-hour rolling average concentration measurements and 183 Summa canister samples were collected in six CCND Air Monitoring neighborhoods using two specific data collection platforms. Forty-three summa canister samples were also collected in identical fashion from three reference sites approximately 4 to 13 miles away from the Suncor facility to compare with the CCND neighborhood sample data. For each neighborhood, sampling location or reference site, the time weighted average (Summa canister data) or average (mobile monitoring van) concentration measured across ten quarters (third quarter of 2021 through fourth quarter of 2023) were compared to chronic non-cancer health Reference Levels (RL). This is called a chronic Hazard Quotient (HQ). The Hazard Indices (HI) represent cumulative risks from exposure to all detected chemicals measured in a given neighborhood or sampling site. The HI is determined by adding together the HQs. According to United States Environmental Protection Agency (USEPA) guidelines, a chronic HQ or HI less than or equal to one (1) indicates that exposure is not likely to result in chronic non-cancer adverse health effects, even for sensitive sub-populations. Additionally, excess cancer risks were evaluated.

The non-cancer risk assessment resulted in the following overall findings:

- The data collected during this study phase did not indicate a potential for chronic non-cancer adverse health effects from exposure to the measured chemicals, both individually and cumulative, in either the CCND neighborhoods or the reference sites.

[1] An "analyte" is a material that a measuring device is designed to detect and measure. It may be a chemical gas, an airborne particle, or other type of material.

  - All estimated chronic HQ and HI values for non-cancer adverse health effects in each CCND neighborhood were below one.

  - All estimated chronic HQ and HI values for non-cancer adverse health effects at each reference site were also below one.

The cancer risk assessment showed the following:

- For average potential exposures, the calculated risks were within the range deemed by USEPA and referenced by Colorado Department of Public Health and Environment (CDPHE) as an acceptable risk.

  - All chemical-specific and total (cumulative) excess cancer risks fell between the USEPA and CDPHE-acceptable range of 1 in 10,000 to 1 in a million chances of excess risk for developing cancer above background risks, which are typically one in two for men and one in three for women in the United States.

- The average cancer risks estimated for CCND neighborhoods were very similar to the risks calculated for the three reference sites, suggesting similar cancer risks for an individual spending an entire lifetime in a CCND neighborhood or at one of the reference sites outside of a CCND neighborhood.

1.0 INTRODUCTION

In response to feedback received by Suncor Energy (U.S.A.) Inc. (Suncor) through community engagement conducted in 2020, Suncor voluntarily committed to developing a continuous, near real-time air monitoring program to gain insight into air quality for neighborhoods in the vicinity of the Suncor refinery in Commerce City, Colorado. Montrose Environmental Group - Air Quality Services, LLC (Montrose) was contracted by Suncor to deploy, operate, and maintain the network in the Commerce City and North Denver (CCND) neighborhoods. Air monitoring was accomplished through three separate technical approaches:

1. Continuous, near real-time stationary monitoring for the following analytes: carbon monoxide (CO), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), nitric oxide or nitrogen oxide (NO), nitrogen dioxide (NO_2), particulate matter ($PM_{2.5}$), and total volatile organic compounds (VOCs),

2. Periodic sample collection using Summa canisters and laboratory analysis for the presence of specific VOCs, and

3. Periodic real-time air monitoring throughout neighborhoods using a mobile monitoring van to detect presence of specific chemicals.

An "analyte" is a material that a measuring device is designed to detect and measure. It may be a chemical gas, an airborne particle, or other type of material.

Air monitoring data from approaches #2 and #3 have been used for screening level assessments of potential human health risk from acute-duration (hours to days) and chronic (lifetime) exposures to specific chemicals in the CCND community air. The acute risk assessments were based on data collected during a specific calendar quarter and published on a quarterly basis. Data collected using approach #1 was not included because the analytes measured for approach #1 (except for H_2S) do not have established health reference levels or cancer potency factors needed to perform a screening level health risk assessment. Risk associated with potential H_2S exposure was addressed in the assessment of the mobile monitoring van data. The risk assessments were developed assuming short-term (one to four hours) exposures to airborne analytes within a monitored CCND neighborhood. Reports of these acute risk assessments are available online at ccnd-air.com/documents.

This report contains a screening-level health risk assessment (both non-cancer and cancer endpoints) of potential chronic exposures in CCND neighborhoods to VOCs and H_2S, building upon the previous chronic risk assessment with an additional three quarters worth of data. Non-cancer health outcomes vary widely by chemical, but the most sensitive health outcome for each chemical was used for this assessment. The risk assessment is based on the air monitoring data from approaches #2 and #3 collected periodically over the ten-quarter period (third quarter of 2021 through the fourth quarter of 2023). The definition of chronic human exposure varies across regulatory agencies and scientific bodies. In general, toxicologists define chronic human exposures as repeated exposures occurring for many months to years[2]. The risk assessment presented herein provides estimates of lifetime inhalation non-cancer and cancer risks for CCND communities based on data collected on a quarterly basis for two years and based on the

[2] Casarett & Doull's Toxicology: The Basic Science of Poisons. 7th Edition.

assumption that data from these sampling periods represent airborne chemical levels present over years of time. Refined estimates of chronic health risks may be developed as more data are collected through the CCND Air Monitoring program.

2.0 METHODS

2.1 AIR MONITORING METHODS

The chronic non-cancer and cancer health risk assessment was developed using air monitoring data from Summa canister analysis and mobile monitoring van tours in the CCND neighborhoods from the third quarter of 2021 through the fourth quarter of 2023. The following discussion briefly describes the two different air monitoring processes. Detailed air monitoring methods are provided in Appendix A.

Summa Canister Methods

Planned and VOC sensor-triggered air samples were collected periodically over a ten-quarter period. During that period, there were originally eight CCND locations, but that number expanded to ten (CM-1 through CM-10 shown in Figure 2-1) and three non-CCND reference sites (Denver Colorado Department of Public Health and Environment (CDPHE) office; Brighton, CO; junction of E470 and I-25) from which samples were collected for all quarters. The reference locations were selected so that air quality of CCND neighborhoods could be directly compared with air quality in areas not directly impacted by the various and multiple sources of chemicals found in the vicinity of the CCND neighborhoods. Planned one-hour air samples were collected by a field technician on pre-determined dates. Sensor-triggered samples were collected automatically when instantaneous total VOCs were detected on that location's total VOC sensor at an airborne concentration of one part per million (ppm) or higher for one minute or longer. Beginning in the third quarter of 2022, a single 7-day Summa cannister sample was collected from each of the ten sampling locations and reference locations. The decision to add a quarterly 7-day sample to the program was based on the need to better discriminate typical airborne VOC levels at a given location from atypical, transient levels of VOCs that may be observed in the shorter 1-hour planned or triggered samples, as described in the following paragraph. The addition of 7-day Summa canister samples to the program also provides data spanning a much longer time period than the quarterly planned or triggered 1-hour samples, which results in a more robust estimate of typical VOC levels over longer time periods and, subsequently, a more representative estimate of lifetime exposure concentrations and chronic risk assessment. Both the 1-hour and 7-day samples were used together to calculate chronic noncancer and cancer health risks, as described in Sections 2.2 and 2.3.

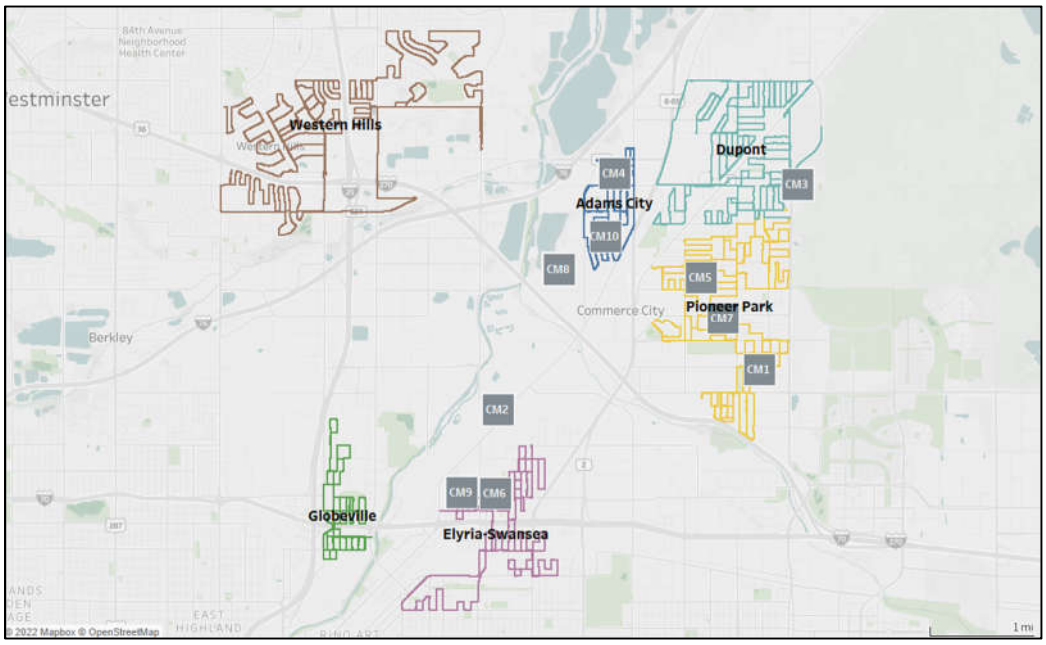
A total of 183 air samples were collected within the CCND neighborhoods (159 planned and 24 sensor-triggered). Planned samples included 1-hour and 7-day sample durations. An additional 43 samples were collected across three non-CCND community monitoring reference sites (1-hour and 7-day samples). In Q1 2023, the 7-day sample at JUNC location was not collected at the request of the property owner and a new location was therefore determined for Q2 2023 sample collection. All air samples were collected using Summa canisters and sent to an accredited laboratory for analysis of 59 VOCs in accordance with the USEPA methods TO-15 and TO-14.

Mobile Monitoring Van Methods

The mobile monitoring van contains the equipment necessary to identify and quantitate individual chemicals present in ambient air at ultra-low concentrations. This equipment measures and reports concentrations of 65 select chemicals (64 VOCs plus H_2S) at sub-parts per billion (ppb) levels and as quickly as one measurement per second. During the ten quarterly monitoring periods, the mobile monitoring van travelled a dense route through six CCND residential neighborhoods (colored routes shown in Figure 2-1) within a three-mile radius around the refinery. Accessible streets in the monitored neighborhoods were traversed at approximately 10 miles per hour while collecting a data point for each chemical every second. From 2021 through 2023, the mobile monitoring van sampled a total of six neighborhoods on a quarterly basis, and collected over 643,163 data points, resulting in approximately 405,799 one-hour rolling average concentrations.

FIGURE 2-1

Mobile Monitoring Van Program Route and Summa Canister Sampling Locations in Six Neighborhood Areas



2.2 NON-CANCER SCREENING HEALTH RISK ASSESSMENT

CTEH conducted a screening-level public health risk assessment, consistent with federal risk assessment guidelines, to determine whether exposure to the detected concentrations of individual or cumulative (combined) chemicals in the air could potentially pose chronic (long-term) non-cancer and cancer adverse health effects. A tiered approach to the risk assessment was used. This approach involves one or more iterative steps (or tiers) being performed in which health risks may be calculated and evaluated multiple times.

The first tier of this risk assessment process is called a screening-level risk assessment. The conservative assumptions used for this level of risk calculation typically represent exposure conditions higher than would be reasonably expected. As such, an exceedance of an acceptable risk level (defined below) does not necessarily indicate that adverse health effects are likely. The Agency for Toxic Substances and Disease Registry (ATSDR) states, "*when health assessors find exposures higher than the MRLs (ATSDR's specific health-based reference levels), it means that they may want to look more closely at a site*"[3]. In other words, screening-level findings of an estimated exposure to a specific or combined set of chemical(s) being higher than its health reference level (RL) does NOT indicate an actual likelihood of adverse effects but does indicate a need to move to a second tier of analysis and refine the risk assessment process with more realistic detail to determine if an actual risk exists that needs to be mitigated.

Such calculations assume a person is constantly exposed to each detected chemical continuously for a chronic duration. If the resulting risk values indicate the lack of likely chronic adverse health effects under these worst-case conditions, then the risk assessment is complete. However, if the risk values suggest a potential for chronic adverse health effects, then a second tier of risk calculations are performed, but this time using more detailed assumptions about exposure that are still simple representations of the real world but are more realistic than the first-tier worst-case assumptions. Each successive tier represents a more complete characterization of exposure variability and/or uncertainty that requires a corresponding increase in calculation complexity and scientific level of effort.

The screening-level risk assessment reported here includes calculated chronic risks from exposure to individually measured chemicals as well as exposure to all measured chemicals at once (cumulative). For individual chemicals, a chronic non-cancer health risk value was calculated as the exposure concentration (EC) divided by the chemical-specific federal or state established chronic RL (Equation 1). The result is referred to as the hazard quotient (HQ).

Eq. 1 – Hazard Quotient (HQ) Equation

$$HQ = EC / RL$$

Where:

HQ = Hazard Quotient

EC = Summa canister time-weighted-average air concentration or mobile monitoring van average air concentration of the chemical.

RL = Chronic Health-based Reference Level (EPA, ATSDR, Cal EPA OEHHA, and TCEQ).

For the Summa canister data, the EC for each chemical was assumed to be the time-weighted average concentration of all 1-hour and 7-day samples collected across ten quarters at each location. Time-weighted averaging of airborne chemical concentrations is a method of combining air data sampled at different sampling durations. It allows for a more accurate estimate of airborne chemical levels over a longer time period while preventing sample results from shorter duration

[3] https://www.atsdr.cdc.gov/minimalrisklevels/#:~:text=The%20ATSDR%2C%20in%20response%20to,minimal%20risk%20levels%20(MRLs)

samples (1-hour samples in the case of the CCND program) to inappropriately dominate the average levels for the chronic duration assessment period. Time-weighted averages of VOC concentrations measured in all of the 1-hour planned and triggered samples and 7-day planned samples collected over ten quarters were calculated using Equation 2, per USEPA guidance[4].

Eq. 2 – Time-Weighted Average Exposure Concentration for Summa Canister Data

$$EC_{TWA} = \frac{\sum_1^n (C_j \times t_j)}{T}$$

Where:

EC_{TWA} *= Time-weighted average exposure concentration over ten quarters at a single location*

C_i *= Chemical concentration from a single 1-hour or 7-day Summa canister sample*

t_i *= Sampling duration from a single 1-hour or 7-day Summa canister sample*

T = Total sampling averaging time from all 1-hour and 7-day Summa canister samples over ten quarters at a single location

For the mobile monitoring van data, the estimated EC for each chemical was assumed to be the average of the one-hour rolling average concentration collected across ten quarters in an individual CCND neighborhood. A time-weighted average concentration is not calculated for the mobile monitoring van data because the 1-hour rolling averages used as the basis for EC are already equally weighted in terms of exposure duration. Use of the Summa canister EC_{TWA} assumes that airborne chemical levels measured at the monitoring location are representative of the entire neighborhood, while the ECs from the mobile monitoring van data represent a larger actual footprint of individual neighborhood exposure.

The RLs used to calculate the chronic HQs are previously established exposure levels below which no non-cancer adverse health effect in humans is expected. If available, RLs adopted by CDPHE were selected for use within this assessment and include USEPA chronic reference concentration (RfC) and residential screening levels (RSLs); ATSDR chronic minimum risk levels (MRLs); California EPA's Office of Environmental Health Hazard Assessment (OEHHA) chronic risk levels; and Texas Commission on Environmental Quality (TCEQ) chronic, long-term air monitoring comparison values (AMCV). If the chemical was not listed by CDPHE, a federal and state recommended hierarchy for selection of RLs was used[5]. Where the mobile monitoring van was unable to differentiate between specific chemicals, the lowest, most health-protective RL of the "isomer" group was selected for use in that analysis. Group details are provided in the appendix.

Health risks from potential cumulative exposures to all detected chemicals were calculated by adding together each individual chemical's average chronic HQ calculated over ten quarters for a given neighborhood. The sum of all the individual chronic HQs is called a chronic Hazard Index (HI). Adding together all the chronic HQs is also a very health-conservative approach because it

[4] USEPA (2004). Air Toxics Risk Assessment Reference Library. Volume 1 Technical Reference Library
[5] CDPHE (2019) Memo: Updated acute and chronic health guideline values for use in preliminary risk assessments (referred to as "FA2019 HGVs"); https://drive.google.com/file/d/1P2KEvu0MFiyzQAOQtjQUclqR-WGh1bEX/view

assumes that all the measured chemicals exert an adverse effect on the body in a similar manner, which is rarely the case.

A chronic HQ or HI of less than or equal to one is an indication that the estimated exposure is likely to be without an appreciable risk of adverse chronic non-cancer health effects, even for sensitive sub-populations. The potential for adverse health effects increases as chronic HQ or HI increase above one, but it is not known by how much. Chronic HQ or HI values of greater than one would prompt a second-tier risk assessment beyond the screening-level assessment.

According to the USEPA and ATSDR, the federal agencies that establish these RLs, these values "*are set below levels that, based on current information, might cause adverse health effects in the people most sensitive*."[6] This is because RLs are based on observed toxicity in human or animal studies with an added safety factor to account for uncertainties and variabilities in the toxicity data. For example, ATSDR identified the lowest observed adverse effect level (LOAEL) for chronic exposure to benzene as 100 parts per billion (ppb), based on a human epidemiology study of adult workers. ATSDR then applied a combined safety factor of 3 to derive the final RL to account for uncertainty in sensitivity to benzene's chronic effects across the general human population. Therefore, it is scientifically incorrect to assume that all real-world exposures to an analyte at levels at or slightly higher than a RL will likely result in an adverse effect.

Using the average concentration for the EC (mobile monitoring van data) or EC_{TWA} (Summa canister data) across quarters assumes that airborne levels of a chemical vary over time similarly to what was observed during Summa canister sampling and mobile monitoring van sampling. It is also assumed that an individual occupies the monitored neighborhood and breathes this concentration continuously for months to years (chronic exposure)[7].

2.3 CANCER SCREENING HEALTH RISK ASSESSMENT

CTEH also conducted a screening-level health risk assessment to determine whether chronic inhalation exposure to the detected concentrations of individual or cumulative chemicals in the air could potentially cause the development of cancer. The cancer risk assessment was also performed using methods consistent with federal risk assessment guidelines. Among the chemicals measured by Montrose using Summa canisters and the mobile monitoring van, there are five chemicals that are categorized by various regulatory agencies (USEPA, OEHHA, and TCEQ) as probable or possible carcinogens: benzene; ethylbenzene; 1,3-butadiene; isoprene; and tetrachloroethene. Cancer risk for this assessment is defined as the likelihood that "*a person may develop cancer over the course of their lifetime as a result of the exposures under study. This risk is the incremental risk of cancer from the exposure being analyzed that is above the risk that the individuals in the population have already (i.e., due to non-air toxics related issues)*"[8].

