2022 Q1 MOBILE MONITORING VAN COMMERCE CITY NORTH DENVER COMMUNITY AIR MONITORING NETWORK COMMERCE CITY, COLORADO

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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 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). This report details approach number three, the periodic real-time air monitoring through six neighborhoods with the mobile monitoring van and a screening health risk analysis of the detected chemicals. Continuous real-time air monitoring and Summa canister sampling data are presented in separate reports.

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 select chemicals at sub-parts per billion (ppb) levels and as quickly as one measurement per second. During the monitoring period, the mobile monitoring van followed a dense route through each of the six CCND residential neighborhoods that fall within a three-mile radius around the refinery. Accessible streets in the monitored neighborhoods were traversed at approximately 10 miles per hour (MPH) while collecting a data point for each chemical every 1 second. During the first quarter 2022 sampling period (February 14 – February 18), the mobile monitoring van was in a total of six neighborhoods and collected over 74,900 data points across five days of monitoring, resulting in approximately 53,300, 1-hour rolling average concentrations. Meteorological conditions were also reported in real time.

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 estimated 1-hour maximum measured concentrations of individual or cumulative (combined) VOCs could potentially pose acute (short-term) health hazards. The air monitoring data and health risk assessment indicate:

- Air monitoring data and health risk assessment indicate all measured individual and combined air concentrations were below their respective acute health reference levels in all neighborhoods.
- Results indicate the measured concentrations are likely to be without any appreciable risk of adverse acute health effects, even for sensitive sub-populations.

[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.

1.0 INTRODUCTION

In response to feedback received by Suncor Energy (U.S.A.) Inc. (Suncor) through community engagement conducted in the fall of 2020, 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 collection and laboratory analysis for the presence of specific VOCs from Summa canisters; and (3) periodic real-time air monitoring throughout neighborhoods using a mobile monitoring van to detect the 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. This report details approach number three. The continuous real-time community air monitoring and Summa canister sampling data are presented in separate reports. Air monitoring, sampling, and analysis from approaches (1) and (2) were conducted in accordance with the Quality Assurance Project Plan (QAPP) that can be found online at ccnd-air.com/documents.

2.0 MOBILE SAMPLING PROGRAM

2.1 Mobile Van Air Sampling Description

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 other incorporated meteorological (MET) sensors.

During the mobile monitoring program, the list of 65 chemicals in Table 2-1 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 1 second. The details of the monitored neighborhoods are listed in Table 2-2 and are shown in Figure 2-1.

TABLE 2-1
MOBILE MONITORING VAN PROGRAM CHEMICALS[2]

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

[2] See Appendix A for isomer analysis details

TABLE 2-2
NEIGHBORHOOD MONITORING PROGRAM DETAILS

Neighborhood	Area (square miles)	Sampling Date	Start Time	End Time	Total Data Points Collected	Total Hourly Rolling Averages Calculated
Adams City	0.41	02/16/22	09:39	12:44	11,262	7,663
Dupont	1.4	02/14/22	10:08	14:20	15,152	11,553
Elyria-Swansea	1.2	02/18/22	11:43	14:51	11,282	7,683
Globeville	0.44	02/15/22	14:11	16:14	7,365	3,766
Pioneer Park	1.7	02/17/22	11:12	15:18	14,767	11,186
Western Hills	1.6	02/15/22	09:29	13:40	15,074	11,475

2.2 Mobile Monitoring Van Air Sampling Methods

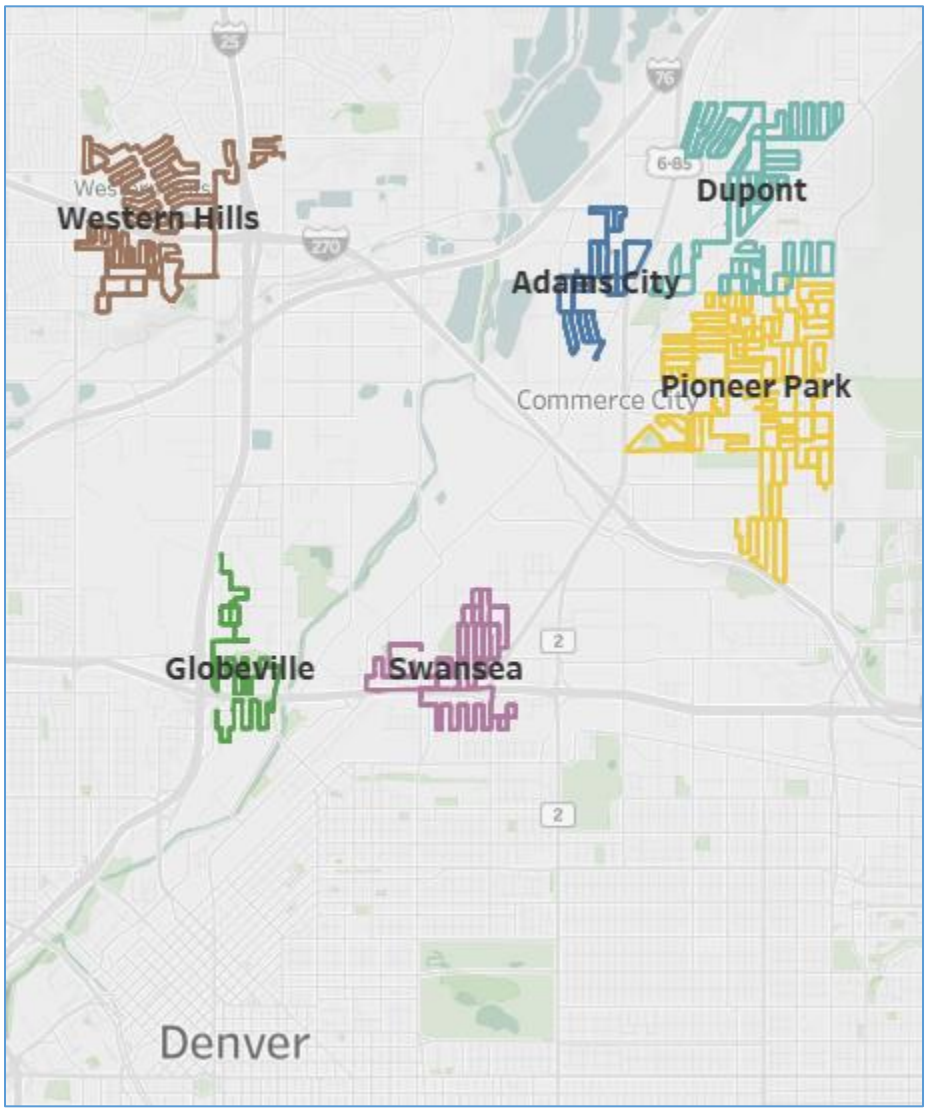
The PTR-TOF-MS calibration was checked and the instrument was zeroed each day prior to collection of any ambient air data. The instrument was calibrated using United States Environmental Protection Agency (USEPA) protocol certified calibration gases. The multi-chemical cylinder standards were used to 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 2-1. 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. See the attached Appendix D for specific PTR-TOF-MS instrument operation conditions.