Cancer risks were calculated for a hypothetical person occupying a CCND neighborhood and any one of the three non-CCND reference sites for their entire lifetime. Risks from a lifetime exposure to each of the five carcinogenic chemicals listed above and the total (cumulative) risks from exposure to all five simultaneously were calculated. Separate calculations of risk were performed

[6]https://www.atsdr.cdc.gov/mrls/index.html#:~:text=ATSDR%20uses%20the%20no%20observed,to%20such%20substance%2Dinduced%20effects.
[7] Casarett & Doull's Toxicology: The Basic Science of Poisons. 7th Edition.
[8] USEPA (2004). Air Toxics Risk Assessment Reference Library. Volume 1 Technical Reference Library.

for Summa canister data and mobile monitoring van data. The reason for separate calculations based on canister and van data is discussed below.

The difference in approach to calculating non-cancer risk (as described in Section 2.2) and cancer risk is based on toxicological understanding of the mechanisms by which chemicals exert their toxic effects on the body. Non-cancer effects occur when a chemical concentration in the body surpasses the body's ability to either clear the chemical from the affected tissue or organ or to compensate for the presence of the chemical (initiating protective biochemical processes to offset the effect of the chemical). The toxic threshold is the exposure level and duration above which the chemical exposure overcomes the body's ability to compensate. Thus, any exposure below the toxic threshold is assumed to be dealt with by the body's protective processes and will not cause an adverse health effect. Cancer effects are different from non-cancer effects because the carcinogen affects the body's ability to control cell growth, either by directly or indirectly changing the body's genetic control mechanisms. Theoretically, a single change of genetic material or genetic controls could cause cell growth and replication to occur uncontrollably, leading to tumor formation. However, the body's many built-in processes to identify and reverse such occurrences are very effective in countering such insults to genetic control. Chemical carcinogen-caused cancers may occur due to exposures levels that are too high and occur for too long of a duration for the body to reverse the genetic damage and loss of control of cell proliferation. A person's inherited ability to correct damage to cell genetics may also impact their risk of developing cancer by chance or from chemical exposure.

Scientists studying chemical carcinogenesis (the ability of a chemical to cause cancer) have debated for decades whether certain chemical carcinogens have a threshold exposure below which genetic loss of control (and, thus, cancer) will not happen. For this reason, risk assessment methods used by regulatory bodies conservatively assume that a risk exists for a carcinogen to cause cancer to develop, even at extremely low exposure levels. For environmental exposures, such assumed risks from ppb-levels of inhalation exposures would take decades of exposure to result in cancer. Cancer risks are calculated not by comparing exposure to a health reference level to see if an exceedance has occurred, but by multiplying by a cancer potency factor to estimate a likelihood of cancer occurring over a lifetime. Cancer potency factors for inhaled carcinogens have been determined by USEPA and other federal and state regulatory agencies. These potency factors are based on observed tumor development in laboratory animal and human epidemiology studies.

Just like non-cancer health reference levels, cancer potency factors include adjustments to err on the side of caution when there are uncertainties in differences between animal and human sensitivity to a carcinogen as well as differences between humans with genetic sensitivity based on health status, genetic background, and stage of life (very young or very old). Thus, a cancer risk estimate has built into it a conservative level of safety and likely overestimates actual risk.

Cancer risks calculated in this assessment are for inhalation of airborne carcinogens only. Equation 3 (from USEPA guidance[9]) was used to calculate each chemical-specific cancer risk.

[9] USEPA (2004). Air Toxics Risk Assessment Reference Library. Volume 1 Technical Reference Library

Eq. 3 – Excess Cancer Risk Estimate Equation

Cancer Risk = EC (or EC_{TWA}) x IUR

Where:

Cancer Risk = Excess risk of an individual developing cancer over a lifetime, or URE (unit risk estimate).

EC = Summa canister time-weighted-average air concentration (eq. 2), or mobile monitoring van average air concentration of the chemical.

IUR = Inhalation Unit Risk estimate (EPA, OEHHA, and TCEQ).

The Inhalation Unit Risk (IUR) estimate for each chemical are the cancer potency factors used for this assessment. An IUR is the increased likelihood of cancer development per unit amount of chemical exposure. For example, if a chemical has an established IUR of 1.0 x 10^{-6} per ppb, then a person is estimated to receive an additional one chance in one million of developing cancer for every increase in 1 ppb of lifetime exposure to that chemical. Thus, a lifetime continuous exposure to 5 ppb of the chemical in air would result in an increased estimate of five chances in one million (above their background cancer risk) that they might develop cancer from that exposure. Likewise, if a chemical has an established IUR of 1.0 x 10^{-4} per ppb, this chemical is considered 100-times more potent a carcinogen than the previous one, and then a person is estimated to take on an additional one chance in one hundred thousand of developing cancer for every increase in 1 ppb of lifetime exposure.

The IURs used for cancer estimates in this risk assessment (and in CDPHE preliminary risk assessments[10]) and their sources, follow:

- Benzene: 7.8 x 10^{-6} per µg/m^3 = 2.5 x 10^{-5} per ppb (USEPA IRIS)
- 1,3-Butadiene: 3.0 x 10^{-5} per µg/m^3 = 6.7 x 10^{-5} per ppb (USEPA IRIS)
- Ethylbenzene: 2.5 x 10^{-6} per µg/m^3 = 1.1 x 10^{-5} per ppb (Cal EPA OEHHA)
- Tetrachloroethane: 2.6 x 10^{-7} per µg/m^3 = 1.7 x 10^{-6} per ppb (USEPA IRIS)
- Isoprene: 2.2 x 10^{-8} per µg/m^3 = 6.1 x 10^{-8} per ppb (TCEQ)

It is important to understand that the conservative nature of IURs should *not* be interpreted as meaning one in 1,000,000 people *will* get cancer if the risk of 1 x 10^{-6} is calculated. According to USEPA, "*Because IURs are typically upper-bound estimates, actual risks may be lower than predicted…, and the true value of the risk is unknown and may be as low as zero. These statistical projections of hypothetical risk are intended as screening tools for risk managers and cannot make realistic predictions of biological effects. Such risk estimates also cannot be used to determine whether someone who already has cancer is ill because of a past exposure*."[11]

[10]CDPHE (2019) Memo: Updated acute and chronic health guideline values for use in preliminary risk assessments (referred to as "FA2019 HGVs"); https://drive.google.com/file/d/1P2KEvu0MFiyzQAOQtjQUclqR-WGh1bEX/view

[11] USEPA (2004). Air Toxics Risk Assessment Reference Library. Volume 1 Technical Reference Library

This risk assessment examined the excess cancer risk for each neighborhood, Summa canister sampling site, and reference site. The variation in chemical levels measured in Summa samples (comparing 1-hour with 1-hour samples and comparing 7-day samples to other 7-day samples) was small across the study period. The mobile monitoring van data set for the ten quarters of the study period consists of thousands of one-hour concentrations of each chemical in each neighborhood. In the original 9-month chronic risk assessment, the exposure metric for the risk calculations was the average of each of the three quarters' maximum 1-hour mobile van averages for each neighborhood. The metric used for the present 30-month risk assessment is the average of each of the ten quarter's 1-hour averages. The reason for the change in exposure metric is because an extra measure of conservatism was warranted for extrapolating three quarters of exposure data to lifetime excess cancer risk. Secondly, with ten quarters and thousands of additional hourly rolling average monitoring van data, using the average of 1-hour averages provides for a more realistic estimate of neighborhood-wide exposure conditions.

3.0 RESULTS

3.1 NON-CANCER RISK

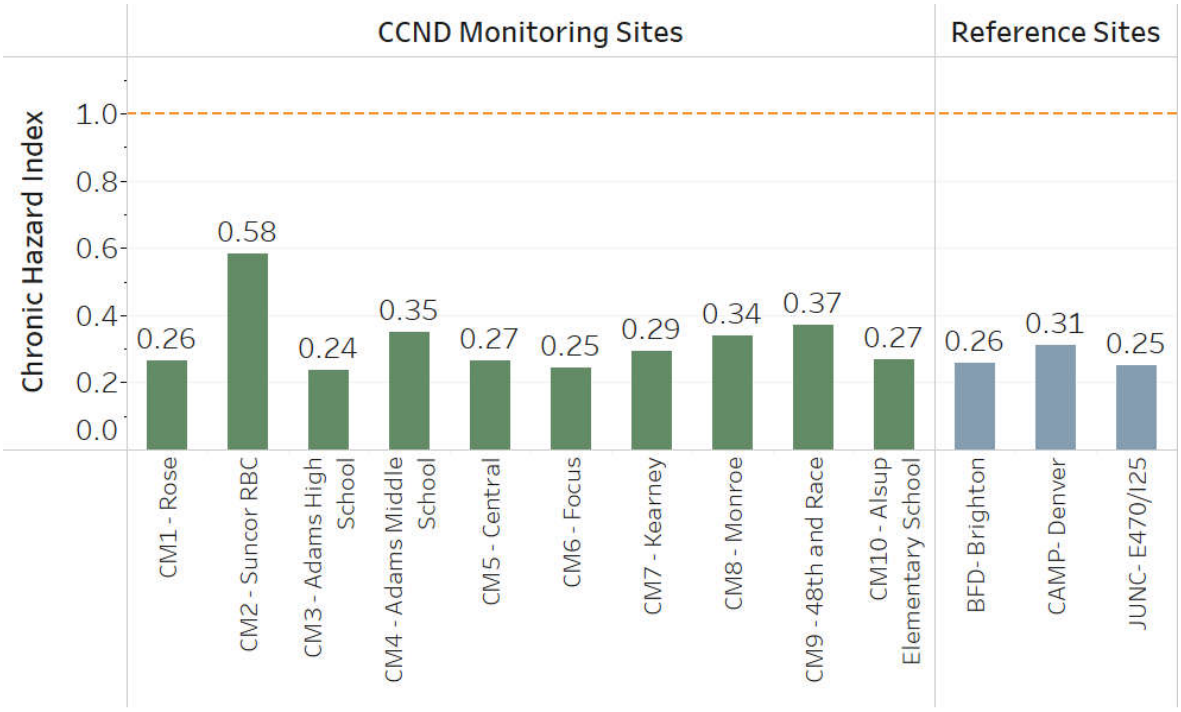
The time-weighted average concentration (Summa canister data) or 1-hour rolling average concentrations (mobile monitoring van data) were calculated from data collected across ten quarters for each neighborhood, sampling locations, and reference sites. These calculated values were compared to chronic RLs to derive chronic HQs for each chemical of interest. To evaluate cumulative risk, the estimated HI values were calculated by adding together the HQs of all detected chemicals measured. According to USEPA guidelines, a chronic HQ or HI less than or equal to one (1) indicates that exposures are likely to be without any chronic non-cancer adverse health effects, even for sensitive sub-populations. Overall, all calculated HQs (Appendix B) and HIs (Table 3-1 and Figures 3-1 and 3-2) in each neighborhood, sampling site and reference site were below one.

TABLE 3-1

Number of Measurements and Chronic Non-Cancer Hazard Indices from Mobile Monitoring Van and Corresponding Summa Canister Sampling sites (Q3 2021 – Q4 2023)

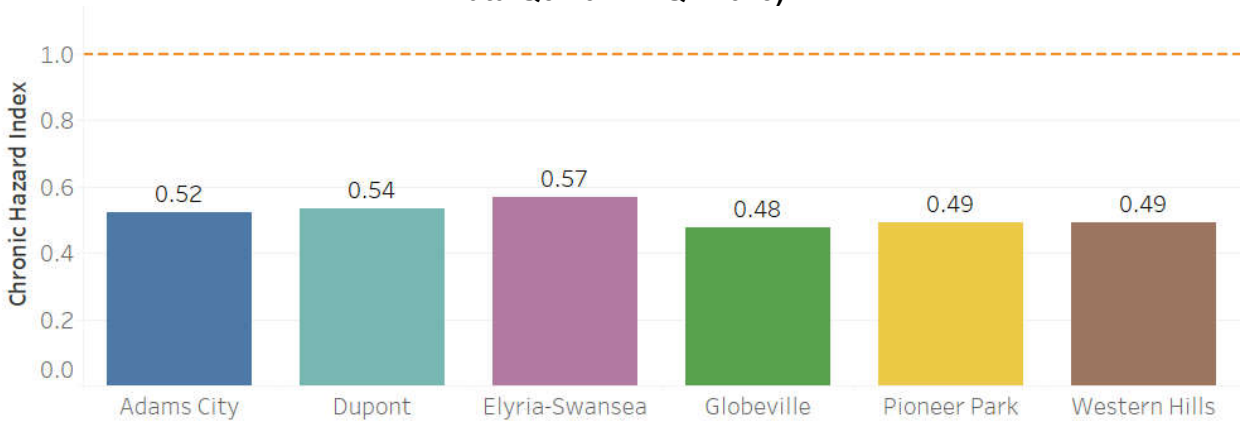
Mobile Van Sampling Neighborhood	No. of mobile van sampling readings (rolling one-hour averages)	Chronic Non-Cancer Hazard Index	CCND Monitoring Sites	Total no. of analytical samples	Chronic Non-Cancer Hazard Index
Adams City	52,578	0.52	**CM-4 Adams Middle School**	20	0.35
			CM-8 Monroe	16	0.34
			CM-10 Alsup	16	0.27
Dupont	85,345	0.54	**CM-3 Adams High School**	23	0.24
Pioneer Park	99,033	0.49	**CM-1 Rose**	20	0.26
			CM-5 Central	19	0.27
			CM-7 Kearney	18	0.29
Elyria-Swansea	44,583	0.57	**CM-2 Suncor RBC**	18	0.58
			CM-6 Focus	16	0.25
			CM-9- 48th and Race	17	0.37
Globeville	42,558	0.48	-	-	-
Western Hills	81,702	0.49	-	-	-

FIGURE 3-1
Chronic Non-Cancer Hazard Indices for CCND Sampling Locations and Reference Sampling Locations (Summa Canisters Q3 2021 – Q4 2023)



Hazard Index (HI) is the sum of all combined hazard quotients (HQ). According to EPA, a HI less than or equal to one (orange line) indicates that exposures are likely to be without any appreciable risk of adverse health effects, even for sensitive sub-populations.

FIGURE 3-2
Chronic Non-Cancer Hazard Indices for CCND Neighborhoods (Mobile Monitoring Van Data Q3 2021 – Q4 2023)



Hazard Index (HI) is the sum of all combined hazard quotients (HQ). According to EA, a HI less than or equal to one (orange line) indicates that exposures are likely to be without any appreciable risk of adverse health effects, even for sensitive sub-populations.

3.2 CANCER RISK

Cancer risks were estimated for five chemicals which have IUR values available. The total (cumulative) cancer risks were calculated by adding together the chemical-specific risks for each neighborhood or reference site. The results of these calculations are shown in Tables 3-2 and 3-3 and in Figure 3-3.

TABLE 3-2
Chemical-Specific and Total Cancer Risk Estimates by Sampling Site from Summa Canister Data

Cancer Risk Estimates							
Location		**1,3-Butadiene IUR: $6.7x10^{-5}$**	**Benzene IUR: $2.5x10^{-5}$**	**Ethylbenzene IUR: $1.1x10^{-5}$**	**Isoprene IUR: $6.1x10^{-8}$**	**Tetrachloro-ethene IUR: $1.7x10^{-6}$**	**Total Risk Estimate**
CCND Sampling Sites	**CM1 – Rose**	2.7E-06	4.2E-06	7.9E-07	2.2E-09	7.6E-08	7.7E-06
	CM2 – RBC	8.5E-06	1.2E-05	1.7E-06	2.0E-09	2.0E-07	2.3E-05
	CM3 – Adams High School	1.7E-06	4.1E-06	6.3E-07	2.5E-09	4.5E-08	6.5E-06
	CM4 – Adams Middle School	5.1E-06	6.4E-06	1.0E-06	2.0E-09	9.8E-08	1.3E-05
	CM5 – Central	3.6E-06	4.6E-06	8.1E-07	2.0E-09	6.5E-08	9.1E-06
	CM6 – Focus	2.7E-06	4.6E-06	9.2E-07	3.2E-09	4.3E-08	8.2E-06
	CM7 – Kearney	3.4E-06	4.8E-06	8.4E-07	1.6E-09	6.5E-08	9.0E-06
	CM8 – Monroe	3.8E-06	6.5E-06	8.1E-07	1.6E-09	7.5E-08	1.1E-05
	CM9- 48th and Race	3.8E-06	6.0E-06	1.7E-06	1.8E-09	7.2E-08	1.2E-05
	CM10- Alsup Elementary	3.3E-06	5.4E-06	1.0E-06	3.2E-09	6.4E-08	9.8E-06
Reference Sites	**BFD- Brighton**	2.8E-06	4.0E-06	5.7E-07	1.8E-09	6.3E-08	7.5E-06
	CAMP- Denver	3.9E-06	7.7E-06	7.7E-07	2.0E-09	5.8E-08	1.2E-05
	JUNC- E470/I25	3.2E-06	3.9E-06	6.6E-07	1.6E-09	5.8E-08	7.8E-06

Inhalation unit risk (IUR) value is converted to per ppb. One significant figure is displayed for consistency with EPA's reporting of IUR's.

TABLE 3-3
Chemical-Specific and Total Cancer Risk Estimates by Neighborhood from Mobile Monitoring Van Data

Cancer Risk Estimates						
CCND Neighborhood	**1,3 Butadiene IUR: $6.7x10^{-5}$**	**Benzene IUR: $2.5x10^{-5}$**	**Ethylbenzene* IUR: $1.1x10^{-5}$**	**Isoprene IUR: $6.1x10^{-8}$**	**Tetrachloroethene IUR: $1.7x10^{-6}$**	**Total Risk Estimate**
Adams City	1.7E-06	6.9E-06	1.0E-05	1.5E-08	1.5E-08	**1.9E-05**
Dupont	1.8E-06	6.2E-06	5.5E-06	1.0E-08	1.0E-08	**1.4E-05**
Elyria-Swansea	2.5E-06	6.7E-06	9.4E-06	1.3E-08	2.5E-08	**1.9E-05**
Globeville	2.1E-06	7.6E-06	9.3E-06	1.4E-08	1.3E-08	**1.9E-05**
Pioneer Park	2.1E-06	5.1E-06	6.9E-06	1.2E-08	1.5E-08	**1.4E-05**
Western Hills	2.0E-06	6.1E-06	9.2E-06	1.3E-08	2.0E-08	**1.7E-05**

Inhalation unit risk (IUR) value is converted to per ppb. One significant figure is displayed for consistency with EPA's reporting of IUR's.
*Risk estimates may include multiple isomer groups (ethylbenzene and xylenes) since they are unable to be differentiated in this analysis.

It is helpful to understand the cancer risks calculated in this report in the context of typical background cancer risks in the United States (U.S.) For federal regulatory agencies in the U.S., a 10^{-4} excess cancer risk level is the upper end of the generally acceptable risk range of 10^{-6} (one in 1,000,000 excess cancers) to 10^{-4} (one in 10,000 excess cancers) above background, as discussed in the National Contingency Plan (NCP), 40 CFR 300.430[12]. Those values may be compared with the average lifetime likelihood of developing cancer for any reason (environmental

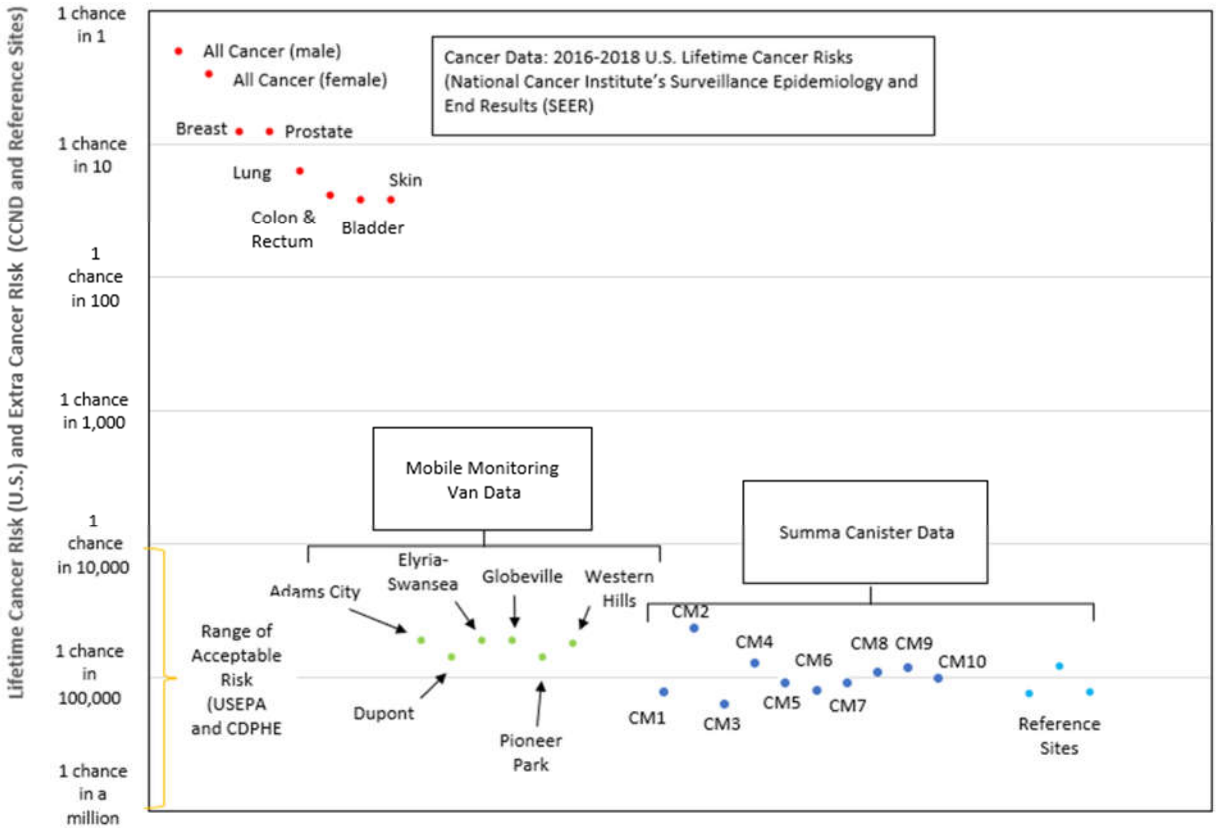
[12] 40 CFR Ch. I (7–1–11 Edition) § 300.430. https://www.govinfo.gov/content/pkg/CFR-2011-title40-vol28/pdf/CFR-2011-title40-vol28-sec300-430.pdf

factors, genetic heredity, lifestyle choices, etc.). According to data from the National Cancer Institute's Surveillance Epidemiology and End Results (SEER) database from 2016 through 2018, the estimated lifetime likelihood of a person living in the U.S. developing cancer is one in two for men and one in three for women[13]. Thus, an additional one in 10,000 to one in 1,000,000 cancer risk does not add appreciable risk to an individual's overall chance of developing cancer over a lifetime.

The total excess cancer risks from the chemicals measured in the different CCND neighborhoods/ sampling sites are within the EPA acceptable risk range and similar to the reference sites (Table 3-2 and Figure 3-3). Based on these data, lifetime cancer risks are similar between the CCND and reference sites.

FIGURE 3-3

Comparison of Lifetime Cancer Risks in the U.S. with Estimated Excess Cancer Risk Based on 30 Months of CCND Air Program Data



[13] https://www.cancer.org/healthy/cancer-causes/general-info/lifetime-probability-of-developing-or-dying-from-cancer.html

4.0 UNCERTAINTY EVALUATION

Scientific uncertainty is inherent in each step of the risk assessment process because all risk assessments incorporate a variety of assumptions and professional judgments. Therefore, the hazard estimates presented in this assessment are estimates of risk due to several assumptions about exposure and toxicity. This screening-level risk assessment relied on a combination of health-protective exposure scenarios and input values (i.e., lifetime exposure estimates, assumed similar toxic effect from all chemicals measured). Because of these assumptions, the estimates of chronic non-cancer hazards and cancer risks are themselves uncertain but likely to over-estimate actual risk.

The chronic non-cancer and cancer risk assessments for the 30-month period are based on data collected on specific dates using the Summa canister and mobile monitoring van platforms. This assumes that the samples collected over a 30-month period represent estimated EC that a person that would breathe continuously over a lifetime (24 hours a day, 7 days a week).

In addition, risks calculated from the mobile monitoring van data have some level of uncertainty because the van's instrumentation does not differentiate some of the detected isomers (see Appendix A). For the sake of simplicity, the concentration and HQ values shown in Appendix B refer to generic names for a group of specific isomers. Risks from the isomer groups are calculated based on health RL for the isomer representing the isomer group, which may conservatively overestimate risk from exposure to the isomer group. This is of particular importance for cancer risk estimates for ethylbenzene. The PTR-ToF-MS in the van used to measure ethylbenzene cannot distinguish it from the three isomers of xylene due to structural similarities. Any measurement of xylenes may be comprised of all xylenes, all ethylbenzene, or some combination of the two. The Summa canister data consistently show total xylene levels to be higher than ethylbenzene. Thus, without a suitable method to separate ethylbenzene from the mobile monitoring van's xylenes measurements, the conservative assumption is that these measurements are completely ethylbenzene. This instrument limitation overestimates the cancer risk from ethylbenzene exposure.

The inclusion of concentration values for non-detected chemicals in Summa canister samples introduces some level of uncertainty into the estimated EC. For CCND acute risk assessments, non-detection measurements are conservatively treated by using the laboratory's method detection limit (MDL: the lowest concentration that an instrument may reliably identify a chemical) as a surrogate concentration, assuming that the chemical did, in fact, exist in the sampled air at just below the MDL concentration. However, for chronic risk assessment, the use of a chemical's MDL for all the non-detected chemicals may disproportionately add uncertainty because of time-weighted averaging of numerous samples over a long period of time that have non-detects. To balance additional uncertainty with adequate public health protection, non-detected chemicals in the chronic risk assessment are represented in the EC_{TWA} as one-half of the MDL. This choice represents the fact that there is as much likelihood that the chemical is not present at all (actually zero) as there is that the chemical is in the sample at just under the MDL. The use of ½ MDL as a surrogate concentration is recommended by USEPA.[14]

[14] USEPA Data Quality Assessment: Statistical Methods for Practitioners https://www.epa.gov/sites/default/files/2015-08/documents/g9s-final.pdf

Additional uncertainty related to health-based reference levels or carcinogen inhalation unit risk values is also present. For many analytes, these values are derived from a limited set of data and are derived using a variety of assumptions, such as information from animal studies, extrapolations from experimental high-doses to low-doses, or data from other similar chemicals. However, all derivations ensure a margin of safety and as such, are intentionally conservative.

This risk assessment did not address past or present health outcomes associated with current or past exposures. As such, this risk assessment cannot be used to make realistic predictions of biological effects and/or used to determine whether someone is ill (cancer or other adverse health effects) due to past or current exposures.

This risk assessment was limited to inhalation exposures from outdoor exposures to all potential sources.

5.0 CONCLUSIONS

In conclusion, the data collected during this ten quarter study phase did not indicate a potential for chronic non-cancer adverse health effects from exposure to the measured chemicals, both individually and cumulative. The result of all HQ and HI calculations falling below one (1) indicates the lack of potential adverse chronic non-cancer health effects, even for sensitive sub-populations. These conclusions were drawn from two different types of data collection platforms (Summa canister sampling and mobile monitoring van sampling).

Cancer risks for individual and combined chemicals were below EPA's upper acceptable cancer risk range and were similar to risk estimates from measurements at reference sites, suggesting similar cancer risks for an individual spending an entire lifetime in a CCND neighborhood or one of the reference sites outside of the CCND neighborhoods.

Further, the chemical-specific and total (cumulative) estimates of lifetime excess cancer risk from exposure to the five potential carcinogens that were measured in the CCND neighborhoods, sampling locations and reference sites all fell between the range of 1 in 10,000 to 1 in a million chances of developing cancer above background risks, which is typically one in two for men and one in three for women in the U.S.

Respectfully Submitted:

Michael Lumpkin, PhD, DABT
Senior Toxicologist
CTEH, LLC

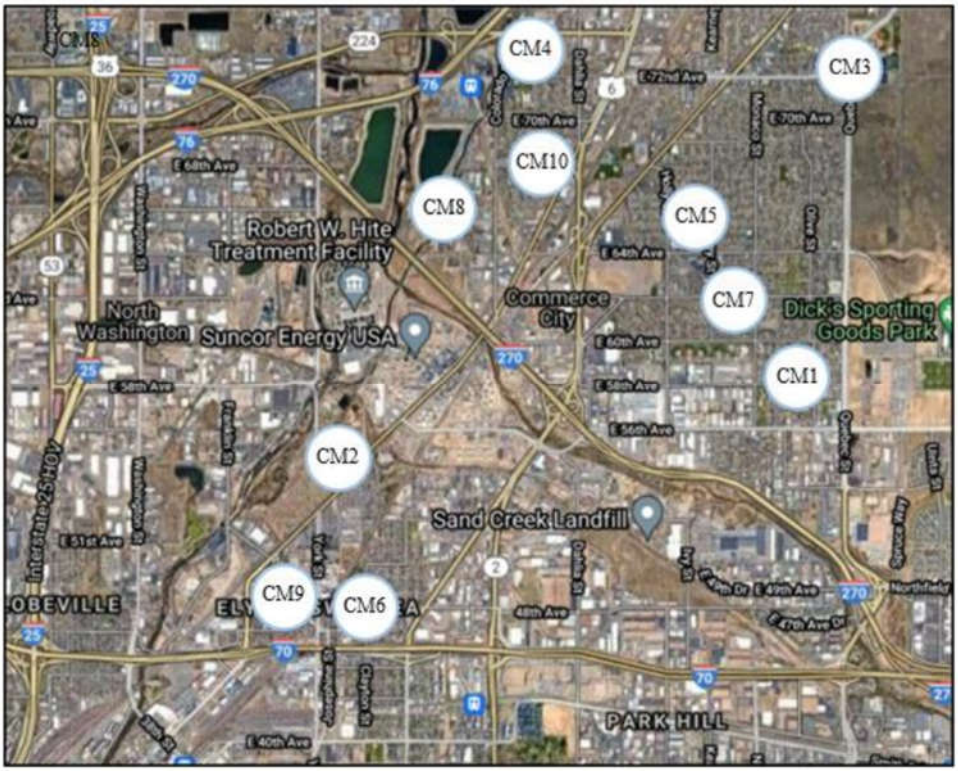
Appendix A – Air Monitoring Collection Method Details

Summa Canister Collection Methods

Ten monitors and Summa canister sampling locations were positioned throughout the Commerce City and North Denver (CCND) neighborhoods, within a three-mile radius of the refinery operations. The monitor locations are shown in Figures A-1 and A-2 and described in Table 1; they were selected based on the following criteria:

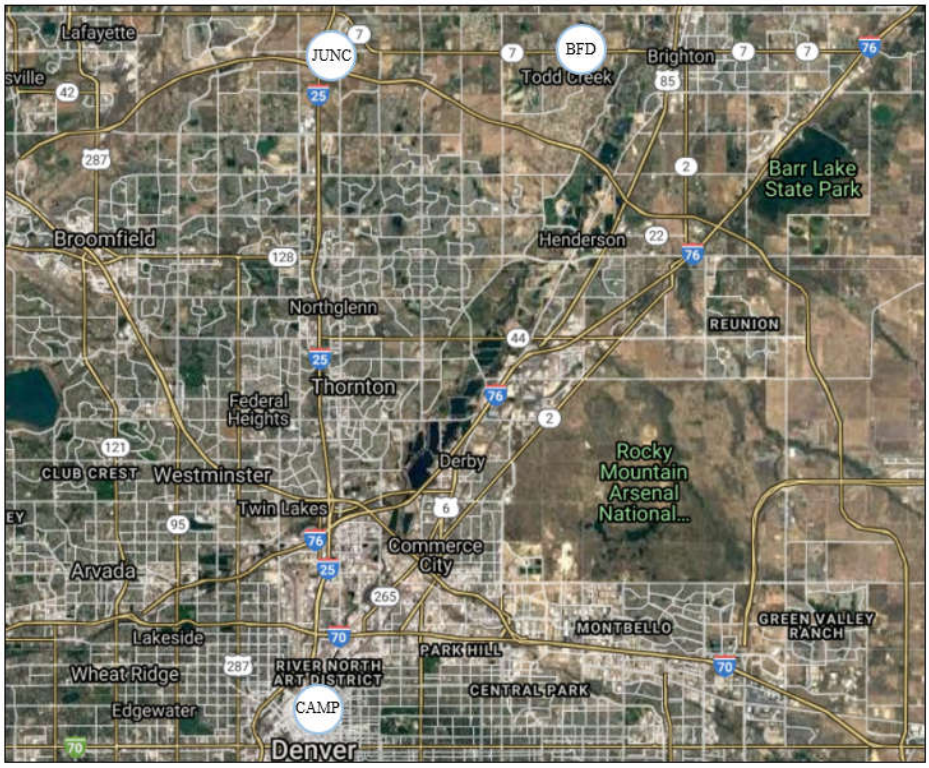
- Historical wind pattern data,
- Proximity to the refinery and non-refinery sources,
- Existing infrastructure, as well as site access and safety,
- Community feedback

FIGURE A-1
MAP OF TEN CCND MONITOR LOCATIONS



Additional planned air samples were collected at non-CCND community sampling sites (reference locations), in both urban and rural locations (Table A-2). These locations were at the E470-I25 Junction (JUNC), the Brighton Fire Department (BFD), and the Colorado Department of Health and Environment (CDPHE) CAMP air monitoring station (CAMP). The JUNC and BFD monitoring locations were chosen as rural background locations about 13 miles north of the CCND network. The CAMP location was selected as a representative urban location that has comparative data collected by CDPHE[15].

FIGURE A-2
MAP OF THREE NON-CCND COMMUNITY MONITORING (URBAN AND RURAL BACKGROUND) SITES: E470/I25 (JUNC), BRIGHTON FIRE DEPARTMENT (BFD) AND COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE) CAMP AIR MONITORING STATION (CAMP)



[15] CDPHE describes CAMP as Urban in many reports. As an example, this description can be found on page 6 of the 2020 Ambient Air Monitoring Network Assessment: https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2020_CO_5yr_Network_Assessment.pdf

TABLE A-1
CCND MONITORS AND SUMMA CANISTER SAMPLING LOCATIONS

Location ID	Secondary ID	GPS Coordinates	Distance from Refinery Center (miles)	Cross Streets
CM1	Rose Hill Elementary School	39.80164, -104.90882	2.0	E. 58th Ave. & Oneida St., Commerce City
CM2	Suncor Refinery Business Center	39.79619, -104.95732	0.70	Brighton Blvd. & York St., Commerce City
CM3	Adams City High School	39.82736, -104.90193	2.9	E. 72nd Ave. & Quebec Pkwy, Commerce City
CM4	Adams City Middle School	39.82893, -104.93499	1.9	Birch St. & E. 72nd Ave., Commerce City
CM5	Central Elementary School	39.81457, -104.91928	1.7	Holly St. & E 64th Ave., Commerce City
CM6	Focus Points Family Resource Center	39.78436, -104.95663	1.4	Columbine St. & 48th Ave., Denver
CM7	Kearney Middle School	39.80888, -104.91545	1.7	E. 62nd Ave. & Kearney St., Commerce City
CM8	Monroe	39.81560, -104.94503	0.85	Monroe St. & E. 64th Ave., Denver
CM9	48th and Race	39.78455, -104.96264	1.7	East 48th Ave. & Race St., Denver
CM10	Alsup Elementary School	39.82026, -104.93663	1.3	East 68th Ave. & Birch St., Commerce City

TABLE A-2
SUMMA CANISTER REFERENCE LOCATIONS

Location ID	Secondary ID	GPS Coordinates	Distance from Refinery Center (miles)	Cross Streets
CAMP	Denver CDPHE	39.75111, -104.98766	4.2	Champa St. & N. Broadway, Denver
JUNC	E470/I25	39.98614, -104.98468	12.8	E. 160th & Washington St., Thornton
BFD	Brighton	39.98512, -104.86665	13.1	Havana St. & Havana Way, Brighton

Entech Instruments Silonite™ CS1200E Passive Canister Samplers connected to six-liter chemically inert stainless steel ("Summa" canisters) were used to collect samples over a one-hour period. The Summa canisters were cleaned and blanked for use according to laboratory standard operating procedures. Planned air samples were collected by a field technician by manually opening and closing the Summa canister's regulator valve during a time when real-time instruments indicated total VOC concentrations to be less than the 1-ppm trigger level. VOC sensor-triggered samples were collected automatically by the CCND Lunar Outpost Canary-S VOC monitor paired with an ACE Summa canister triggering system. The VOC sensor-triggered samples are collected if the VOC monitor detected one (1) part per million (ppm) of total VOCs during a one-minute period. All sampling and quality assurance procedures were performed by Montrose. All Summa canister field sampling followed the Standard Operating Procedure (SOP) provided in the QAPP.