FIGURE 2-1
MOBILE MONITORING VAN PROGRAM ROUTE THROUGH SIX NEIGHBORHOOD AREAS



2.3 Screening Health Risk Assessment Methods

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 acute (short-term) health impacts. 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 are calculated and evaluated multiple times. In most cases, risk assessors cannot know exactly the level of chemical exposure experienced by individuals or communities. Therefore, the first tier involves use of exposure assumptions that are health-conservative. This means that data reflecting maximum

exposure potential are plugged into the risk calculations. These are worst-case scenarios that typically represent exposure conditions higher than would be reasonably expected. Such calculations are very simple and assume a person is constantly exposed to the highest one hour rolling average concentration for each detected chemical. If the resulting risk values indicate the lack of likely acute adverse health effects under these worst-case conditions, then the risk assessment is complete. However, if the risk values suggest a potential for acute 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 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 cumulative set of chemical(s) being higher than its 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.

The screening-level risk assessment reported here includes calculated acute risks from exposure to individually measured chemicals as well as exposure to all measured chemicals at once (cumulative). For individual chemicals, an acute health risk value was calculated as the exposure concentration (EC) divided by the chemical-specific federal or state established acute RL (Equation 1). The result is referred to as the hazard quotient (HQ). Estimates of EC were derived from 1-hour rolling average concentrations of each chemical for the entire measurement time in an individual CCND neighborhood. The RLs used to calculate the HQs are previously established exposure levels below which no adverse effect in humans is expected. If available, RLs adopted by the Colorado Department of Public Health and Environment (CDPHE) were selected for use within this assessment and include ATSDR acute minimum risk levels (MRL), California EPA Office of Environmental Health Hazard Assessment (OEHHA) acute risk levels, and Texas Commission on Environmental Quality (TCEQ) acute exposure guideline levels. If the chemical was not listed by CDPHE, a federal and state recommended hierarchy for selection of RLs was used[4]. For chemical isomer groups which were unable to be differentiated the lowest, most health-protective RL of the isomer group was selected for use in this assessment.

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

[4] https://drive.google.com/file/d/1P2KEvu0MFiyzQAOQtjQUclqR-WGh1bEX/view

Acute HQs were calculated as follows:

Eq. 1 – Hazard Quotient (HQ) Equation

HQ= EC/ RL

Where:

HQ= Hazard Quotient

EC= Maximum 1-hour rolling average air concentration

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

Health risks from potential cumulative exposures to all detected chemicals were calculated by adding together each individual chemical's HQ calculated for a given neighborhood. The sum of all the individual HQs is called a Hazard Index (HI). Adding together all the HQs is also a very health-conservative approach because it assumes that all the measured chemicals exert an adverse effect on the body in a similar manner, which is rarely the case.

An 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 acute health effects, even for sensitive sub-populations. The potential for adverse health effects increases as HQ or HI increase above one, but it is not known by how much. 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*."[5] 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 acute exposure to benzene as 10,200 parts per billion (ppb), based on a study of mice exposed six hours per day for six days. ATSDR then applied a combined safety factor of 300 to derive the final RL to account for several uncertainties, including differences between mice and humans and for sensitive individuals. Therefore, it is scientifically incorrect to assume that all real-world exposures to a chemical at levels higher than a RL will likely result in an adverse effect.

Using the maximum 1-hour rolling average for the EC conservatively assumes that a hypothetical maximally exposed individual occupies the monitored neighborhood and breathes the maximum 1-hour detected concentration continuously for an hour up to multiple days (an acute exposure). A 1-hour average concentration is more appropriate than a 1-second or 1-minute concentration for use in an acute health risk assessment. This is because 1-second exposures to the chemicals measured in this study do not cause adverse effects unless the levels are extremely high (i.e., tens of thousands to millions of ppb). Guidance values for use in emergency situations with extremely elevated levels of these chemicals are available and are discussed below. Across all neighborhoods, more than 74,900 1-hour rolling averages of chemical concentrations were calculated to derive the estimated ECs (Table 2-2). The range between the average and maximum rolling 1-hour average values provides a robust estimate of plausible outdoor

[5] https://www.atsdr.cdc.gov/mrls/index.html#:~:text=ATSDR%20uses%20the%20no%20observed,to%20such%20substance%2Dinduced%20effects.

exposures of persons occupying the monitored neighborhood while the mobile monitoring van was present (Figures 3-1 to 3-8).

The USEPA also has established values for use in emergency situations, termed Acute Exposure Guideline Levels (AEGLs). Unlike RLs that can be thousands of times below exposure levels where adverse effects are observed, AEGL values are levels at which different acute adverse health effects may be anticipated to occur. According to USEPA, "*AEGL-1 represent exposure levels that could produce mild and progressively increasing but transient and non-disabling odor, taste, and sensory irritation or certain asymptomatic, non-sensory effects. With increasing airborne concentration above each AEGL, there is a progressive increase in the likelihood of occurrence and the severity of effects described for each corresponding AEGL [i.e., AEGL-2 or AEGL-3].*"[6] The AEGL-1 60-minute value, if available for the applicable chemical, was also used for comparison purposes because it is more precautionary (than AEGL-2 or AEGL-3) as the AEGL-1 level reflects protecting against acute health effects that are reversible upon cessation of exposure.

3.0 SUMMARY AND DISCUSSION OF RESULTS

3.1 Summary of Mobile Monitoring Van Results

A summary of mobile monitoring van results by neighborhood can be found in Table 2-2. Over five days, six neighborhoods were monitored for 64 chemicals, collecting more than 74,000 total data points. Individual neighborhood results are detailed in Figures 3-1 through 3-6. Each figure shows a map of the monitoring locations within each neighborhood, the chemicals that resulted in the top five calculated acute HQs and time profiles of the measured levels of these chemicals. The time profiles show all the 1-second data (orange) and calculated 1-hour rolling averages (green) of the monitoring data. Each green 1-hour average data point shown in these profiles reflects all the 1-second measurements collected over the previous hour. Thus, 1-hour rolling average values are shown on the time profiles only after one hour of data collection (Figure 3-1 through 3-6).

Wind roses for each sampling day are provided in Appendix B. The data used to derive the wind roses were collected from the CCND community sensor location most local to the neighborhood being monitored on each day because the stationary source of MET data is more reliable than the MET station on the mobile monitoring van when the lab is moving.

3.2 Screening Health Risk Assessment Results

Acute health risks were calculated for each neighborhood. According to USEPA guidelines, an acute HQ or HI less than or equal to one (1) indicates that exposures are likely to be without any acute adverse health effects, even for sensitive sub-populations.