The canister samples were shipped to Enthalpy Analytical in Durham, North Carolina. The United States Environmental Protection Agency (USEPA) Compendium Method TO-14A "*Determination of Volatile Organic Compounds (VOCs) in Ambient Air using Specially Prepared Canisters with Subsequent Analysis by Gas Chromatography*" and TO-15 entitled "*Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)*" was followed for both sampling and analysis methodology. A total of 59 compounds were selected for analysis in this assessment and was based on the typical set of compounds monitored for in urban and industrial areas, and accounting for laboratory analysis capabilities (Table A-3).

TABLE A-3
SELECTED COMPOUNDS MEASURED IN SUMMA CANISTERS

Ethylene	Isopentane	3-Methylpentane	3-Methylheptane	2,4-Dimethylpentane
Acetylene	1-Pentene	1-Hexene	Nonane	2,3-Dimethylpentane
Ethane	Pentane	1,3-Butadiene	3-Ethyltoluene	1,2,3-Trimethylbenzene
Propylene	Isoprene	Heptane	2-Ethyltoluene	1,3,5-Trimethylbenzene
Propane	Trans-2-Pentene	2-Methylhexane	Decane	2,2,4-Trimethylpentane
Isobutane	Cis-2-Pentene	Toluene	Ethylbenzene	Tetrachloroethene
1-Butene	2,2-Dimethylbutane	3-Methylhexane	m-Diethylbenzene	1,2,4-Trimethylbenzene
Butane	Cyclopentane	Methylcyclohexane	p-Diethylbenzene	Methylcyclopentane
Trans-2-Butene	Cyclohexane	Hexane	Undecane	2,3,4-Trimethylpentane
Cis-2-Butene	2-Methylpentane	2-Methylheptane	Dodecane	2,3-Dimethylbutane
m-/p-Xylenes	o-Xylene	4-Ethyltoluene	Benzene	Carbon disulfide
n-Octane	Isopropylbenzene	n-Propylbenzene	Naphthalene	

Mobile Van Sampling Methods

The mobile monitoring van is a Mercedes 2500 Sprinter Van outfitted with equipment necessary to identify and quantitate individual chemicals present in ambient air to ultra-low concentrations. The mobile monitoring van is equipped with an Ionicon Model 6000-X2 proton transfer reaction time-of-flight mass spectrometer (PTR-TOF-MS). This instrument provides concentrations of select chemicals at sub-parts per billion (ppb) levels and as quickly as one measurement per second. The mobile monitoring van is outfitted with an external sampling system, which transports ambient air from outside of the van into the PTR-TOF-MS sample inlet for immediate real-time analysis. The entire sampling system is comprised of Teflon or Teflon-coated materials, which ensures the lowest amount of sample loss due to surface absorption of chemical molecules. The mobile monitoring van incorporates a high-precision global positioning system (GPS), a sonic anemometer to measure wind direction and wind velocity and a multitude of other incorporated meteorological (MET) sensors.

During the mobile monitoring program, groups of chemical isomers (Table A-5) that include the list of 65 chemicals in Table A-4 were measured to determine the instantaneous ambient concentrations. This list of chemicals was compiled based on the typical chemicals that are monitored in urban and industrial areas, and the mobile monitoring van analysis capabilities.

The mobile monitoring van followed a driving route through each of the six CCND residential neighborhoods that fall within a three-mile radius around the refinery operations. Accessible streets in the neighborhoods were traversed at approximately 10 MPH while collecting a data point every one second.

TABLE A-4
MOBILE MONITORING VAN PROGRAM CHEMICALS

Propane	2-Methylhexane	Ethane	Methyl-cyclopentane	o-Ethyltoluene (2-ethyltoluene)
1,3-Butadiene	2-Methylpentane	Ethylbenzene	m-Ethyltoluene	p-Diethylbenzene (1,4-diethylbenzene)
1-Butene	3-Methylheptane	Ethylcyclohexane	m/o/p-Xylenes	p-Ethyltoluene (4-ethyltoluene)
1-Hexene	3-Methylhexane	Ethylene	n-Butane	1,2,4-trimethylbenzene
1-Pentene	3-Methylpentane	Hydrogen Cyanide	n-Decane	Propylene (Propene)
Styrene	Acetylene	Hydrogen Sulfide	n-Dodecane	2,2,4-Trimethylpentane
2,2-Dimethylbutane	Benzene	i-Butane	n-Heptane	Tetrachloroethylene
Toluene	Carbon disulfide	i-Pentane	n-Hexane	2,3,4-Trimethylpentane
2,3-Dimethylbutane	trans-2-Butene	Isopentane	n-Nonane	trans-1,2-Dimethylcyclohexane
2,3-Dimethylpentane	cis-2-Butene	Isoprene	n-Octane	trans-1,3-Dimethylcyclohexane
2,4-Dimethylpentane	cis-2-Pentene	m-Diethylbenzene	n-Pentane	cis-1,3-dimethylcyclohexane
2-Methyl-2-butene	Cumene	Methanol	n-Propylbenzene	trans-2-Pentene
2-Methylheptane	Cyclohexane	Methyl-cyclohexane	n-Undecane	Cyclopentane

In a real-time PTR-TOF analysis, it is not possible to speciate isomers, or chemical compounds that have the same molecular weight. For example, n-hexane, 2-methyl pentane, and 2,2-dimethyl butane all have a molecular mass of 86.178 g/mol. To provide the most conservative determination of concentration during this mapping program, each isomer's concentration is reported as the sum of all isomers with the same molecular weight. For the sake of simplicity, the calculations in the report refer to generic names for a group of specific isomers. The following table defines which isomers comprise each generic group. For risk assessment calculations, risks from the isomer groups are calculated based on health RL for the isomer representing the isomer group, which may conservatively overestimate risk from exposure to the isomer group.

Table A-5
MOBILE MONITORING VAN PROGRAM CHEMICAL GROUP

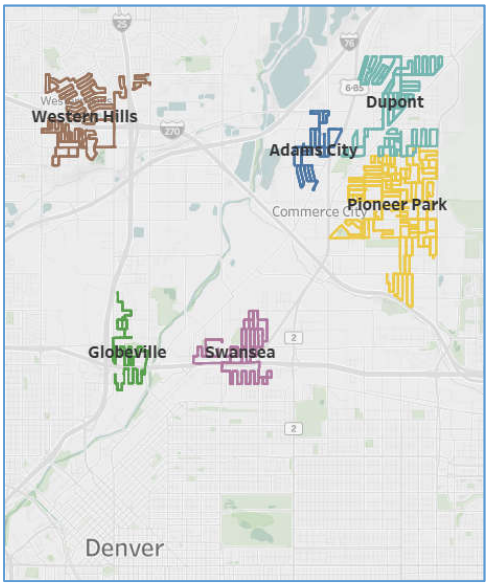
Group Name	Specific Isomers
Butenes	1-Butene
	cis-2-Butene
	trans-2-Butene
Butanes	iso-Butane
	n-Butane
Pentenes	1-Pentene
	2-Methyl-2-butene
	cis-2-Pentene
	trans-2-Pentene
Pentanes	iso-Pentane
	n-Pentane
	neo-Pentane
Hexenes	1-Hexene
	Cyclohexane
	Methylcyclopentane
Hexanes	n-Hexane
	2-Methylpentane
	3-Methylpentane
	2,2-Dimethylbutane
	2,3-Dimethylbutane
Heptanes	n-Heptane
	2-Methylhexane
	3-Methylhexane
	2,3-Dimethylpentane
	2,4-Dimethylpentane
Xylenes	Ethyl Benzene
	o-Xylene
	m-Xylene
	p-Xylene
Dimethylcyclohexanes	Ethylcyclohexane
	cis-1,3-Dimethylcyclohexane
	trans-1,2-Dimethylcyclohexane
	trans-1,3-Dimethylcyclohexane
Octanes	n-Octane
	2-Methylheptane
	3-Methylheptane
	2,2,4-Trimethylpentane
	2,3,4-Trimethylpentane
Trimethylbenzenes	Cumene
	1,2,4-Trimethylbenzene
	o-Ethyltoluene
	m-Ethyltoluene
	p-Ethyltoluene
	n-Propylbenzene
Diethylbenzenes	o-Diethylbenzene
	m-Diethylbenzene
	p-Diethylbenzene

The PTR-TOF-MS calibration was checked and the instrument was zeroed each day prior to collection of any ambient air data. The instrument was calibrated using United States Environmental Protection Agency (USEPA) protocol certified calibration gases. The multi-chemical cylinder standards were used to generate multiple point calibration curves for each commercially available chemical present in the standard. Note: Not all chemicals listed in Table 2-1 are available as certified calibration gases. The chemical dilutions were made using an Environics Model 4040 gas dilution system. The gas dilution system was validated using the appropriate USEPA methodology (40 Code of Federal Regulation Part 51 Appendix M, Method 205). Zero-count measurements were obtained to ensure proper baseline measurements were incorporated into the calculation of each chemical's concentration. Zero-count measurements were performed through the entire sampling system using ultra-high purity air. Post-testing calibration checks were performed on the instrument to ensure there was no significant drift during the course of the sampling event. Drift can cause an increase or decrease in the measured chemical concentrations, which can lead to both positive and negative biasing of the obtained results.

The mobile monitoring van collected continuous measurements throughout each neighborhood following the routes shown in Figure A-3. Measurements that were collected from transition periods or from moving between neighborhoods were excluded in this assessment.

The measurements were collected from the ambient environment at a height of 15 feet above grade at approximately 8 liters per minute using a Teflon-coated sampling boom and pump. The PTR-TOF-MS sampled a slip stream of this flow at approximately 100 ml/min. The sample was introduced into the reaction tube of the PTR-TOF-MS, and results were collected in 1-second intervals. Specific PTR-TOF-MS instrument operation conditions are available on the CCND website.

FIGURE A-3
MOBILE MONITORING VAN PROGRAM ROUTE THROUGH SIX NEIGHBORHOOD AREAS



Appendix B

Chronic Hazard Quotients for Individual Chemicals from Summa Canister by Location

Summa Canister Data Summary and Risk Assessment

CM1 - Rose | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	20	12	5.7595	0.325	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	20	1	0.1320	0.0253	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	20	6	0.3090	0.0266	560	TCEQ Long-Term AMCV	0.0000
1,2,3-Trimethylbenzene	526-73-8	20	8	1.0100	0.0485	12	EPA Inhalation RfCi	0.0040
1,2,4-Trimethylbenzene	95-63-6	20	13	2.9000	0.0667	12	EPA Inhalation RfCi	0.0055
1,3-Butadiene	106-99-0	20	10	0.2240	0.0399	0.95	EPA RSL Non-Cancer	0.0420
1,3-Diethylbenzene	141-93-5	20	4	0.1100	0.0686	45	TCEQ Long-Term AMCV	0.0015
1,3,5-Trimethylbenzene	108-67-8	20	5	0.8910	0.0339	12	EPA Inhalation RfCi	0.0028
1,4-Diethylbenzene	105-05-5	20	7	0.9040	0.0516	45	TCEQ Long-Term AMCV	0.0011
2-Ethyltoluene	611-14-3	20	2	0.3690	0.0256	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	20	6	0.4670	0.0329	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	20	12	0.9450	0.0559	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	20	19	2.6100	0.2466	190	TCEQ Long-Term AMCV	0.0013
2,2-Dimethylbutane	75-83-2	20	4	0.6200	0.0267	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	20	13	0.4790	0.0965	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	20	9	0.6870	0.0816	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	20	13	0.4760	0.0505	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	20	3	0.1940	0.0258	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	20	11	0.4380	0.0589	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	20	7	0.8950	0.0447	25	TCEQ Long-Term AMCV	0.0018
3-Methylheptane	589-81-1	20	6	0.4130	0.0399	380	TCEQ Long-Term AMCV	0.0001
3-Methylhexane	589-34-4	20	15	1.0200	0.1926	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	20	18	2.0400	0.1597	190	TCEQ Long-Term AMCV	0.0008
4-Ethyltoluene	622-96-8	20	4	0.3300	0.0382	25	TCEQ Long-Term AMCV	0.0015
Acetylene	74-86-2	20	20	3.5200	0.6744	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	20	19	0.9960	0.1674	3	ATSDR Chronic MRL	0.0558
Butane	106-97-8	20	20	27.6000	1.804	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	20	8	0.3030	0.0802	225	EPA Inhalation RfCi	0.0004
Cis-2-Butene	590-18-1	20	6	0.2090	0.0325	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	20	3	0.3090	0.0251	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	20	17	1.0000	0.0792	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	20	11	0.5072	0.0425	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	20	9	0.5830	0.0489	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	20	9	108.0000	0.1927	3.8	CDPHE Chronic	0.0507
Ethane	74-84-0	20	20	21.8000	7.7909	NA	NA	
Ethylbenzene	100-41-4	20	16	1.5600	0.0724	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	20	20	4.4100	1.1522	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	20	18	0.8180	0.1101	98	EPA Inhalation RfCi	0.0011
Hexane	110-54-3	20	20	1.6000	0.2324	199	EPA Inhalation RfCi	0.0012
Isobutane	75-28-5	20	20	6.0100	0.7027	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	20	19	7.4500	1.0909	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	20	6	7.8359	0.0357	140	TCEQ Long-Term AMCV	0.0003
Isopropylbenzene	98-82-8	20	4	0.1970	0.0288	81	EPA Inhalation RfCi	0.0004
m,p-Xylenes	108-38-3 &/..	20	20	6.6000	0.1816	23	EPA RSL Non-Cancer	0.0079
Methylcyclohexane	108-87-2	20	12	0.7860	0.0749	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	20	14	1.6300	0.1851	75	TCEQ Long-Term AMCV	0.0025
n-Octane	111-65-9	20	10	0.7280	0.0407	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	20	1	2.4000	0.0314	0.57	EPA Inhalation RfCi	0.0549
Nonane	111-84-2	20	4	2.0200	0.0281	3.8	EPA Inhalation RfCi	0.0074
o-Xylene	95-47-6	20	16	2.1400	0.0822	23	EPA RSL Non-Cancer	0.0036
Pentane	109-66-0	20	20	6.7868	0.8314	338	EPA Inhalation RfCi	0.0025
Propane	74-98-6	20	20	51.9000	3.2621	NA	NA	
Propylbenzene	103-65-1	20	4	0.2990	0.0349	203	EPA Inhalation RfCi	0.0002
Propylene	115-07-1	20	20	1.0500	0.2477	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	20	7	0.3700	0.0437	5.9	EPA Inhalation RfCi	0.0074
Toluene	108-88-3	20	20	5.1200	0.469	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	20	4	0.3460	0.0327	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	20	7	0.6580	0.0293	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	20	12	6.5900	0.0597	55	TCEQ Long-Term AMCV	0.0011
							Hazard Index	**0.2649**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

CM2 - Suncor RBC | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	18	12	0.2580	0.0738	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	18	1	0.5274	0.0252	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	18	10	0.7727	0.0495	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	18	9	0.1011	0.0495	12	EPA Inhalation RfCi	0.0041
1,2,4-Trimethylbenzene	95-63-6	18	13	0.5200	0.1648	12	EPA Inhalation RfCi	0.0135
1,3-Butadiene	106-99-0	18	8	0.4100	0.127	0.95	EPA RSL Non-Cancer	0.1338
1,3-Diethylbenzene	141-93-5	18	4	0.0940	0.0525	45	TCEQ Long-Term AMCV	0.0012
1,3,5-Trimethylbenzene	108-67-8	18	4	0.3800	0.103	12	EPA Inhalation RfCi	0.0084
1,4-Diethylbenzene	105-05-5	18	9	0.0991	0.0656	45	TCEQ Long-Term AMCV	0.0015
2-Ethyltoluene	611-14-3	18	2	0.2100	0.0246	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	18	4	0.0920	0.0251	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	18	12	0.2400	0.1222	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	18	17	12.2428	0.3275	190	TCEQ Long-Term AMCV	0.0017
2,2-Dimethylbutane	75-83-2	18	7	2.2430	0.0281	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	18	13	9.3200	0.1859	380	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylbutane	79-29-8	18	9	5.8296	0.098	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	18	11	2.1288	0.0727	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	18	3	0.2590	0.0334	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	18	8	0.3900	0.0738	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	18	7	0.3100	0.044	25	TCEQ Long-Term AMCV	0.0018
3-Methylheptane	589-81-1	18	8	0.4400	0.1328	380	TCEQ Long-Term AMCV	0.0003
3-Methylhexane	589-34-4	18	15	0.4900	0.2698	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	18	17	7.2120	0.2519	190	TCEQ Long-Term AMCV	0.0013
4-Ethyltoluene	622-96-8	18	4	0.3500	0.1014	25	TCEQ Long-Term AMCV	0.0041
Acetylene	74-86-2	18	18	2.2800	0.6206	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	18	17	2.2000	0.4862	3	ATSDR Chronic MRL	0.1621
Butane	106-97-8	18	18	26.7503	2.8024	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	18	9	0.4900	0.1751	225	EPA Inhalation RfCi	0.0008
Cis-2-Butene	590-18-1	18	6	0.8368	0.0445	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	18	3	1.4242	0.0257	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	18	13	11.1000	0.1935	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	18	14	2.2843	0.1281	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	18	13	0.1101	0.0739	190	TCEQ Long-Term AMCV	0.0004
Dodecane	112-40-3	18	10	0.1978	0.1393	3.8	CDPHE Chronic	0.0367
Ethane	74-84-0	18	18	21.0000	8.3043	NA	NA	
Ethylbenzene	100-41-4	18	12	0.5280	0.1574	230	EPA Inhalation RfCi	0.0007
Ethylene	74-85-1	18	18	3.0500	1.0848	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	18	17	2.2600	0.2398	98	EPA Inhalation RfCi	0.0025
Hexane	110-54-3	18	18	9.0500	0.4799	199	EPA Inhalation RfCi	0.0024
Isobutane	75-28-5	18	18	4.7847	1.028	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	18	18	97.2967	1.7342	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	18	5	0.2506	0.0328	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	18	4	0.3500	0.098	81	EPA Inhalation RfCi	0.0012
m,p-Xylenes	108-38-3 &/..	18	16	1.8500	0.3787	23	EPA RSL Non-Cancer	0.0165
Methylcyclohexane	108-87-2	18	11	0.1760	0.0983	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	18	14	0.3950	0.2166	75	TCEQ Long-Term AMCV	0.0029
n-Octane	111-65-9	18	12	0.3820	0.0757	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	18	5	0.2300	0.0755	0.57	EPA Inhalation RfCi	0.1319
Nonane	111-84-2	18	9	0.1294	0.0559	3.8	EPA Inhalation RfCi	0.0147
o-Xylene	95-47-6	18	12	0.5830	0.1697	23	EPA RSL Non-Cancer	0.0074
Pentane	109-66-0	18	18	32.2527	1.332	338	EPA Inhalation RfCi	0.0039
Propane	74-98-6	18	18	14.6000	3.8254	NA	NA	
Propylbenzene	103-65-1	18	3	0.3500	0.097	203	EPA Inhalation RfCi	0.0005
Propylene	115-07-1	18	18	0.5780	0.2796	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	18	5	0.4000	0.115	5.9	EPA Inhalation RfCi	0.0195
Toluene	108-88-3	18	18	5.6300	0.6865	1,327	EPA Inhalation RfCi	0.0005
Trans-2-Butene	624-64-6	18	7	1.1033	0.0596	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	18	5	3.6620	0.0358	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	18	11	0.1204	0.0874	55	TCEQ Long-Term AMCV	0.0016
							Hazard Index	**0.5833**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

CM3 - Adams High School | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	23	19	0.8931	0.0602	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	23	2	0.3664	0.0272	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	23	5	4.4763	0.041	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	23	7	0.1334	0.0264	12	EPA Inhalation RfCi	0.0022
1,2,4-Trimethylbenzene	95-63-6	23	15	0.2180	0.0505	12	EPA Inhalation RfCi	0.0041
1,3-Butadiene	106-99-0	23	10	0.2090	0.0254	0.95	EPA RSL Non-Cancer	0.0268
1,3-Diethylbenzene	141-93-5	23	3	0.1600	0.0695	45	TCEQ Long-Term AMCV	0.0015
1,3,5-Trimethylbenzene	108-67-8	23	3	0.1410	0.0244	12	EPA Inhalation RfCi	0.0020
1,4-Diethylbenzene	105-05-5	23	10	0.1940	0.067	45	TCEQ Long-Term AMCV	0.0015
2-Ethyltoluene	611-14-3	23	2	0.1000	0.0418	25	TCEQ Long-Term AMCV	0.0017
2-Methylheptane	592-27-8	23	5	0.4086	0.0277	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	23	11	2.2326	0.1397	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	23	21	0.6720	0.2137	190	TCEQ Long-Term AMCV	0.0011
2,2-Dimethylbutane	75-83-2	23	5	2.2300	0.0299	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	23	14	1.3900	0.0602	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	23	8	18.1862	0.0651	190	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylpentane	565-59-3	23	10	1.3917	0.0364	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	23	5	0.3816	0.0731	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	23	10	1.3669	0.0485	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	23	9	0.4212	0.0435	25	TCEQ Long-Term AMCV	0.0017
3-Methylheptane	589-81-1	23	8	0.4900	0.1477	380	TCEQ Long-Term AMCV	0.0004
3-Methylhexane	589-34-4	23	17	2.1226	0.2725	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	23	20	10.2662	0.2093	190	TCEQ Long-Term AMCV	0.0011
4-Ethyltoluene	622-96-8	23	3	0.1540	0.0302	25	TCEQ Long-Term AMCV	0.0012
Acetylene	74-86-2	23	23	1.6800	0.623	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	23	22	3.8700	0.1619	3	ATSDR Chronic MRL	0.0540
Butane	106-97-8	23	22	73.4023	1.7952	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	23	11	1.1100	0.1111	225	EPA Inhalation RfCi	0.0005
Cis-2-Butene	590-18-1	23	4	6.1105	0.0345	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	23	1	4.7134	0.0316	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	23	15	2.4500	0.0659	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	23	7	6.0125	0.0559	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	23	11	0.2920	0.0279	190	TCEQ Long-Term AMCV	0.0001
Dodecane	112-40-3	23	12	1.1500	0.1471	3.8	CDPHE Chronic	0.0387
Ethane	74-84-0	23	23	13.0000	7.5189	NA	NA	
Ethylbenzene	100-41-4	23	16	0.3520	0.0579	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	23	23	2.8000	1.1523	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	23	22	1.3600	0.106	98	EPA Inhalation RfCi	0.0011
Hexane	110-54-3	23	23	7.9700	0.2292	199	EPA Inhalation RfCi	0.0012
Isobutane	75-28-5	23	23	10.0503	0.6384	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	23	22	136.5058	0.8569	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	23	5	0.3304	0.0407	140	TCEQ Long-Term AMCV	0.0003
Isopropylbenzene	98-82-8	23	1	0.1400	0.0236	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3 &/..	23	18	1.1700	0.1617	23	EPA RSL Non-Cancer	0.0070
Methylcyclohexane	108-87-2	23	12	1.4736	0.0447	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	23	20	6.9197	0.2028	75	TCEQ Long-Term AMCV	0.0027
n-Octane	111-65-9	23	14	0.2920	0.0417	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	23	4	0.2500	0.031	0.57	EPA Inhalation RfCi	0.0542
Nonane	111-84-2	23	9	0.2300	0.0682	3.8	EPA Inhalation RfCi	0.0179
o-Xylene	95-47-6	23	16	0.3380	0.0637	23	EPA RSL Non-Cancer	0.0028
Pentane	109-66-0	23	23	45.9298	0.7982	338	EPA Inhalation RfCi	0.0024
Propane	74-98-6	23	23	7.7972	3.1511	NA	NA	
Propylbenzene	103-65-1	23	3	0.1590	0.0241	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	23	23	0.6870	0.2766	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	23	4	0.3950	0.0261	5.9	EPA Inhalation RfCi	0.0044
Toluene	108-88-3	23	23	4.9500	0.4137	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	23	3	3.9651	0.0314	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	23	3	9.4614	0.0855	560	TCEQ Long-Term AMCV	0.0002
Undecane	1120-21-4	23	15	0.1540	0.0399	55	TCEQ Long-Term AMCV	0.0007
							Hazard Index	**0.2376**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

CM4 - Adams Middle School | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	20	13	1.7000	0.1074	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	20	1	0.4000	0.0319	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	20	7	1.6000	0.0347	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	20	11	0.2400	0.0672	12	EPA Inhalation RfCi	0.0055
1,2,4-Trimethylbenzene	95-63-6	20	17	0.2800	0.0778	12	EPA Inhalation RfCi	0.0064
1,3-Butadiene	106-99-0	20	10	0.3000	0.0768	0.95	EPA RSL Non-Cancer	0.0809
1,3-Diethylbenzene	141-93-5	20	4	0.5900	0.0555	45	TCEQ Long-Term AMCV	0.0012
1,3,5-Trimethylbenzene	108-67-8	20	6	0.1450	0.0454	12	EPA Inhalation RfCi	0.0037
1,4-Diethylbenzene	105-05-5	20	10	0.1600	0.0495	45	TCEQ Long-Term AMCV	0.0011
2-Ethyltoluene	611-14-3	20	3	0.2400	0.0319	25	TCEQ Long-Term AMCV	0.0013
2-Methylheptane	592-27-8	20	7	0.2600	0.0327	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	20	10	0.9700	0.1179	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	20	16	9.2000	0.2829	190	TCEQ Long-Term AMCV	0.0015
2,2-Dimethylbutane	75-83-2	20	7	1.2000	0.034	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	20	15	0.5500	0.0857	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	20	10	2.2000	0.0832	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	20	17	0.5000	0.1246	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	20	3	0.1764	0.054	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	20	11	0.4600	0.1002	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	20	8	0.1900	0.0428	25	TCEQ Long-Term AMCV	0.0017
3-Methylheptane	589-81-1	20	7	0.1450	0.0562	380	TCEQ Long-Term AMCV	0.0001
3-Methylhexane	589-34-4	20	14	1.1000	0.2311	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	20	15	5.1000	0.1895	190	TCEQ Long-Term AMCV	0.0010
4-Ethyltoluene	622-96-8	20	3	0.1340	0.0347	25	TCEQ Long-Term AMCV	0.0014
Acetylene	74-86-2	20	20	4.6400	0.7045	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	20	19	1.9000	0.2544	3	ATSDR Chronic MRL	0.0848
Butane	106-97-8	20	20	180.0000	2.5999	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	20	10	0.6210	0.1444	225	EPA Inhalation RfCi	0.0006
Cis-2-Butene	590-18-1	20	6	3.6000	0.0381	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	20	4	1.7000	0.0333	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	20	17	1.8000	0.1149	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	20	9	1.9000	0.1138	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	20	13	0.7700	0.0932	190	TCEQ Long-Term AMCV	0.0005
Dodecane	112-40-3	20	10	0.5984	0.1501	3.8	CDPHE Chronic	0.0395
Ethane	74-84-0	20	20	52.2000	9.1146	NA	NA	
Ethylbenzene	100-41-4	20	16	0.4600	0.0926	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	20	20	6.5700	1.2643	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	20	18	1.0000	0.1703	98	EPA Inhalation RfCi	0.0017
Hexane	110-54-3	20	20	7.5000	0.3741	199	EPA Inhalation RfCi	0.0019
Isobutane	75-28-5	20	20	52.0000	1.0185	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	20	19	68.0000	2.0229	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	20	6	0.2500	0.0326	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	20	5	0.1360	0.043	81	EPA Inhalation RfCi	0.0005
m,p-Xylenes	108-38-3 &/..	20	18	1.5000	0.2095	23	EPA RSL Non-Cancer	0.0091
Methylcyclohexane	108-87-2	20	11	0.7400	0.0921	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	20	14	3.1000	0.1869	75	TCEQ Long-Term AMCV	0.0025
n-Octane	111-65-9	20	13	0.2200	0.0805	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	20	4	0.1280	0.0353	0.57	EPA Inhalation RfCi	0.0617
Nonane	111-84-2	20	7	0.4200	0.0517	3.8	EPA Inhalation RfCi	0.0136
o-Xylene	95-47-6	20	17	0.6900	0.1029	23	EPA RSL Non-Cancer	0.0045
Pentane	109-66-0	20	19	39.0000	1.6188	338	EPA Inhalation RfCi	0.0048
Propane	74-98-6	20	20	51.6000	4.2606	NA	NA	
Propylbenzene	103-65-1	20	5	0.1360	0.0432	203	EPA Inhalation RfCi	0.0002
Propylene	115-07-1	20	20	3.2800	0.3038	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	20	7	0.1970	0.0569	5.9	EPA Inhalation RfCi	0.0096
Toluene	108-88-3	20	20	12.0000	0.6139	1,327	EPA Inhalation RfCi	0.0005
Trans-2-Butene	624-64-6	20	7	4.5000	0.0387	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	20	7	3.4000	0.0395	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	20	13	0.2973	0.0855	55	TCEQ Long-Term AMCV	0.0016
							Hazard Index	**0.3484**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

CM5 - Central | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	19	12	0.4270	0.0508	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	19	0	< 0.0654	0.0253	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	19	5	0.1180	0.0313	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	19	5	0.1140	0.049	12	EPA Inhalation RfCi	0.0040
1,2,4-Trimethylbenzene	95-63-6	19	12	0.1500	0.0651	12	EPA Inhalation RfCi	0.0053
1,3-Butadiene	106-99-0	19	10	0.1840	0.0541	0.95	EPA RSL Non-Cancer	0.0570
1,3-Diethylbenzene	141-93-5	19	4	0.1300	0.0553	45	TCEQ Long-Term AMCV	0.0012
1,3,5-Trimethylbenzene	108-67-8	19	3	0.0867	0.0317	12	EPA Inhalation RfCi	0.0026
1,4-Diethylbenzene	105-05-5	19	7	0.0900	0.05	45	TCEQ Long-Term AMCV	0.0011
2-Ethyltoluene	611-14-3	19	0	< 0.0654	0.0252	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	19	3	0.1190	0.0324	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	19	13	0.3600	0.0898	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	19	18	0.9510	0.2689	190	TCEQ Long-Term AMCV	0.0014
2,2-Dimethylbutane	75-83-2	19	3	0.1030	0.0259	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	19	13	0.2070	0.071	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	19	7	0.1830	0.0483	190	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylpentane	565-59-3	19	10	0.2390	0.0629	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	19	1	0.0674	0.0258	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	19	8	0.4100	0.0746	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	19	8	0.1320	0.0489	25	TCEQ Long-Term AMCV	0.0020
3-Methylheptane	589-81-1	19	6	0.3900	0.1071	380	TCEQ Long-Term AMCV	0.0003
3-Methylhexane	589-34-4	19	17	0.4100	0.2403	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	19	17	0.5871	0.2078	190	TCEQ Long-Term AMCV	0.0011
4-Ethyltoluene	622-96-8	19	2	0.0909	0.0366	25	TCEQ Long-Term AMCV	0.0015
Acetylene	74-86-2	19	19	1.9300	0.6789	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	19	18	0.5100	0.182	3	ATSDR Chronic MRL	0.0607
Butane	106-97-8	19	19	6.2000	1.9586	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	19	4	0.2670	0.0762	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	19	3	0.1890	0.0337	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	19	2	0.0667	0.0249	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	19	14	0.4450	0.0831	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	19	9	0.2250	0.0366	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	19	6	0.1424	0.0541	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	19	6	0.2479	0.0808	3.8	CDPHE Chronic	0.0213
Ethane	74-84-0	19	19	17.6000	8.3824	NA	NA	
Ethylbenzene	100-41-4	19	12	0.1790	0.0747	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	19	19	3.4600	1.1552	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	19	17	0.4440	0.1386	98	EPA Inhalation RfCi	0.0014
Hexane	110-54-3	19	18	1.0000	0.2738	199	EPA Inhalation RfCi	0.0014
Isobutane	75-28-5	19	19	1.9600	0.7391	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	19	19	3.9000	1.2035	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	19	6	0.2030	0.0329	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	19	2	0.0893	0.0292	81	EPA Inhalation RfCi	0.0004
m,p-Xylenes	108-38-3 &/ ..	19	18	0.5400	0.1861	23	EPA RSL Non-Cancer	0.0081
Methylcyclohexane	108-87-2	19	9	0.4160	0.0635	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	19	15	0.7980	0.1707	75	TCEQ Long-Term AMCV	0.0023
n-Octane	111-65-9	19	11	0.1470	0.0614	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	19	2	0.1980	0.0363	0.57	EPA Inhalation RfCi	0.0634
Nonane	111-84-2	19	6	0.1130	0.0397	3.8	EPA Inhalation RfCi	0.0104
o-Xylene	95-47-6	19	13	0.2000	0.0832	23	EPA RSL Non-Cancer	0.0036
Pentane	109-66-0	19	19	2.5400	0.9124	338	EPA Inhalation RfCi	0.0027
Propane	74-98-6	19	19	8.3000	3.7052	NA	NA	
Propylbenzene	103-65-1	19	2	0.1010	0.0319	203	EPA Inhalation RfCi	0.0002
Propylene	115-07-1	19	19	0.6940	0.2554	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	19	3	0.1210	0.0375	5.9	EPA Inhalation RfCi	0.0064
Toluene	108-88-3	19	19	1.2000	0.4578	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	19	4	0.2290	0.0316	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	19	4	0.3860	0.0291	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	19	12	0.1502	0.0609	55	TCEQ Long-Term AMCV	0.0011
							Hazard Index	**0.2665**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

CM6 - Focus | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	16	8	0.2310	0.0502	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	16	0	< 0.0637	0.0258	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	16	4	0.1017	0.0405	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	16	3	0.0994	0.0486	12	EPA Inhalation RfCi	0.0040
1,2,4-Trimethylbenzene	95-63-6	16	10	0.1030	0.0676	12	EPA Inhalation RfCi	0.0055
1,3-Butadiene	106-99-0	16	5	0.1690	0.0405	0.95	EPA RSL Non-Cancer	0.0427
1,3-Diethylbenzene	141-93-5	16	3	0.1300	0.0641	45	TCEQ Long-Term AMCV	0.0014
1,3,5-Trimethylbenzene	108-67-8	16	1	0.0906	0.0235	12	EPA Inhalation RfCi	0.0019
1,4-Diethylbenzene	105-05-5	16	5	0.0940	0.0406	45	TCEQ Long-Term AMCV	0.0009
2-Ethyltoluene	611-14-3	16	0	< 0.0637	0.0256	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	16	1	0.0666	0.0262	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	16	12	0.1939	0.1083	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	16	14	0.5240	0.2961	190	TCEQ Long-Term AMCV	0.0016
2,2-Dimethylbutane	75-83-2	16	4	0.0833	0.0263	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	16	12	0.1800	0.0634	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	16	7	0.1160	0.0504	190	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylpentane	565-59-3	16	8	0.1330	0.0629	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	16	0	< 0.0637	0.0261	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	16	8	0.5400	0.0541	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	16	7	0.1260	0.0675	25	TCEQ Long-Term AMCV	0.0027
3-Methylheptane	589-81-1	16	5	0.4500	0.1634	380	TCEQ Long-Term AMCV	0.0004
3-Methylhexane	589-34-4	16	13	0.4300	0.2727	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	16	13	0.6423	0.2483	190	TCEQ Long-Term AMCV	0.0013
4-Ethyltoluene	622-96-8	16	1	0.0923	0.0289	25	TCEQ Long-Term AMCV	0.0012
Acetylene	74-86-2	16	16	2.5200	0.7068	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	16	15	0.4000	0.1809	3	ATSDR Chronic MRL	0.0603
Butane	106-97-8	16	16	4.5100	1.8518	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	16	6	0.1440	0.0628	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	16	3	0.1260	0.0266	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	16	0	< 0.0637	0.0252	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	16	13	0.3150	0.0747	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	16	10	0.4370	0.0498	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	16	6	0.6900	0.0587	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	16	7	0.1510	0.0766	3.8	CDPHE Chronic	0.0202
Ethane	74-84-0	16	16	21.0000	9.1211	NA	NA	
Ethylbenzene	100-41-4	16	12	0.1639	0.0843	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	16	16	2.8700	1.1738	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	16	15	0.3180	0.1299	98	EPA Inhalation RfCi	0.0013
Hexane	110-54-3	16	16	0.6330	0.2844	199	EPA Inhalation RfCi	0.0014
Isobutane	75-28-5	16	16	1.7200	0.7952	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	16	15	2.2800	0.8851	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	16	5	0.4300	0.0526	140	TCEQ Long-Term AMCV	0.0004
Isopropylbenzene	98-82-8	16	1	0.0887	0.0228	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3 &/..	16	16	0.6290	0.2692	23	EPA RSL Non-Cancer	0.0117
Methylcyclohexane	108-87-2	16	10	0.1660	0.0804	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	16	14	0.3916	0.2383	75	TCEQ Long-Term AMCV	0.0032
n-Octane	111-65-9	16	9	0.1310	0.06	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	16	2	0.0717	0.0296	0.57	EPA Inhalation RfCi	0.0517
Nonane	111-84-2	16	5	0.1106	0.0491	3.8	EPA Inhalation RfCi	0.0129
o-Xylene	95-47-6	16	12	0.1634	0.0934	23	EPA RSL Non-Cancer	0.0041
Pentane	109-66-0	16	16	2.3022	1.1893	338	EPA Inhalation RfCi	0.0035
Propane	74-98-6	16	16	8.7800	3.4266	NA	NA	
Propylbenzene	103-65-1	16	1	0.0978	0.0231	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	16	16	0.5650	0.2715	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	16	1	0.1250	0.0247	5.9	EPA Inhalation RfCi	0.0042
Toluene	108-88-3	16	16	0.8600	0.4753	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	16	3	0.1400	0.0324	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	16	4	0.5080	0.0939	560	TCEQ Long-Term AMCV	0.0002
Undecane	1120-21-4	16	9	0.1461	0.0639	55	TCEQ Long-Term AMCV	0.0012
							Hazard Index	**0.2457**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