Maximum 1-hour rolling average concentrations for 65 chemicals measured in each neighborhood were compared to acute RLs to derive HQs. Figures 3-1 through 3-6 show concentrations of chemicals over the sampling time and summaries of results for chemicals resulting in the five highest HQs by neighborhood (if available). The estimated HI values (if available) shown in Figures 3-1 through 3-6 were calculated by summing the HQs of all detected chemicals measured

[6] https://www.epa.gov/aegl/about-acute-exposure-guideline-levels-aegls

in a given neighborhood. The graphs in these figures indicate whether a maximum HQ was ever greater than one (yellow dots) or less than one (green dots) for any measured chemical. If any measured chemical resulted in a HQ greater than 1, then a separate figure would be shown for that chemical alone. Complete results for HQs for all chemicals detected in each neighborhood are available in Appendix C.

In conclusion, the data collected during this study phase did not indicate a potential for acute adverse health effects from exposure to the measured chemicals, both individually and combined.

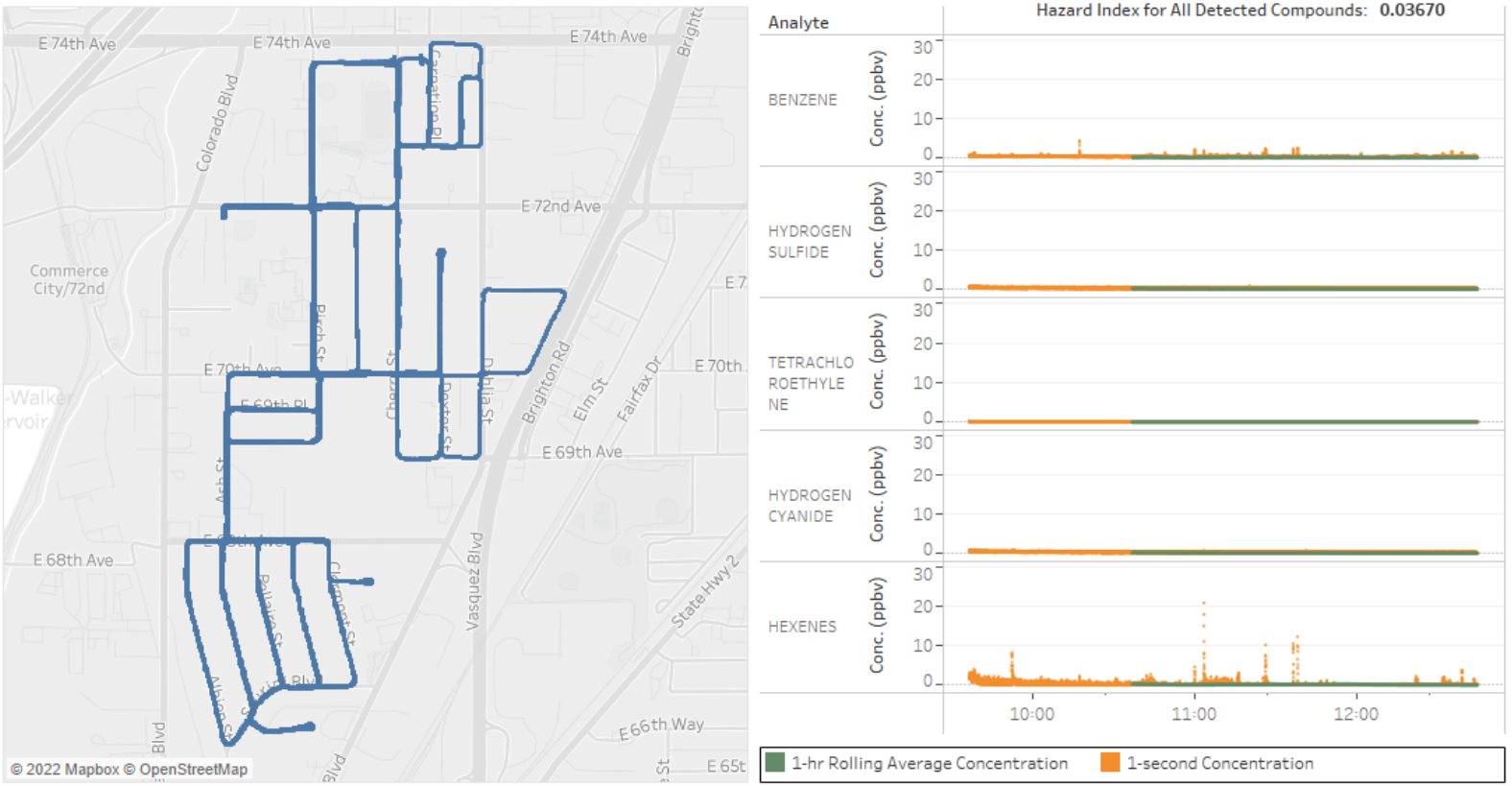
- All HQs were less than one for all detected chemicals, indicating that the maximum 1-hour rolling average concentration for each chemical was below its respective acute RL in all six neighborhoods (Figure 3-1 through 3-6).

- In this quarter, benzene, tetrachloroethylene, hydrogen sulfide, hexenes, hydrogen cyanide, toluene, and diethylbenzenes were the chemicals resulting in the highest HQ in each neighborhood, accounting for over 80% of the total calculated HI value. However, all HI values calculated in all six neighborhoods were below one (Figures 3-1 through 3-6).

- These results indicate that the measured concentrations of chemicals, both individually and cumulative (combined), are likely to be without an appreciable risk of acute adverse health effects, even for sensitive sub-populations.