CM7 - Kearney | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	18	10	1.4000	0.2557	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	18	0	< 0.0640	0.0259	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	18	3	0.0908	0.0267	560	TCEQ Long-Term AMCV	0.0000
1,2,3-Trimethylbenzene	526-73-8	18	5	0.1400	0.0336	12	EPA Inhalation RfCi	0.0028
1,2,4-Trimethylbenzene	95-63-6	18	13	0.3480	0.0711	12	EPA Inhalation RfCi	0.0058
1,3-Butadiene	106-99-0	18	8	0.1590	0.0505	0.95	EPA RSL Non-Cancer	0.0532
1,3-Diethylbenzene	141-93-5	18	4	0.1400	0.0657	45	TCEQ Long-Term AMCV	0.0015
1,3,5-Trimethylbenzene	108-67-8	18	3	0.0917	0.0317	12	EPA Inhalation RfCi	0.0026
1,4-Diethylbenzene	105-05-5	18	8	0.1200	0.0587	45	TCEQ Long-Term AMCV	0.0013
2-Ethyltoluene	611-14-3	18	2	0.0888	0.0259	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	18	3	0.0813	0.0363	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	18	11	0.2300	0.1097	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	18	17	1.0626	0.2704	190	TCEQ Long-Term AMCV	0.0014
2,2-Dimethylbutane	75-83-2	18	4	0.1432	0.0266	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	18	12	0.2330	0.0824	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	18	8	0.3066	0.0734	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	18	10	0.3140	0.0638	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	18	1	0.1536	0.0504	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	18	7	0.6681	0.0665	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	18	7	0.2838	0.0358	25	TCEQ Long-Term AMCV	0.0014
3-Methylheptane	589-81-1	18	6	0.1747	0.0691	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	18	14	0.4500	0.2346	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	18	16	0.8349	0.2151	190	TCEQ Long-Term AMCV	0.0011
4-Ethyltoluene	622-96-8	18	3	0.0970	0.0374	25	TCEQ Long-Term AMCV	0.0015
Acetylene	74-86-2	18	18	1.9700	0.682	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	18	17	0.5600	0.1885	3	ATSDR Chronic MRL	0.0628
Butane	106-97-8	18	18	8.1000	1.8101	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	18	3	0.6330	0.146	225	EPA Inhalation RfCi	0.0006
Cis-2-Butene	590-18-1	18	5	0.2570	0.0339	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	18	3	0.0864	0.0255	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	18	15	0.6790	0.0888	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	18	8	0.3340	0.035	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	18	8	0.2430	0.0697	190	TCEQ Long-Term AMCV	0.0004
Dodecane	112-40-3	18	7	0.2477	0.0964	3.8	CDPHE Chronic	0.0254
Ethane	74-84-0	18	18	26.0000	8.1273	NA	NA	
Ethylbenzene	100-41-4	18	14	0.3850	0.0773	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	18	18	3.2100	1.1579	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	18	17	0.5200	0.146	98	EPA Inhalation RfCi	0.0015
Hexane	110-54-3	18	18	1.1000	0.2922	199	EPA Inhalation RfCi	0.0015
Isobutane	75-28-5	18	18	2.5000	0.6802	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	18	18	3.0129	1.2032	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	18	3	0.0798	0.0264	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	18	2	0.0814	0.0293	81	EPA Inhalation RfCi	0.0004
m,p-Xylenes	108-38-3 &/..	18	18	0.9620	0.2025	23	EPA RSL Non-Cancer	0.0088
Methylcyclohexane	108-87-2	18	10	0.1380	0.0727	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	18	14	0.4200	0.1633	75	TCEQ Long-Term AMCV	0.0022
n-Octane	111-65-9	18	10	0.2570	0.0731	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	18	4	0.0830	0.0469	0.57	EPA Inhalation RfCi	0.0820
Nonane	111-84-2	18	8	0.1931	0.0538	3.8	EPA Inhalation RfCi	0.0141
o-Xylene	95-47-6	18	13	0.3580	0.0881	23	EPA RSL Non-Cancer	0.0038
Pentane	109-66-0	18	18	2.5000	0.8521	338	EPA Inhalation RfCi	0.0025
Propane	74-98-6	18	18	14.0000	3.3131	NA	NA	
Propylbenzene	103-65-1	18	3	0.0948	0.032	203	EPA Inhalation RfCi	0.0002
Propylene	115-07-1	18	18	0.6030	0.2539	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	18	3	0.1090	0.0374	5.9	EPA Inhalation RfCi	0.0063
Toluene	108-88-3	18	18	1.7300	0.4737	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	18	4	0.2080	0.0339	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	18	3	0.4340	0.0293	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	18	12	0.1500	0.0665	55	TCEQ Long-Term AMCV	0.0012
							Hazard Index	**0.2919**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

CM8 - Monroe | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	16	11	0.6300	0.0845	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	16	0	< 0.0631	0.0254	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	16	7	0.3190	0.046	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	16	10	0.2000	0.1016	12	EPA Inhalation RfCi	0.0083
1,2,4-Trimethylbenzene	95-63-6	16	11	0.3050	0.079	12	EPA Inhalation RfCi	0.0065
1,3-Butadiene	106-99-0	16	6	0.2200	0.0568	0.95	EPA RSL Non-Cancer	0.0598
1,3-Diethylbenzene	141-93-5	16	4	0.1800	0.0753	45	TCEQ Long-Term AMCV	0.0017
1,3,5-Trimethylbenzene	108-67-8	16	4	0.1120	0.0332	12	EPA Inhalation RfCi	0.0027
1,4-Diethylbenzene	105-05-5	16	8	0.3000	0.1236	45	TCEQ Long-Term AMCV	0.0027
2-Ethyltoluene	611-14-3	16	3	0.1500	0.0624	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	16	6	0.2500	0.0503	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	16	10	0.7290	0.134	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	16	14	3.4800	0.3859	190	TCEQ Long-Term AMCV	0.0020
2,2-Dimethylbutane	75-83-2	16	5	0.3590	0.038	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	16	11	0.3200	0.0666	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	16	10	0.7560	0.1202	190	TCEQ Long-Term AMCV	0.0006
2,3-Dimethylpentane	565-59-3	16	13	0.2870	0.0913	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	16	2	0.0780	0.0258	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	16	10	0.6400	0.0797	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	16	8	0.1900	0.0957	25	TCEQ Long-Term AMCV	0.0038
3-Methylheptane	589-81-1	16	9	0.6720	0.0706	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	16	12	0.7240	0.2559	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	16	15	2.0500	0.2834	190	TCEQ Long-Term AMCV	0.0015
4-Ethyltoluene	622-96-8	16	4	0.1180	0.0354	25	TCEQ Long-Term AMCV	0.0014
Acetylene	74-86-2	16	16	1.9900	0.6317	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	16	15	1.1100	0.2591	3	ATSDR Chronic MRL	0.0864
Butane	106-97-8	16	16	29.0000	2.7963	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	16	7	0.2810	0.0748	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	16	5	1.1500	0.0357	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	16	3	0.3200	0.0255	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	16	12	1.4200	0.1027	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	16	11	0.8760	0.0947	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	16	12	0.1960	0.1019	190	TCEQ Long-Term AMCV	0.0005
Dodecane	112-40-3	16	6	0.4900	0.1906	3.8	CDPHE Chronic	0.0502
Ethane	74-84-0	16	16	20.2000	7.6489	NA	NA	
Ethylbenzene	100-41-4	16	11	0.2960	0.0739	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	16	16	3.4000	1.098	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	16	14	0.7600	0.1641	98	EPA Inhalation RfCi	0.0017
Hexane	110-54-3	16	16	3.2600	0.4568	199	EPA Inhalation RfCi	0.0023
Isobutane	75-28-5	16	16	13.0000	1.1215	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	16	16	17.9000	1.9477	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	16	3	0.0910	0.0259	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	16	1	0.0976	0.0225	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3 &/..	16	14	1.0900	0.1881	23	EPA RSL Non-Cancer	0.0082
Methylcyclohexane	108-87-2	16	11	0.6090	0.1054	400	TCEQ Long-Term AMCV	0.0003
Methylcyclopentane	96-37-7	16	12	1.3300	0.2194	75	TCEQ Long-Term AMCV	0.0029
n-Octane	111-65-9	16	8	0.2930	0.0693	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	16	1	0.0776	0.029	0.57	EPA Inhalation RfCi	0.0507
Nonane	111-84-2	16	11	0.3320	0.0735	3.8	EPA Inhalation RfCi	0.0193
o-Xylene	95-47-6	16	11	0.3670	0.0853	23	EPA RSL Non-Cancer	0.0037
Pentane	109-66-0	16	16	11.8000	1.5534	338	EPA Inhalation RfCi	0.0046
Propane	74-98-6	16	16	38.3000	6.6928	NA	NA	
Propylbenzene	103-65-1	16	4	0.1150	0.0306	203	EPA Inhalation RfCi	0.0002
Propylene	115-07-1	16	16	2.3200	0.2796	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	16	4	0.1210	0.0436	5.9	EPA Inhalation RfCi	0.0074
Toluene	108-88-3	16	16	2.1600	0.5412	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	16	4	1.2100	0.0351	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	16	6	0.6890	0.0437	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	16	12	0.2200	0.1168	55	TCEQ Long-Term AMCV	0.0021
							Hazard Index	**0.3390**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

CM9 - 48th and Race | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	17	11	2.9000	0.0743	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	17	2	0.0949	0.0285	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	17	7	0.1010	0.0528	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	17	9	0.4580	0.0664	12	EPA Inhalation RfCi	0.0054
1,2,4-Trimethylbenzene	95-63-6	17	16	1.4000	0.1479	12	EPA Inhalation RfCi	0.0121
1,3-Butadiene	106-99-0	17	8	0.2430	0.0565	0.95	EPA RSL Non-Cancer	0.0595
1,3-Diethylbenzene	141-93-5	17	3	0.4200	0.066	45	TCEQ Long-Term AMCV	0.0015
1,3,5-Trimethylbenzene	108-67-8	17	6	0.4977	0.0441	12	EPA Inhalation RfCi	0.0036
1,4-Diethylbenzene	105-05-5	17	6	0.2170	0.0705	45	TCEQ Long-Term AMCV	0.0016
2-Ethyltoluene	611-14-3	17	3	0.3700	0.0287	25	TCEQ Long-Term AMCV	0.0011
2-Methylheptane	592-27-8	17	4	0.2340	0.0365	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	17	10	0.5790	0.1375	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	17	17	1.5800	0.3068	190	TCEQ Long-Term AMCV	0.0016
2,2-Dimethylbutane	75-83-2	17	6	0.2110	0.0294	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	17	16	0.7190	0.0993	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	17	6	0.3810	0.0823	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	17	11	0.3260	0.0905	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	17	1	0.1410	0.0289	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	17	9	0.8150	0.0687	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	17	10	0.5500	0.1084	25	TCEQ Long-Term AMCV	0.0043
3-Methylheptane	589-81-1	17	8	0.3400	0.0928	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	17	14	0.6410	0.2489	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	17	16	1.5600	0.3149	190	TCEQ Long-Term AMCV	0.0017
4-Ethyltoluene	622-96-8	17	6	0.4250	0.0494	25	TCEQ Long-Term AMCV	0.0020
Acetylene	74-86-2	17	17	2.6700	0.7203	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	17	17	0.5590	0.2387	3	ATSDR Chronic MRL	0.0796
Butane	106-97-8	17	16	49.7000	2.6813	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	17	5	0.3960	0.0971	225	EPA Inhalation RfCi	0.0004
Cis-2-Butene	590-18-1	17	5	0.1650	0.0362	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	17	3	0.1290	0.028	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	17	13	1.2270	0.155	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	17	8	0.5250	0.0477	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	17	14	1.5400	0.1547	190	TCEQ Long-Term AMCV	0.0008
Dodecane	112-40-3	17	13	0.2658	0.1617	3.8	CDPHE Chronic	0.0426
Ethane	74-84-0	17	17	63.0000	36.0036	NA	NA	
Ethylbenzene	100-41-4	17	16	2.6500	0.1514	230	EPA Inhalation RfCi	0.0007
Ethylene	74-85-1	17	17	11.0000	1.6524	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	17	17	1.0710	0.1926	98	EPA Inhalation RfCi	0.0020
Hexane	110-54-3	17	17	1.8900	0.4042	199	EPA Inhalation RfCi	0.0020
Isobutane	75-28-5	17	17	32.1000	1.0403	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	17	17	56.2000	3.4233	8100	TCEQ Long-Term AMCV	0.0004
Isoprene	78-79-5	17	1	0.2290	0.0291	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	17	3	0.1100	0.0332	81	EPA Inhalation RfCi	0.0004
m,p-Xylenes	108-38-3 &/..	17	17	11.7000	0.4289	23	EPA RSL Non-Cancer	0.0186
Methylcyclohexane	108-87-2	17	9	0.7390	0.0843	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	17	11	0.9970	0.1793	75	TCEQ Long-Term AMCV	0.0024
n-Octane	111-65-9	17	14	1.3000	0.0787	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	17	3	0.1300	0.041	0.57	EPA Inhalation RfCi	0.0716
Nonane	111-84-2	17	11	0.8780	0.0837	3.8	EPA Inhalation RfCi	0.0220
o-Xylene	95-47-6	17	16	2.9300	0.1662	23	EPA RSL Non-Cancer	0.0072
Pentane	109-66-0	17	17	61.1000	4.0411	338	EPA Inhalation RfCi	0.0119
Propane	74-98-6	17	17	107.0000	6.011	NA	NA	
Propylbenzene	103-65-1	17	6	0.3710	0.0424	203	EPA Inhalation RfCi	0.0002
Propylene	115-07-1	17	17	0.9850	0.3135	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	17	3	0.1280	0.0417	5.9	EPA Inhalation RfCi	0.0071
Toluene	108-88-3	17	17	23.8000	1.1804	1,327	EPA Inhalation RfCi	0.0009
Trans-2-Butene	624-64-6	17	5	0.1790	0.0354	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	17	3	0.5090	0.0327	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	17	14	0.6620	0.1253	55	TCEQ Long-Term AMCV	0.0023
							Hazard Index	**0.3719**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

CM10 - Alsup Elementary School | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	16	10	1.3000	0.0648	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	16	0	< 0.0669	0.0247	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	16	7	0.1600	0.0371	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	16	6	0.2200	0.0436	12	EPA Inhalation RfCi	0.0036
1,2,4-Trimethylbenzene	95-63-6	16	10	0.2100	0.0616	12	EPA Inhalation RfCi	0.0050
1,3-Butadiene	106-99-0	16	8	0.2500	0.049	0.95	EPA RSL Non-Cancer	0.0516
1,3-Diethylbenzene	141-93-5	16	3	0.1800	0.0473	45	TCEQ Long-Term AMCV	0.0011
1,3,5-Trimethylbenzene	108-67-8	16	4	0.1120	0.0306	12	EPA Inhalation RfCi	0.0025
1,4-Diethylbenzene	105-05-5	16	5	0.5100	0.044	45	TCEQ Long-Term AMCV	0.0010
2-Ethyltoluene	611-14-3	16	3	0.2400	0.0312	25	TCEQ Long-Term AMCV	0.0012
2-Methylheptane	592-27-8	16	6	0.6137	0.1458	380	TCEQ Long-Term AMCV	0.0004
2-Methylhexane	591-76-4	16	11	0.4300	0.1216	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	16	15	1.2000	0.328	190	TCEQ Long-Term AMCV	0.0017
2,2-Dimethylbutane	75-83-2	16	3	0.1400	0.0335	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	16	12	0.2700	0.0936	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	16	8	0.3135	0.0732	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	16	10	0.2100	0.0684	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	16	2	0.0740	0.0251	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	16	8	0.4900	0.0617	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	16	7	0.4200	0.0686	25	TCEQ Long-Term AMCV	0.0027
3-Methylheptane	589-81-1	16	7	0.3900	0.0603	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	16	12	0.4900	0.2665	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	16	14	0.7600	0.19	190	TCEQ Long-Term AMCV	0.0010
4-Ethyltoluene	622-96-8	16	4	0.1140	0.0349	25	TCEQ Long-Term AMCV	0.0014
Acetylene	74-86-2	16	16	2.4000	0.7364	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	16	15	0.8400	0.216	3	ATSDR Chronic MRL	0.0720
Butane	106-97-8	16	16	18.0000	2.1824	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	16	6	0.2920	0.0856	225	EPA Inhalation RfCi	0.0004
Cis-2-Butene	590-18-1	16	2	0.5800	0.0258	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	16	3	0.1200	0.0243	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	16	12	0.4700	0.0991	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	16	10	0.2900	0.0804	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	16	10	0.1300	0.0608	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	16	8	0.3900	0.0862	3.8	CDPHE Chronic	0.0227
Ethane	74-84-0	16	16	27.0000	8.1395	NA	NA	
Ethylbenzene	100-41-4	16	11	3.4000	0.0939	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	16	16	4.5000	1.2595	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	16	15	0.5500	0.1666	98	EPA Inhalation RfCi	0.0017
Hexane	110-54-3	16	16	1.6000	0.3664	199	EPA Inhalation RfCi	0.0018
Isobutane	75-28-5	16	16	6.6000	0.8336	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	16	16	290.0000	1.79	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	16	5	0.2941	0.0525	140	TCEQ Long-Term AMCV	0.0004
Isopropylbenzene	98-82-8	16	2	0.0952	0.0219	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3 &/..	16	16	13.0000	0.2615	23	EPA RSL Non-Cancer	0.0114
Methylcyclohexane	108-87-2	16	11	0.3500	0.1125	400	TCEQ Long-Term AMCV	0.0003
Methylcyclopentane	96-37-7	16	11	0.6400	0.2018	75	TCEQ Long-Term AMCV	0.0027
n-Octane	111-65-9	16	11	0.1800	0.0864	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	16	1	0.0797	0.0281	0.57	EPA Inhalation RfCi	0.0491
Nonane	111-84-2	16	7	0.1600	0.0533	3.8	EPA Inhalation RfCi	0.0140
o-Xylene	95-47-6	16	12	3.0000	0.1001	23	EPA RSL Non-Cancer	0.0043
Pentane	109-66-0	16	16	4.3000	1.116	338	EPA Inhalation RfCi	0.0033
Propane	74-98-6	16	16	36.0000	5.0787	NA	NA	
Propylbenzene	103-65-1	16	4	0.1100	0.0307	203	EPA Inhalation RfCi	0.0002
Propylene	115-07-1	16	16	1.4000	0.3299	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	16	3	0.1130	0.0368	5.9	EPA Inhalation RfCi	0.0062
Toluene	108-88-3	16	16	3.6300	0.5424	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	16	3	0.8400	0.0341	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	16	4	0.2200	0.0341	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	16	12	0.2200	0.0698	55	TCEQ Long-Term AMCV	0.0013
							Hazard Index	**0.2701**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