FIGURE 3-1
ADAMS CITY NEIGHBORHOOD: FEBRUARY 16, 2022

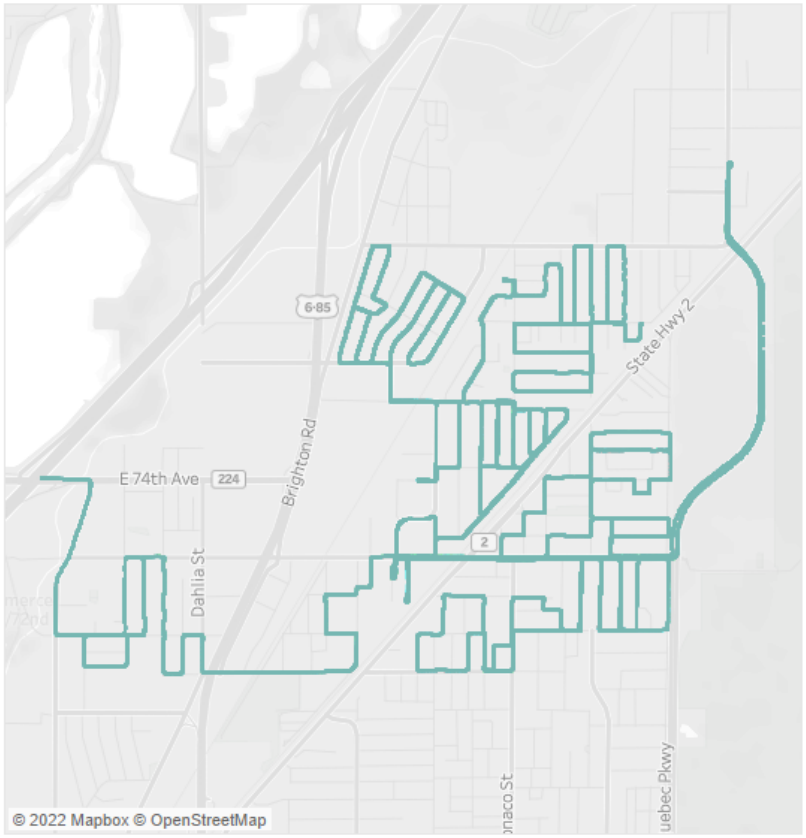
Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Acute Health Reference Level (ppbv)	Hazard Quotient
BENZENE	4.25	7,663	0.23	0.20	52,000	9	0.02571
HYDROGEN SULFIDE	0.85	7,663	0.27	0.18	510	70	0.00386
TETRACHLOROETHYLENE	0.25	7,663	0.02	0.02	35,000	6	0.00352
HYDROGEN CYANIDE	0.88	7,663	0.30	0.18	2,000	308	0.00098
HEXENES	20.78	7,663	0.33	0.13	NR	500	0.00065



The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes.

FIGURE 3-2
DUPONT NEIGHBORHOOD: FEBRUARY 14, 2022

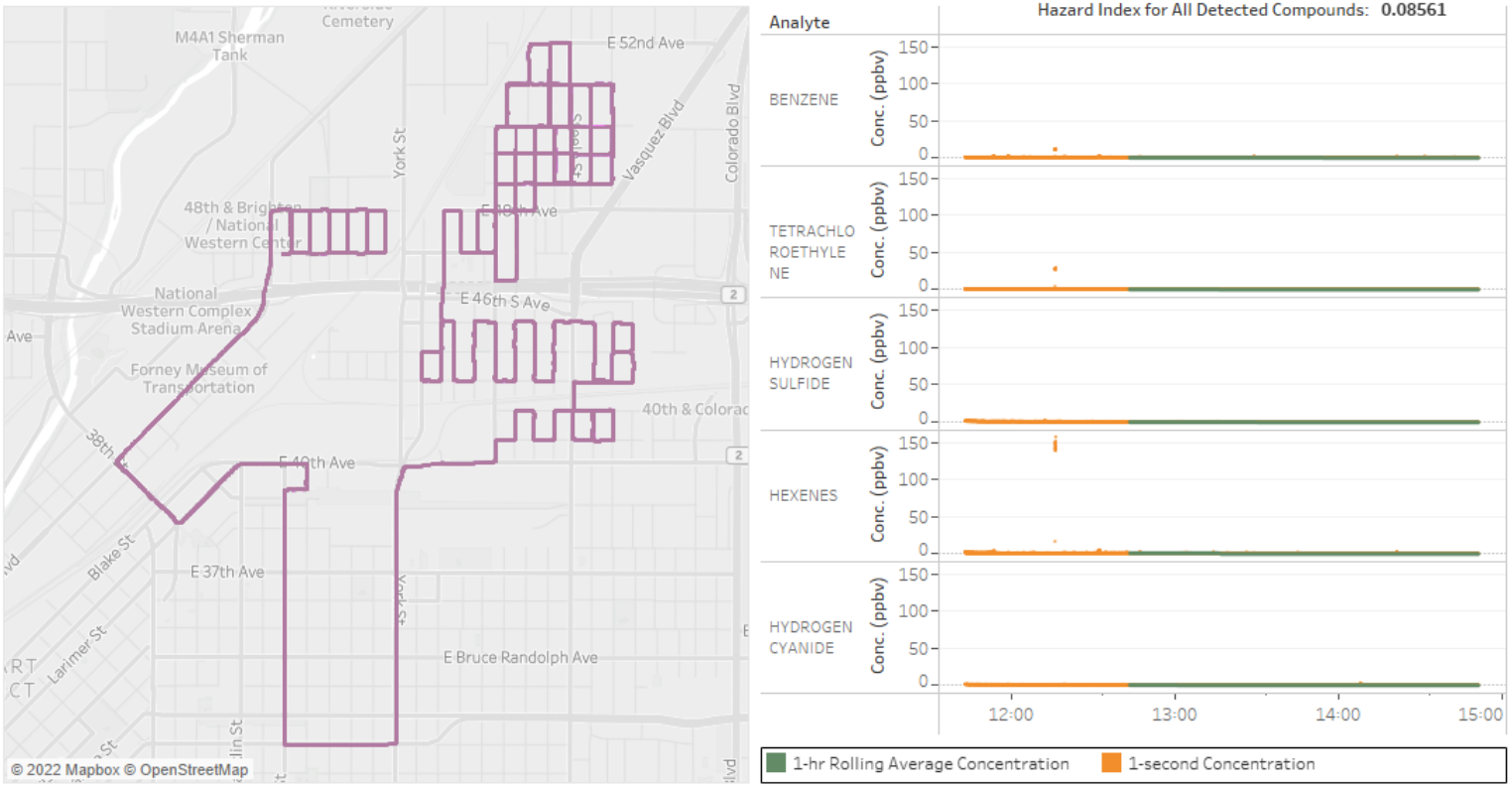
Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Acute Health Reference Level (ppbv)	Hazard Quotient
BENZENE	7.38	11,553	0.30	0.25	52,000	9	0.03369
HEXENES	24.08	11,553	1.39	1.06	NR	500	0.00279
HYDROGEN CYANIDE	2.82	11,553	0.79	0.34	2,000	308	0.00256
TETRACHLOROETHYLENE	0.20	11,553	0.01	0.01	35,000	6	0.00191
HYDROGEN SULFIDE	0.57	11,553	0.09	0.03	510	70	0.00129



The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes.

FIGURE 3-3
ELYRA-SWANSEA NEIGHBORHOOD: FEBRUARY 18, 2022

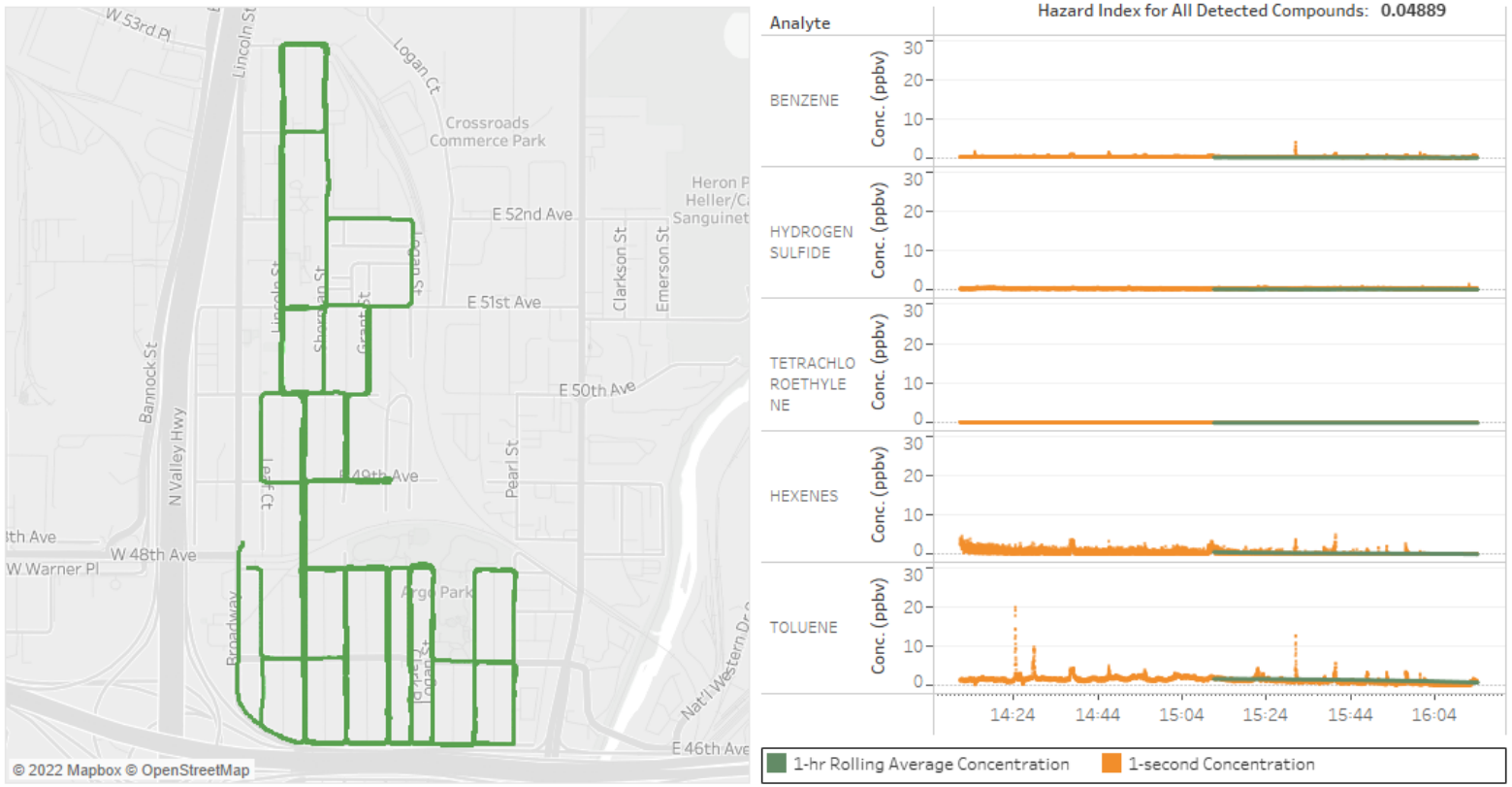
Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Acute Health Reference Level (ppbv)	Hazard Quotient
BENZENE	11.63	7,683	0.45	0.34	52,000	9	0.04992
TETRACHLOROETHYLENE	28.99	7,683	0.14	0.04	35,000	6	0.02392
HYDROGEN SULFIDE	1.20	7,683	0.39	0.21	510	70	0.00554
HEXENES	156.71	7,683	0.92	0.24	NR	500	0.00184
HYDROGEN CYANIDE	2.51	7,683	0.41	0.22	2,000	308	0.00133



The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes.

FIGURE 3-4
GLOBEVILLE NEIGHBORHOOD: FEBRUARY 15, 2022

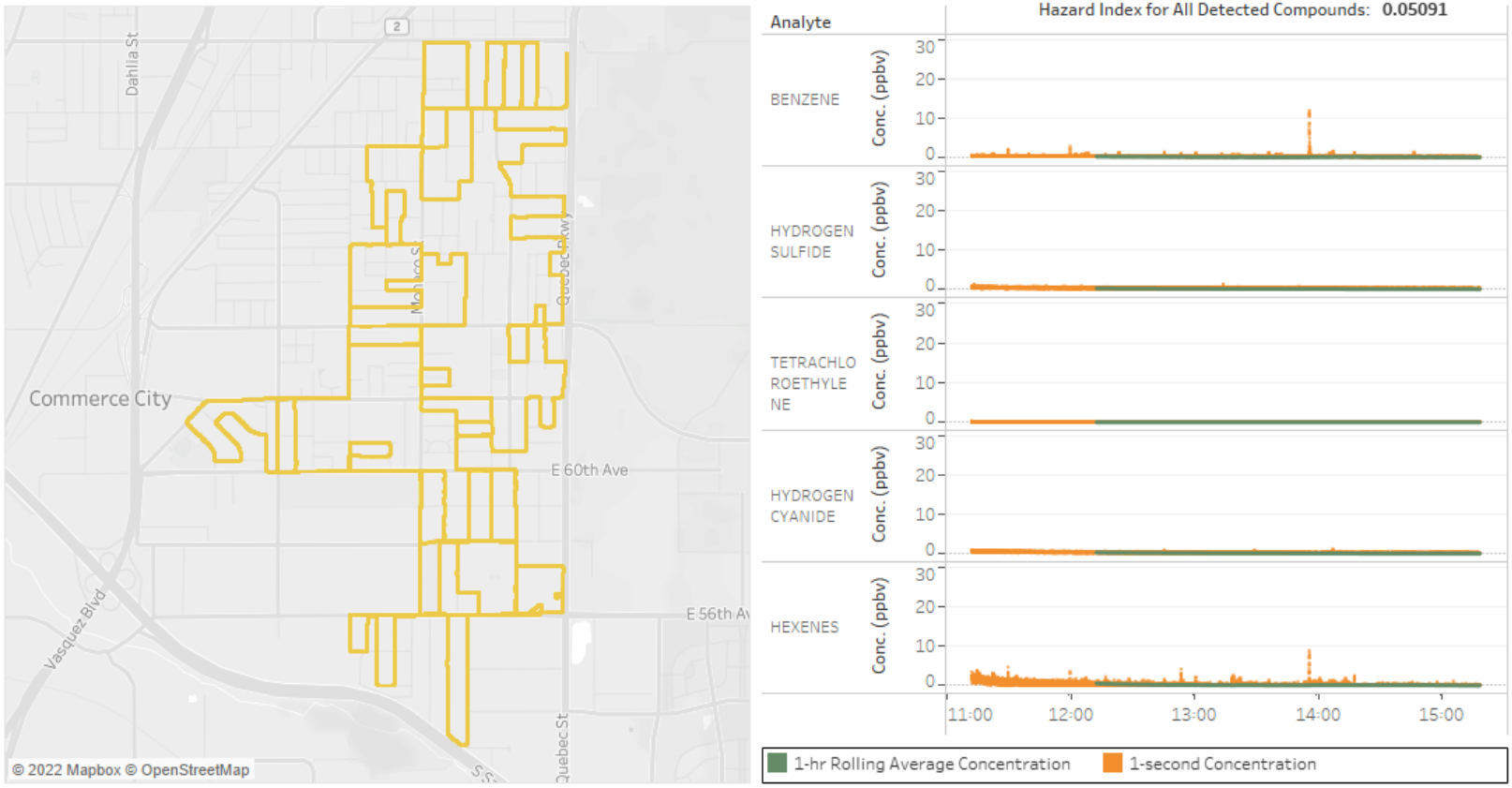
Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Acute Health Reference Level (ppbv)	Hazard Quotient
BENZENE	4.03	3,766	0.34	0.31	52,000	9	0.03801
HYDROGEN SULFIDE	1.36	3,766	0.22	0.21	510	70	0.00315
TETRACHLOROETHYLENE	0.08	3,766	0.02	0.02	35,000	6	0.00310
HEXENES	4.88	3,766	0.59	0.28	NR	500	0.00117
TOLUENE	19.85	3,766	1.76	1.45	67,000	2,000	0.00088