BFD- Brighton | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	15	6	0.2320	0.0577	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	15	1	0.0869	0.0296	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	15	2	0.1670	0.0304	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	15	4	0.1580	0.037	12	EPA Inhalation RfCi	0.0030
1,2,4-Trimethylbenzene	95-63-6	15	10	0.1400	0.0469	12	EPA Inhalation RfCi	0.0038
1,3-Butadiene	106-99-0	15	5	0.1700	0.0424	0.95	EPA RSL Non-Cancer	0.0447
1,3-Diethylbenzene	141-93-5	15	2	0.8700	0.0627	45	TCEQ Long-Term AMCV	0.0014
1,3,5-Trimethylbenzene	108-67-8	15	3	0.0888	0.0331	12	EPA Inhalation RfCi	0.0027
1,4-Diethylbenzene	105-05-5	15	7	0.1400	0.0639	45	TCEQ Long-Term AMCV	0.0014
2-Ethyltoluene	611-14-3	15	0	< 0.0700	0.0291	25	TCEQ Long-Term AMCV	0.0012
2-Methylheptane	592-27-8	15	3	0.0760	0.0301	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	15	6	0.2500	0.0481	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	15	11	0.7700	0.2263	190	TCEQ Long-Term AMCV	0.0012
2,2-Dimethylbutane	75-83-2	15	2	0.0923	0.0299	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	15	7	0.1900	0.0333	380	TCEQ Long-Term AMCV	0.0001
2,3-Dimethylbutane	79-29-8	15	6	0.1540	0.0467	190	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylpentane	565-59-3	15	7	0.1800	0.0403	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	15	0	< 0.0730	0.0299	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	15	8	0.8000	0.0607	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	15	2	0.0998	0.0409	25	TCEQ Long-Term AMCV	0.0016
3-Methylheptane	589-81-1	15	5	0.2100	0.0559	380	TCEQ Long-Term AMCV	0.0001
3-Methylhexane	589-34-4	15	11	0.4200	0.2493	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	15	12	0.5020	0.1683	190	TCEQ Long-Term AMCV	0.0009
4-Ethyltoluene	622-96-8	15	2	0.0902	0.0335	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	15	14	2.4300	0.4537	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	15	14	0.4700	0.1602	3	ATSDR Chronic MRL	0.0534
Butane	106-97-8	15	14	8.7000	2.8166	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	15	6	0.1870	0.0717	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	15	2	0.0740	0.0301	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	15	0	< 0.0680	0.0286	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	15	12	0.3050	0.1012	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	15	7	0.3230	0.0751	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	15	9	0.4540	0.0737	190	TCEQ Long-Term AMCV	0.0004
Dodecane	112-40-3	15	7	0.2466	0.1452	3.8	CDPHE Chronic	0.0382
Ethane	74-84-0	15	15	38.0000	9.6132	NA	NA	
Ethylbenzene	100-41-4	15	10	0.2000	0.0519	230	EPA Inhalation RfCi	0.0002
Ethylene	74-85-1	15	15	3.2000	0.8142	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	15	14	0.3700	0.1403	98	EPA Inhalation RfCi	0.0014
Hexane	110-54-3	15	15	1.2000	0.3315	199	EPA Inhalation RfCi	0.0017
Isobutane	75-28-5	15	14	3.2000	1.0373	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	15	15	4.0000	1.1053	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	15	1	0.0945	0.03	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	15	1	0.0860	0.0255	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3 &/..	15	12	0.5300	0.1373	23	EPA RSL Non-Cancer	0.0060
Methylcyclohexane	108-87-2	15	7	0.3900	0.0652	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	15	10	0.5800	0.1301	75	TCEQ Long-Term AMCV	0.0017
n-Octane	111-65-9	15	10	0.1300	0.0711	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	15	1	0.0910	0.0342	0.57	EPA Inhalation RfCi	0.0598
Nonane	111-84-2	15	7	0.1300	0.0464	3.8	EPA Inhalation RfCi	0.0122
o-Xylene	95-47-6	15	11	0.2100	0.0743	23	EPA RSL Non-Cancer	0.0032
Pentane	109-66-0	15	15	3.1000	1.0529	338	EPA Inhalation RfCi	0.0031
Propane	74-98-6	15	15	23.0000	5.9166	NA	NA	
Propylbenzene	103-65-1	15	2	0.0986	0.026	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	15	15	0.6530	0.1846	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	15	4	0.1140	0.0364	5.9	EPA Inhalation RfCi	0.0062
Toluene	108-88-3	15	14	1.6000	0.3616	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	15	2	0.1150	0.0293	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	15	2	0.2320	0.0329	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	15	12	0.1500	0.0899	55	TCEQ Long-Term AMCV	0.0016
							Hazard Index	**0.2570**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

CAMP- Denver | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	14	9	2.5000	0.5351	2300	TCEQ Long-Term AMCV	0.0002
1-Hexene	592-41-6	14	0	< 0.0632	0.0247	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	14	4	0.0890	0.0407	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	14	6	0.1560	0.0378	12	EPA Inhalation RfCi	0.0031
1,2,4-Trimethylbenzene	95-63-6	14	10	0.1950	0.0813	12	EPA Inhalation RfCi	0.0067
1,3-Butadiene	106-99-0	14	9	0.2090	0.0587	0.95	EPA RSL Non-Cancer	0.0618
1,3-Diethylbenzene	141-93-5	14	3	0.1500	0.0624	45	TCEQ Long-Term AMCV	0.0014
1,3,5-Trimethylbenzene	108-67-8	14	3	0.1410	0.0324	12	EPA Inhalation RfCi	0.0027
1,4-Diethylbenzene	105-05-5	14	5	0.1300	0.0408	45	TCEQ Long-Term AMCV	0.0009
2-Ethyltoluene	611-14-3	14	0	< 0.0632	0.0245	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	14	4	0.0940	0.0253	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	14	8	0.3000	0.0919	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	14	13	0.7300	0.2422	190	TCEQ Long-Term AMCV	0.0013
2,2-Dimethylbutane	75-83-2	14	4	0.0753	0.0252	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	14	10	0.2500	0.0721	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	14	7	0.2883	0.0907	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	14	10	0.2031	0.0817	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	14	0	< 0.0632	0.025	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	14	10	0.4600	0.1029	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	14	8	0.1400	0.044	25	TCEQ Long-Term AMCV	0.0018
3-Methylheptane	589-81-1	14	4	0.2200	0.0649	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	14	10	0.4500	0.2135	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	14	11	0.5390	0.133	190	TCEQ Long-Term AMCV	0.0007
4-Ethyltoluene	622-96-8	14	3	0.1330	0.035	25	TCEQ Long-Term AMCV	0.0014
Acetylene	74-86-2	14	14	1.6000	0.8642	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	14	13	0.8420	0.3069	3	ATSDR Chronic MRL	0.1023
Butane	106-97-8	14	14	5.2900	1.6182	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	14	8	0.5620	0.0475	225	EPA Inhalation RfCi	0.0002
Cis-2-Butene	590-18-1	14	1	0.0815	0.0253	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	14	0	< 0.0632	0.0241	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	14	10	0.3760	0.0838	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	14	8	0.2100	0.042	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	14	5	0.1000	0.0414	190	TCEQ Long-Term AMCV	0.0002
Dodecane	112-40-3	14	7	0.0968	0.0675	3.8	CDPHE Chronic	0.0178
Ethane	74-84-0	14	14	19.2000	9.2045	NA	NA	
Ethylbenzene	100-41-4	14	10	0.3300	0.0709	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	14	14	3.6433	2.1677	5300	TCEQ Long-Term AMCV	0.0004
Heptane	142-82-5	14	11	0.4160	0.1168	98	EPA Inhalation RfCi	0.0012
Hexane	110-54-3	14	13	1.1600	0.2378	199	EPA Inhalation RfCi	0.0012
Isobutane	75-28-5	14	14	1.6200	0.6673	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	14	14	2.3700	1.0935	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	14	2	0.0861	0.033	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	14	3	0.1160	0.0282	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3 &/..	14	13	1.0000	0.1716	23	EPA RSL Non-Cancer	0.0075
Methylcyclohexane	108-87-2	14	9	0.3100	0.0626	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	14	10	0.4200	0.1447	75	TCEQ Long-Term AMCV	0.0019
n-Octane	111-65-9	14	8	0.1900	0.0474	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	14	4	0.1800	0.0375	0.57	EPA Inhalation RfCi	0.0655
Nonane	111-84-2	14	6	0.1060	0.0451	3.8	EPA Inhalation RfCi	0.0118
o-Xylene	95-47-6	14	10	0.3000	0.076	23	EPA RSL Non-Cancer	0.0033
Pentane	109-66-0	14	14	2.0200	0.8854	338	EPA Inhalation RfCi	0.0026
Propane	74-98-6	14	14	9.7300	2.9777	NA	NA	
Propylbenzene	103-65-1	14	3	0.1410	0.0303	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	14	14	0.5556	0.3491	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	14	4	0.1540	0.0336	5.9	EPA Inhalation RfCi	0.0057
Toluene	108-88-3	14	14	1.0700	0.4394	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	14	0	< 0.0632	0.0244	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	14	1	0.2490	0.0274	560	TCEQ Long-Term AMCV	0.0000
Undecane	1120-21-4	14	9	0.1100	0.0557	55	TCEQ Long-Term AMCV	0.0010
							Hazard Index	**0.3103**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Data Summary and Risk Assessment

JUNC- E470/I25 | Q3 2021 - Q4 2023

Compound Name	CAS No	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	14	8	0.6200	0.0341	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	14	1	0.0733	0.0262	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	14	3	0.0810	0.0268	560	TCEQ Long-Term AMCV	0.0000
1,2,3-Trimethylbenzene	526-73-8	14	3	0.2150	0.0357	12	EPA Inhalation RfCi	0.0029
1,2,4-Trimethylbenzene	95-63-6	14	9	0.1310	0.0659	12	EPA Inhalation RfCi	0.0054
1,3-Butadiene	106-99-0	14	7	0.1260	0.0481	0.95	EPA RSL Non-Cancer	0.0507
1,3-Diethylbenzene	141-93-5	14	2	0.0890	0.0424	45	TCEQ Long-Term AMCV	0.0009
1,3,5-Trimethylbenzene	108-67-8	14	2	0.1100	0.0345	12	EPA Inhalation RfCi	0.0028
1,4-Diethylbenzene	105-05-5	14	3	0.2000	0.0264	45	TCEQ Long-Term AMCV	0.0006
2-Ethyltoluene	611-14-3	14	1	0.0750	0.0259	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	14	4	0.2600	0.0269	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	14	7	0.2100	0.0751	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	14	11	0.6160	0.2098	190	TCEQ Long-Term AMCV	0.0011
2,2-Dimethylbutane	75-83-2	14	2	0.3880	0.0268	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	14	10	0.1610	0.0558	380	TCEQ Long-Term AMCV	0.0001
2,3-Dimethylbutane	79-29-8	14	4	0.2230	0.0741	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	14	7	0.0917	0.0356	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	14	1	0.1500	0.0265	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	14	8	0.4700	0.0596	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	14	4	0.1300	0.0347	25	TCEQ Long-Term AMCV	0.0014
3-Methylheptane	589-81-1	14	6	0.2700	0.038	380	TCEQ Long-Term AMCV	0.0001
3-Methylhexane	589-34-4	14	11	1.5100	0.2551	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	14	13	0.9050	0.1574	190	TCEQ Long-Term AMCV	0.0008
4-Ethyltoluene	622-96-8	14	2	0.1030	0.037	25	TCEQ Long-Term AMCV	0.0015
Acetylene	74-86-2	14	14	1.2700	0.3909	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	14	13	0.5250	0.1532	3	ATSDR Chronic MRL	0.0511
Butane	106-97-8	14	14	4.7000	1.5907	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	14	6	0.2300	0.0959	225	EPA Inhalation RfCi	0.0004
Cis-2-Butene	590-18-1	14	0	< 0.0627	0.0263	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	14	0	< 0.0627	0.0256	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	14	11	0.4160	0.0704	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	14	6	0.2130	0.0378	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	14	9	0.8100	0.0518	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	14	8	0.3200	0.1018	3.8	CDPHE Chronic	0.0268
Ethane	74-84-0	14	14	17.6000	6.1077	NA	NA	
Ethylbenzene	100-41-4	14	10	0.1440	0.0608	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	14	14	2.3000	0.9193	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	14	12	0.3500	0.1059	98	EPA Inhalation RfCi	0.0011
Hexane	110-54-3	14	13	0.8230	0.2577	199	EPA Inhalation RfCi	0.0013
Isobutane	75-28-5	14	14	1.8900	0.6253	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	14	14	2.4400	0.8571	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	14	2	0.1125	0.0265	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	14	2	0.0938	0.0238	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3 &/..	14	12	0.3210	0.145	23	EPA RSL Non-Cancer	0.0063
Methylcyclohexane	108-87-2	14	8	0.2200	0.0465	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	14	10	0.4060	0.1742	75	TCEQ Long-Term AMCV	0.0023
n-Octane	111-65-9	14	7	0.3700	0.0399	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	14	1	0.0767	0.0292	0.57	EPA Inhalation RfCi	0.0510
Nonane	111-84-2	14	6	1.3000	0.0978	3.8	EPA Inhalation RfCi	0.0257
o-Xylene	95-47-6	14	10	0.1470	0.0769	23	EPA RSL Non-Cancer	0.0033
Pentane	109-66-0	14	14	3.3700	0.9255	338	EPA Inhalation RfCi	0.0027
Propane	74-98-6	14	14	10.0000	3.2395	NA	NA	
Propylbenzene	103-65-1	14	2	0.1220	0.0334	203	EPA Inhalation RfCi	0.0002
Propylene	115-07-1	14	14	0.4650	0.2082	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	14	4	0.1130	0.0337	5.9	EPA Inhalation RfCi	0.0057
Toluene	108-88-3	14	14	0.8400	0.4126	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	14	1	0.0930	0.026	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	14	2	0.3070	0.0361	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	14	10	0.2300	0.0658	55	TCEQ Long-Term AMCV	0.0012
							Hazard Index	**0.2526**

All results presented in parts per billion by volume (ppbv).
NA=Health reference level not available.
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation. Average and maximum MDL may differ due to varying lab analyses.

Appendix C

Chronic Hazard Quotients for Individual Chemicals from Mobile Monitoring Van Data by Location

Mobile Sampling Van Data Summary and Risk Assessment
Adams City Neighborhood | Q3 2021 - Q4 2023

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	90,079	52,578	0.07	0.02	0.95	EPA RSL Non-Cancer	0.0261
ACETYLENE	74-86-2	90,079	52,578	0.47	0.17	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	90,079	52,578	0.64	0.28	3	ATSDR Chronic MRL	0.0917
BUTANES*	75-28-5	90,079	52,578	3.39	1.96	10000	TCEQ Long-Term AMCV Health	0.0002
BUTENES*	590-18-1	90,079	52,578	2.98	1.53	700	TCEQ Long-Term AMCV Health	0.0022
CARBON DISULFIDE	75-15-0	90,079	52,578	0.01	0.00	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	90,079	52,578	2.88	1.76	590	TCEQ Long-Term AMCV Health	0.0030
DECANES	124-18-5	90,079	52,578	0.27	0.04	190	TCEQ Long-Term AMCV Health	0.0002
DIETHYLBENZENES*	141-93-5	90,079	52,578	0.17	0.06	45	TCEQ Long-Term AMCV Health	0.0014
DIMETHYLCYCLOHEXANES*	638-04-0	90,079	52,578	0.14	0.07	400	CDPHE	0.0002
DODECANES	112-40-3	90,079	52,578	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	90,079	52,578	11.29	6.13	5300	TCEQ Long-Term AMCV Health	0.0012
HEPTANES*	142-82-5	90,079	52,578	0.10	0.06	98	EPA Inhalation RfCi	0.0006
HEXANES*	110-54-3	90,079	52,578	0.31	0.13	199	EPA Inhalation RfCi	0.0006
HEXENES*	592-41-6	90,079	52,578	1.40	0.59	50	TCEQ Long-Term AMCV Health	0.0118
HYDROGEN CYANIDE	74-90-8	90,079	52,578	0.30	0.16	0.75	EPA RSL Non-Cancer	0.2088
HYDROGEN SULFIDE	7783-06-4	90,079	52,578	0.27	0.16	1.4	EPA Inhalation RfCi	0.1090
ISOPRENE	78-79-5	90,079	52,578	0.94	0.25	140	TCEQ Long-Term AMCV Health	0.0018
METHANOL	67-56-1	90,079	52,578	9.58	5.84	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	90,079	52,578	0.10	0.05	400	TCEQ Long-Term AMCV Health	0.0001
NONANES	111-84-2	90,079	52,578	0.09	0.03	3.8	EPA Inhalation RfCi	0.0087
OCTANES*	111-65-9	90,079	52,578	0.09	0.05	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	90,079	52,578	0.27	0.13	339	EPA Inhalation RfCi	0.0004
PROPYLENE	115-07-1	90,079	52,578	0.75	0.31	1801	EPA RSL Non-Cancer	0.0002
STYRENE	100-42-5	90,079	52,578	0.23	0.07	235	EPA Inhalation RfCi	0.0003
TETRACHLOROETHYLENE	127-18-4	90,079	52,578	0.04	0.01	5.9	EPA Inhalation RfCi	0.0015
TOLUENE	108-88-3	90,079	52,578	1.95	0.72	1327	EPA Inhalation RfCi	0.0005
TRIMETHYLBENZENES*	622-96-8	90,079	52,578	0.58	0.24	25	TCEQ Long-Term AMCV Health	0.0095
UNDECANES	1120-21-4	90,079	52,578	0.06	0.02	55	TCEQ Long-Term AMCV Health	0.0004
XYLENES*	1330-20-7	90,079	52,578	2.32	0.94	23	EPA Inhalation RfCi	0.0410
							Hazard Index	0.5222

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.