The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes.

FIGURE 3-5
PIONEER PARK NEIGHBORHOOD: FEBRUARY 17, 2022

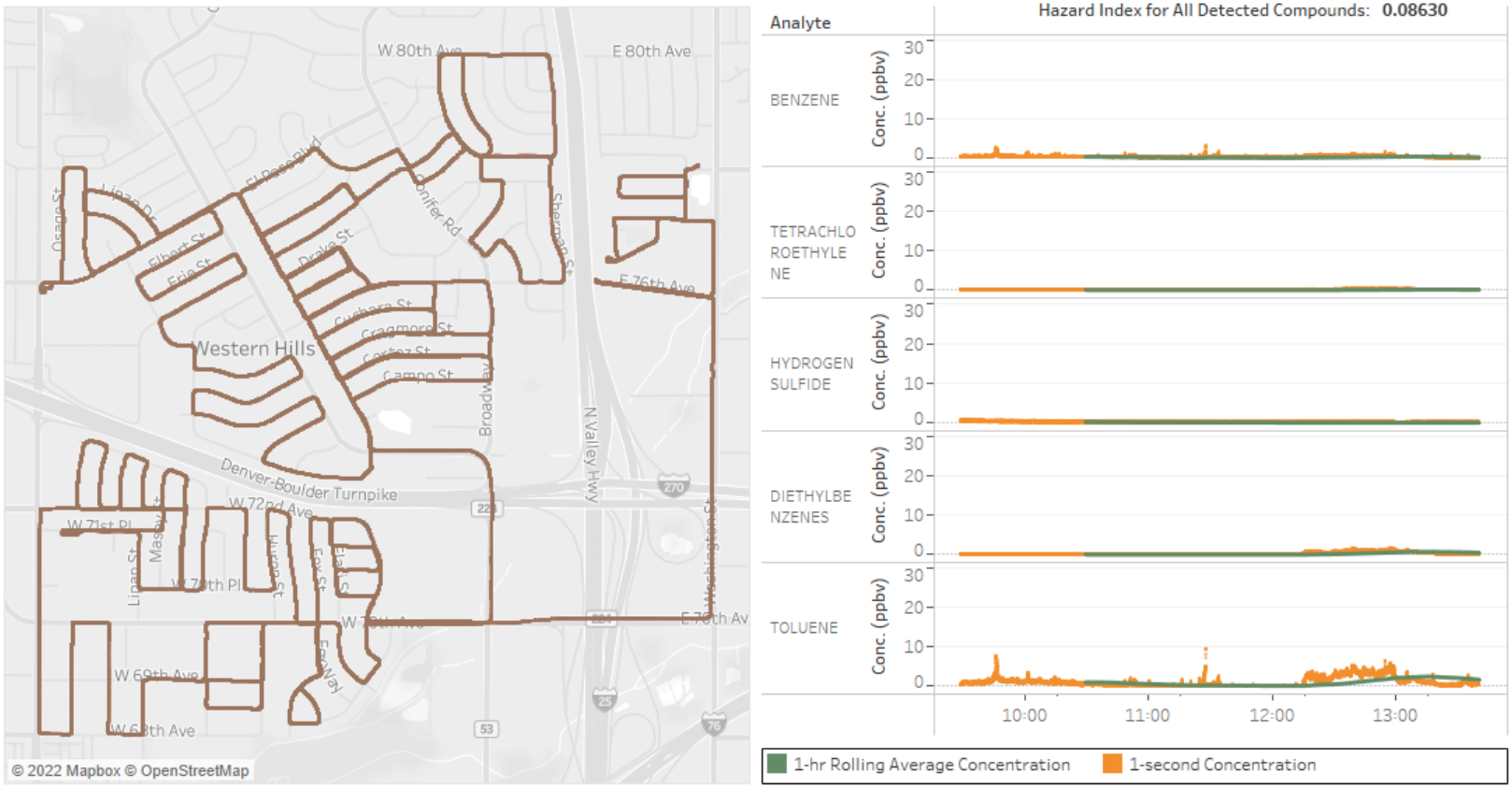
Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Acute Health Reference Level (ppbv)	Hazard Quotient
BENZENE	11.93	11,168	0.35	0.23	52,000	9	0.03920
HYDROGEN SULFIDE	1.19	11,168	0.28	0.14	510	70	0.00396
TETRACHLOROETHYLENE	0.25	11,168	0.02	0.01	35,000	6	0.00304
HYDROGEN CYANIDE	1.07	11,168	0.36	0.17	2,000	308	0.00117
HEXENES	8.76	11,168	0.56	0.12	NR	500	0.00111



The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes.

FIGURE 3-6
WESTERN HILLS NEIGHBORHOOD: FEBRUARY 15, 2022

Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	3.22	11,475	0.49	0.31	52,000	9	0.05500
TETRACHLOROETHYLENE	0.34	11,475	0.12	0.03	35,000	6	0.01959
HYDROGEN SULFIDE	0.82	11,475	0.24	0.11	510	70	0.00348
DIETHYLBENZENES	1.62	11,475	0.72	0.19	NR	450	0.00160
TOLUENE	9.45	11,475	2.45	0.90	67,000	2,000	0.00122



The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes.

3.3 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 acute hazard estimates presented in this assessment are estimates of risk due to a number of assumptions about exposure and toxicity. This screening-level risk assessment relied on a combination of health-protective exposure scenarios and input values (i.e., high-end exposures and conservative selection of lowest reference value per isomer). Because of these assumptions, the estimates of acute hazards are themselves uncertain but likely to be over-estimates of actual risk.

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.

3.4 Program Changes

No program changes occurred during this reporting period.

Respectfully Submitted:

Steven Yuchs, PhD.
Vice President, Technical
Ambient & Emerging Technology
Montrose Air Quality Services

Michael Lumpkin, PhD, DABT
Senior Toxicologist
CTEH®, LLC

APPENDIX A
ISOMER CHEMICAL SAMPLING DETAILS

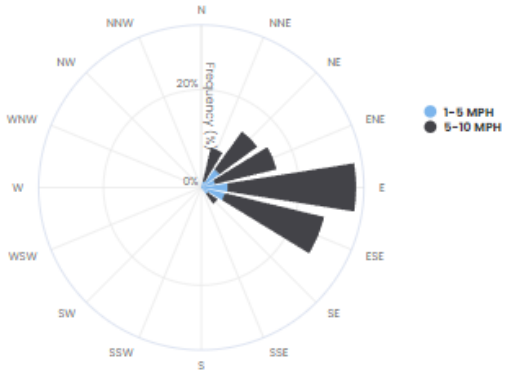
In a real-time PTR-TOF analysis, it is not possible to speciate isomers, or chemical compounds that have the same molecular weight. For example, n-hexane, 2-methyl pentane, and 2,2-dimethyl butane all have a molecular mass of 86.178 g/mol. In order to provide the most conservative determination of concentration 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.

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

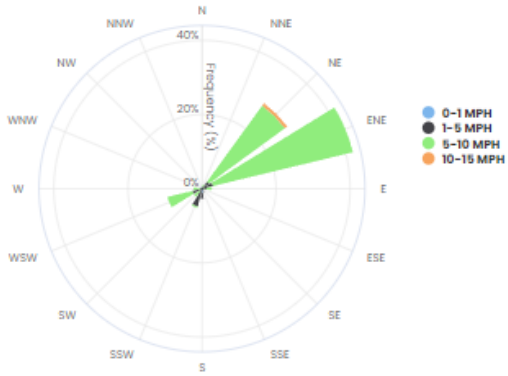
Group Name	Specific Isomers
Xylenes	Ethyl Benzene
	o-Xylene
	m-Xylene
	p-Xylene
Dimethylcyclohexanes	Ethylcyclohexane
	cis-1,3-Dimethylcyclohexane
	trans-1,2-Dimethylcyclohexane
	trans-1,3-Dimethylcyclohexane
Octanes	n-Octane
	2-Methylheptane
	3-Methylheptane
	2,2,4-Trimethylpentane
	2,3,4-Trimethylpentane
Trimethylbenzenes	Cumene
	1,2,4-Trimethylbenzene
	o-Ethyltoluene
	m-Ethyltoluene
	p-Ethyltoluene
	n-Propylbenzene
Diethylbenzenes	o-Diethylbenzene
	m-Diethylbenzene
	p-Diethylbenzene

APPENDIX B
DAILY WIND ROSES

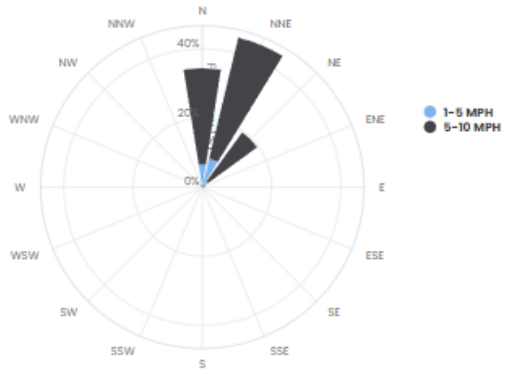
Wind Rose | CM4 (Adams City Middle School) 9:00am – 1:00pm, February 16, 2022



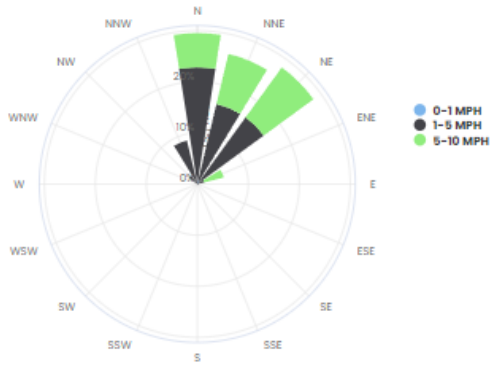
Wind Rose | CM3 (Adams City High School) 10:00am – 2:30pm, February 14, 2022



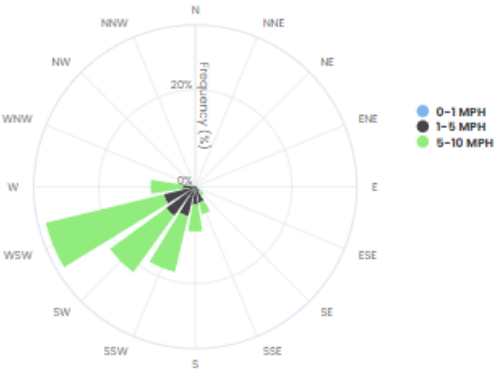
Wind Rose | CM6 (Focus Points Family Resource Center) 11:30am – 3:00pm, February 18, 2022



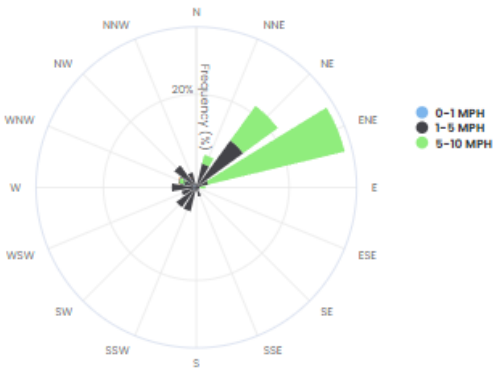
Wind Rose | CM6 (Focus Points Family Resource Center) 2:00pm – 4:30pm, February 15, 2022



Wind Rose | CM7 (Kearney Elementary School) 11:00am – 3:30pm, February 17, 2022



Wind Rose | CM4 (Adams City Middle School) 9:00am – 2:00pm, February 15, 2022



APPENDIX C
SCREENING RISK ASSESSMENT DETAILS
(ALPHABETICAL ORDER BY NEIGHBORHOOD NAME)