Mobile Sampling Van Data Summary and Risk Assessment
Dupont Neighborhood | Q3 2021 - Q4 2023

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	126,970	85,345	0.08	0.03	0.95	EPA RSL Non-Cancer	0.0289
ACETYLENE	74-86-2	126,970	85,345	0.26	0.12	2500	TCEQ Long-Term AMCV Health	0.0000
BENZENE	71-43-2	126,970	85,345	0.43	0.25	3	ATSDR Chronic MRL	0.0819
BUTANES*	75-28-5	126,970	85,345	4.75	3.00	10000	TCEQ Long-Term AMCV Health	0.0003
BUTENES*	590-18-1	126,970	85,345	3.75	1.75	700	TCEQ Long-Term AMCV Health	0.0025
CARBON DISULFIDE	75-15-0	126,970	85,345	0.05	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	126,970	85,345	3.57	1.42	590	TCEQ Long-Term AMCV Health	0.0024
DECANES	124-18-5	126,970	85,345	0.20	0.04	190	TCEQ Long-Term AMCV Health	0.0002
DIETHYLBENZENES*	141-93-5	126,970	85,345	0.12	0.04	45	TCEQ Long-Term AMCV Health	0.0009
DIMETHYLCYCLOHEXANES*	638-04-0	126,970	85,345	0.07	0.03	400	CDPHE	0.0001
DODECANES	112-40-3	126,970	85,345	0.04	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	126,970	85,345	9.39	6.48	5300	TCEQ Long-Term AMCV Health	0.0012
HEPTANES*	142-82-5	126,970	85,345	0.12	0.06	98	EPA Inhalation RfCi	0.0006
HEXANES*	110-54-3	126,970	85,345	0.61	0.13	199	EPA Inhalation RfCi	0.0006
HEXENES*	592-41-6	126,970	85,345	1.86	0.80	50	TCEQ Long-Term AMCV Health	0.0159
HYDROGEN CYANIDE	74-90-8	126,970	85,345	0.79	0.20	0.75	EPA RSL Non-Cancer	0.2717
HYDROGEN SULFIDE	7783-06-4	126,970	85,345	0.47	0.13	1.4	EPA Inhalation RfCi	0.0911
ISOPRENE	78-79-5	126,970	85,345	0.72	0.17	140	TCEQ Long-Term AMCV Health	0.0012
METHANOL	67-56-1	126,970	85,345	11.51	4.10	15261	EPA Inhalation RfCi	0.0003
METHYLCYCLOHEXANE	108-87-2	126,970	85,345	0.09	0.05	400	TCEQ Long-Term AMCV Health	0.0001
NONANES	111-84-2	126,970	85,345	0.07	0.02	3.8	EPA Inhalation RfCi	0.0049
OCTANES*	111-65-9	126,970	85,345	0.08	0.04	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	126,970	85,345	1.54	0.84	339	EPA Inhalation RfCi	0.0025
PROPYLENE	115-07-1	126,970	85,345	0.51	0.18	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	126,970	85,345	0.17	0.05	235	EPA Inhalation RfCi	0.0002
TETRACHLOROETHYLENE	127-18-4	126,970	85,345	0.03	0.01	5.9	EPA Inhalation RfCi	0.0010
TOLUENE	108-88-3	126,970	85,345	1.47	0.60	1327	EPA Inhalation RfCi	0.0005
TRIMETHYLBENZENES*	622-96-8	126,970	85,345	0.32	0.12	25	TCEQ Long-Term AMCV Health	0.0048
UNDECANES	1120-21-4	126,970	85,345	0.08	0.02	55	TCEQ Long-Term AMCV Health	0.0004
XYLENES*	1330-20-7	126,970	85,345	1.02	0.50	23	EPA Inhalation RfCi	0.0219
							Hazard Index	0.5364

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.

Mobile Sampling Van Data Summary and Risk Assessment
Elyria-Swansea Neighborhood | Q3 2021 - Q4 2023

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	83,064	44,583	0.11	0.04	0.95	EPA RSL Non-Cancer	0.0393
ACETYLENE	74-86-2	83,064	44,583	0.33	0.18	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	83,064	44,583	0.48	0.27	3	ATSDR Chronic MRL	0.0891
BUTANES*	75-28-5	83,064	44,583	4.83	2.35	10000	TCEQ Long-Term AMCV Health	0.0002
BUTENES*	590-18-1	83,064	44,583	2.91	1.48	700	TCEQ Long-Term AMCV Health	0.0021
CARBON DISULFIDE	75-15-0	83,064	44,583	0.05	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	83,064	44,583	3.19	1.47	590	TCEQ Long-Term AMCV Health	0.0025
DECANES	124-18-5	83,064	44,583	0.09	0.04	190	TCEQ Long-Term AMCV Health	0.0002
DIETHYLBENZENES*	141-93-5	83,064	44,583	0.12	0.05	45	TCEQ Long-Term AMCV Health	0.0012
DIMETHYLCYCLOHEXANES*	638-04-0	83,064	44,583	0.07	0.03	400	CDPHE	0.0001
DODECANES	112-40-3	83,064	44,583	0.02	0.00	3.8	CDPHE	0.0003
ETHYLENE	74-85-1	83,064	44,583	10.19	7.41	5300	TCEQ Long-Term AMCV Health	0.0014
HEPTANES*	142-82-5	83,064	44,583	0.15	0.05	98	EPA Inhalation RfCi	0.0005
HEXANES*	110-54-3	83,064	44,583	0.31	0.14	199	EPA Inhalation RfCi	0.0007
HEXENES*	592-41-6	83,064	44,583	2.47	0.83	50	TCEQ Long-Term AMCV Health	0.0165
HYDROGEN CYANIDE	74-90-8	83,064	44,583	0.41	0.18	0.75	EPA RSL Non-Cancer	0.2344
HYDROGEN SULFIDE	7783-06-4	83,064	44,583	0.39	0.18	1.4	EPA Inhalation RfCi	0.1225
ISOPRENE	78-79-5	83,064	44,583	0.44	0.21	140	TCEQ Long-Term AMCV Health	0.0015
METHANOL	67-56-1	83,064	44,583	11.62	5.77	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	83,064	44,583	0.15	0.08	400	TCEQ Long-Term AMCV Health	0.0002
NONANES	111-84-2	83,064	44,583	0.06	0.02	3.8	EPA Inhalation RfCi	0.0055
OCTANES*	111-65-9	83,064	44,583	0.13	0.04	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	83,064	44,583	0.90	0.22	339	EPA Inhalation RfCi	0.0007
PROPYLENE	115-07-1	83,064	44,583	0.94	0.36	1801	EPA RSL Non-Cancer	0.0002
STYRENE	100-42-5	83,064	44,583	0.11	0.05	235	EPA Inhalation RfCi	0.0002
TETRACHLOROETHYLENE	127-18-4	83,064	44,583	0.14	0.01	5.9	EPA Inhalation RfCi	0.0025
TOLUENE	108-88-3	83,064	44,583	2.06	0.87	1327	EPA Inhalation RfCi	0.0007
TRIMETHYLBENZENES*	622-96-8	83,064	44,583	0.45	0.20	25	TCEQ Long-Term AMCV Health	0.0081
UNDECANES	1120-21-4	83,064	44,583	0.08	0.03	55	TCEQ Long-Term AMCV Health	0.0005
XYLENES*	1330-20-7	83,064	44,583	1.98	0.86	23	EPA Inhalation RfCi	0.0375
							Hazard Index	0.5691

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.

Mobile Sampling Van Data Summary and Risk Assessment
Globeville Neighborhood | Q3 2021 - Q4 2023

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	80,433	42,558	0.11	0.03	0.95	EPA RSL Non-Cancer	0.0326
ACETYLENE	74-86-2	80,433	42,558	0.39	0.16	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	80,433	42,558	0.63	0.30	3	ATSDR Chronic MRL	0.1004
BUTANES*	75-28-5	80,433	42,558	6.63	2.75	10000	TCEQ Long-Term AMCV Health	0.0003
BUTENES*	590-18-1	80,433	42,558	2.61	1.42	700	TCEQ Long-Term AMCV Health	0.0020
CARBON DISULFIDE	75-15-0	80,433	42,558	0.05	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	80,433	42,558	2.91	1.43	590	TCEQ Long-Term AMCV Health	0.0024
DECANES	124-18-5	80,433	42,558	0.15	0.06	190	TCEQ Long-Term AMCV Health	0.0003
DIETHYLBENZENES*	141-93-5	80,433	42,558	0.14	0.07	45	TCEQ Long-Term AMCV Health	0.0015
DIMETHYLCYCLOHEXANES*	638-04-0	80,433	42,558	0.06	0.03	400	CDPHE	0.0001
DODECANES	112-40-3	80,433	42,558	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	80,433	42,558	11.60	7.29	5300	TCEQ Long-Term AMCV Health	0.0014
HEPTANES*	142-82-5	80,433	42,558	0.24	0.07	98	EPA Inhalation RfCi	0.0007
HEXANES*	110-54-3	80,433	42,558	0.36	0.10	199	EPA Inhalation RfCi	0.0005
HEXENES*	592-41-6	80,433	42,558	2.00	0.76	50	TCEQ Long-Term AMCV Health	0.0152
HYDROGEN CYANIDE	74-90-8	80,433	42,558	0.25	0.12	0.75	EPA RSL Non-Cancer	0.1597
HYDROGEN SULFIDE	7783-06-4	80,433	42,558	0.26	0.15	1.4	EPA Inhalation RfCi	0.1052
ISOPRENE	78-79-5	80,433	42,558	0.44	0.23	140	TCEQ Long-Term AMCV Health	0.0017
METHANOL	67-56-1	80,433	42,558	9.63	5.98	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	80,433	42,558	0.13	0.07	400	TCEQ Long-Term AMCV Health	0.0002
NONANES	111-84-2	80,433	42,558	0.06	0.02	3.8	EPA Inhalation RfCi	0.0060
OCTANES*	111-65-9	80,433	42,558	0.12	0.05	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	80,433	42,558	0.35	0.15	339	EPA Inhalation RfCi	0.0004
PROPYLENE	115-07-1	80,433	42,558	1.28	0.48	1801	EPA RSL Non-Cancer	0.0003
STYRENE	100-42-5	80,433	42,558	0.11	0.05	235	EPA Inhalation RfCi	0.0002
TETRACHLOROETHYLENE	127-18-4	80,433	42,558	0.02	0.01	5.9	EPA Inhalation RfCi	0.0013
TOLUENE	108-88-3	80,433	42,558	6.31	0.98	1327	EPA Inhalation RfCi	0.0007
TRIMETHYLBENZENES*	622-96-8	80,433	42,558	0.49	0.18	25	TCEQ Long-Term AMCV Health	0.0073
UNDECANES	1120-21-4	80,433	42,558	0.08	0.03	55	TCEQ Long-Term AMCV Health	0.0006
XYLENES*	1330-20-7	80,433	42,558	2.02	0.85	23	EPA Inhalation RfCi	0.0370
							Hazard Index	0.4789

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.

Mobile Sampling Van Data Summary and Risk Assessment
Pioneer Park Neighborhood | Q3 2021 - Q4 2023

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	143,063	99,033	0.10	0.03	0.95	EPA RSL Non-Cancer	0.0339
ACETYLENE	74-86-2	143,063	99,033	0.40	0.14	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	143,063	99,033	0.41	0.20	3	ATSDR Chronic MRL	0.0680
BUTANES*	75-28-5	143,063	99,033	5.36	2.22	10000	TCEQ Long-Term AMCV Health	0.0002
BUTENES*	590-18-1	143,063	99,033	3.59	1.16	700	TCEQ Long-Term AMCV Health	0.0017
CARBON DISULFIDE	75-15-0	143,063	99,033	0.02	0.00	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	143,064	99,034	4.47	1.18	590	TCEQ Long-Term AMCV Health	0.0020
DECANES	124-18-5	143,063	99,033	0.32	0.09	190	TCEQ Long-Term AMCV Health	0.0005
DIETHYLBENZENES*	141-93-5	143,063	99,033	0.23	0.06	45	TCEQ Long-Term AMCV Health	0.0013
DIMETHYLCYCLOHEXANES*	638-04-0	143,063	99,033	0.06	0.02	400	CDPHE	0.0000
DODECANES	112-40-3	143,063	99,033	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	143,063	99,033	11.22	6.50	5300	TCEQ Long-Term AMCV Health	0.0012
HEPTANES*	142-82-5	143,063	99,033	0.21	0.10	98	EPA Inhalation RfCi	0.0010
HEXANES*	110-54-3	143,063	99,033	0.18	0.09	199	EPA Inhalation RfCi	0.0004
HEXENES*	592-41-6	143,063	99,033	1.66	0.56	50	TCEQ Long-Term AMCV Health	0.0112
HYDROGEN CYANIDE	74-90-8	143,063	99,033	0.41	0.15	0.75	EPA RSL Non-Cancer	0.1993
HYDROGEN SULFIDE	7783-06-4	143,063	99,033	0.41	0.18	1.4	EPA Inhalation RfCi	0.1231
ISOPRENE	78-79-5	143,063	99,033	0.58	0.19	140	TCEQ Long-Term AMCV Health	0.0014
METHANOL	67-56-1	143,063	99,033	11.54	4.02	15261	EPA Inhalation RfCi	0.0003
METHYLCYCLOHEXANE	108-87-2	143,063	99,033	0.10	0.04	400	TCEQ Long-Term AMCV Health	0.0001
NONANES	111-84-2	143,063	99,033	0.11	0.02	3.8	EPA Inhalation RfCi	0.0056
OCTANES*	111-65-9	143,063	99,033	0.26	0.05	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	143,063	99,033	0.32	0.18	339	EPA Inhalation RfCi	0.0005
PROPYLENE	115-07-1	143,063	99,033	0.64	0.24	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	143,063	99,033	1.57	0.07	235	EPA Inhalation RfCi	0.0003
TETRACHLOROETHYLENE	127-18-4	143,063	99,033	0.09	0.01	5.9	EPA Inhalation RfCi	0.0014
TOLUENE	108-88-3	143,063	99,033	1.72	0.49	1327	EPA Inhalation RfCi	0.0004
TRIMETHYLBENZENES*	622-96-8	143,063	99,033	0.41	0.13	25	TCEQ Long-Term AMCV Health	0.0051
UNDECANES	1120-21-4	143,063	99,033	0.08	0.03	55	TCEQ Long-Term AMCV Health	0.0005
XYLENES*	1330-20-7	143,063	99,033	1.31	0.63	23	EPA Inhalation RfCi	0.0273
							Hazard Index	0.4872

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.

Mobile Sampling Van Data Summary and Risk Assessment
Western Hills Neighborhood | Q3 2021 - Q4 2023

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	119,554	81,702	0.08	0.03	0.95	EPA RSL Non-Cancer	0.0311
ACETYLENE	74-86-2	119,554	81,702	0.36	0.17	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	119,554	81,702	0.49	0.24	3	ATSDR Chronic MRL	0.0811
BUTANES*	75-28-5	119,554	81,702	4.91	2.36	10000	TCEQ Long-Term AMCV Health	0.0002
BUTENES*	590-18-1	119,554	81,702	3.23	1.73	700	TCEQ Long-Term AMCV Health	0.0025
CARBON DISULFIDE	75-15-0	119,554	81,702	0.02	0.00	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	119,554	81,702	3.49	1.67	590	TCEQ Long-Term AMCV Health	0.0028
DECANES	124-18-5	119,554	81,702	0.11	0.04	190	TCEQ Long-Term AMCV Health	0.0002
DIETHYLBENZENES*	141-93-5	119,554	81,702	0.72	0.09	45	TCEQ Long-Term AMCV Health	0.0019
DIMETHYLCYCLOHEXANES*	638-04-0	119,554	81,702	0.15	0.06	400	CDPHE	0.0001
DODECANES	112-40-3	119,554	81,702	0.02	0.00	3.8	CDPHE	0.0004
ETHYLENE	74-85-1	119,554	81,702	12.13	6.79	5300	TCEQ Long-Term AMCV Health	0.0013
HEPTANES*	142-82-5	119,554	81,702	0.10	0.05	98	EPA Inhalation RfCi	0.0005
HEXANES*	110-54-3	119,554	81,702	0.18	0.08	199	EPA Inhalation RfCi	0.0004
HEXENES*	592-41-6	119,554	81,702	2.48	0.91	50	TCEQ Long-Term AMCV Health	0.0181
HYDROGEN CYANIDE	74-90-8	119,554	81,702	0.37	0.14	0.75	EPA RSL Non-Cancer	0.1907
HYDROGEN SULFIDE	7783-06-4	119,554	81,702	0.26	0.15	1.4	EPA Inhalation RfCi	0.1011
ISOPRENE	78-79-5	119,554	81,702	1.13	0.21	140	TCEQ Long-Term AMCV Health	0.0015
METHANOL	67-56-1	119,554	81,702	11.06	5.52	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	119,554	81,702	0.18	0.06	400	TCEQ Long-Term AMCV Health	0.0001
NONANES	111-84-2	119,554	81,702	0.05	0.02	3.8	EPA Inhalation RfCi	0.0048
OCTANES*	111-65-9	119,554	81,702	0.12	0.05	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	119,554	81,702	0.55	0.13	339	EPA Inhalation RfCi	0.0004
PROPYLENE	115-07-1	119,554	81,702	0.81	0.23	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	119,554	81,702	0.46	0.10	235	EPA Inhalation RfCi	0.0004
TETRACHLOROETHYLENE	127-18-4	119,554	81,702	0.12	0.01	5.9	EPA Inhalation RfCi	0.0020
TOLUENE	108-88-3	119,554	81,702	2.45	0.79	1327	EPA Inhalation RfCi	0.0006
TRIMETHYLBENZENES*	622-96-8	119,554	81,702	2.25	0.29	25	TCEQ Long-Term AMCV Health	0.0117
UNDECANES	1120-21-4	119,554	81,702	0.07	0.03	55	TCEQ Long-Term AMCV Health	0.0006
XYLENES*	1330-20-7	119,554	81,702	1.61	0.85	23	EPA Inhalation RfCi	0.0367
							Hazard Index	0.4919

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.