CCND Mobile Monitoring Van
2022 Q1

Mobile Laboratory Sampling Data Summary And Risk Assessment

Adams City Neighborhood | February 16, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	11,262	0.21	7,663	0.05	0.06	670,000	298	OEHHA Acute REL	0.00019
ACETYLENE	74-86-2	11,262	0.91	7,663	0.14	0.21	NR	25,000	TCEQ Short-Term AMCV Health	0.00001
BENZENE	71-43-2	11,262	4.25	7,663	0.20	0.23	52,000	9	ATSDR Acute MRL	0.02571
BUTANES	106-97-8	11,262	7.27	7,663	0.43	0.68	5,500,000	92,000	TCEQ Short-Term AMCV Health	0.00001
BUTENES	106-98-9	11,262	35.12	7,663	0.70	1.25	NR	27,000	TCEQ Short-Term AMCV Health	0.00005
CARBON DISULFIDE	75-15-0	11,262	0.07	7,663	0.01	0.01	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANE	287-92-3	11,262	55.60	7,663	0.29	0.48	NR	5,900	TCEQ Short-Term AMCV Health	0.00008
DECANES	124-18-5	11,262	0.12	7,663	0.02	0.03	NR	1,000	TCEQ Short-Term AMCV Health	0.00003
DIETHYLBENZENES	141-93-5	11,262	0.14	7,663	0.02	0.03	NR	450	TCEQ Short-Term AMCV Health	0.00007
DIMETHYLCYCLOHEXANES	590-66-9	11,262	0.24	7,663	0.02	0.03	NR	NA	NE	
DODECANES	112-40-3	11,262	0.02	7,663	0.00	0.00	NR	NA	NE	
ETHYLENE	74-85-1	11,262	9.01	7,663	6.98	7.05	NR	500,000	TCEQ Short-Term AMCV Health	0.00001
HEPTANES	142-82-5	11,262	0.13	7,663	0.00	0.01	NR	8,300	TCEQ Short-Term AMCV Health	0.00000
HEXANES	110-54-3	11,262	0.36	7,663	0.04	0.05	NR	5,400	TCEQ Short-Term AMCV Health	0.00001
HEXENES	592-41-6	11,262	20.78	7,663	0.13	0.33	NR	500	TCEQ Short-Term AMCV Health	0.00065
HYDROGEN CYANIDE	74-90-8	11,262	0.88	7,663	0.18	0.30	2,000	308	OEHHA Acute REL	0.00098
HYDROGEN SULFIDE	7783-06-4	11,262	0.85	7,663	0.18	0.27	510	70	ATSDR Acute MRL	0.00386
ISOPRENE	78-79-5	11,262	1.95	7,663	0.15	0.20	NR	1,400	TCEQ Short-Term AMCV Health	0.00014
METHANOL	67-56-1	11,262	194.42	7,663	8.25	9.58	530,000	21,366	OEHHA Acute REL	0.00045
METHYLCYCLOHEXANE	108-87-2	11,262	0.33	7,663	0.03	0.05	NR	4,000	TCEQ Short-Term AMCV Health	0.00001
NONANES	111-84-2	11,262	0.07	7,663	0.01	0.02	NR	3,000	TCEQ Short-Term AMCV Health	0.00001
OCTANES	111-65-9	11,262	0.13	7,663	0.02	0.03	NR	4,100	TCEQ Short-Term AMCV Health	0.00001
PENTANES	109-66-0	11,262	0.18	7,663	0.03	0.03	NR	68,000	TCEQ Short-Term AMCV Health	0.00000
PROPYLENE	115-07-1	11,262	2.61	7,663	0.10	0.20	NR	NA	NE	
STYRENE	100-42-5	11,262	0.35	7,663	0.05	0.09	20,000	5,000	ATSDR Acute MRL	0.00002
TETRACHLOROETHYLENE	127-18-4	11,262	0.25	7,663	0.02	0.02	35,000	6	ATSDR Acute MRL	0.00352
TOLUENE	108-88-3	11,262	15.15	7,663	0.58	0.77	67,000	2,000	ATSDR Acute MRL	0.00039
TRIMETHYLBENZENES	526-73-8	11,262	1.12	7,663	0.18	0.26	NR	3,000	TCEQ Short-Term AMCV Health	0.00009
UNDECANES	1120-21-4	11,262	0.10	7,663	0.02	0.03	NR	550	TCEQ Short-Term AMCV Health	0.00005
XYLENES	1330-20-7	11,262	10.27	7,663	0.55	0.67	130,000	2,000	ATSDR Acute MRL	0.00033
									Hazard Index	**0.03670**

NR = According to EPA, AEGL is "not recommended due to insufficient data"
NA = Not Available
NC = Not Calculated

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"

CCND Mobile Monitoring Van
2022 Q1

Mobile Laboratory Sampling Data Summary And Risk Assessment

Dupont Neighborhood | February 14, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	15,152	0.19	11,553	0.05	0.05	670,000	298	OEHHA Acute REL	0.00018
ACETYLENE	74-86-2	15,152	1.00	11,553	0.13	0.21	NR	25,000	TCEQ Short-Term AMCV Health	0.00001
BENZENE	71-43-2	15,152	7.38	11,553	0.25	0.30	52,000	9	ATSDR Acute MRL	0.03369
BUTANES	106-97-8	15,152	18.72	11,553	4.51	4.75	5,500,000	92,000	TCEQ Short-Term AMCV Health	0.00005
BUTENES	106-98-9	15,152	33.44	11,553	1.51	1.88	NR	27,000	TCEQ Short-Term AMCV Health	0.00007
CARBON DISULFIDE	75-15-0	15,152	0.06	11,553	0.01	0.02	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANE	287-92-3	15,152	25.62	11,553	1.71	2.17	NR	5,900	TCEQ Short-Term AMCV Health	0.00037
DECANES	124-18-5	15,152	0.07	11,553	0.03	0.03	NR	1,000	TCEQ Short-Term AMCV Health	0.00003
DIETHYLBENZENES	141-93-5	15,152	0.10	11,553	0.00	0.00	NR	450	TCEQ Short-Term AMCV Health	0.00001
DIMETHYLCYCLOHEXANES	590-66-9	15,152	0.10	11,553	0.03	0.03	NR	NA	NE	
DODECANES	112-40-3	15,152	0.03	11,553	0.00	0.00	NR	NA	NE	
ETHYLENE	74-85-1	15,152	43.85	11,553	9.16	9.39	NR	500,000	TCEQ Short-Term AMCV Health	0.00002
HEPTANES	142-82-5	15,152	0.13	11,553	0.04	0.04	NR	8,300	TCEQ Short-Term AMCV Health	0.00000
HEXANES	110-54-3	15,152	0.87	11,553	0.60	0.61	NR	5,400	TCEQ Short-Term AMCV Health	0.00011
HEXENES	592-41-6	15,152	24.08	11,553	1.06	1.39	NR	500	TCEQ Short-Term AMCV Health	0.00279
HYDROGEN CYANIDE	74-90-8	15,152	2.82	11,553	0.34	0.79	2,000	308	OEHHA Acute REL	0.00256
HYDROGEN SULFIDE	7783-06-4	15,152	0.57	11,553	0.03	0.09	510	70	ATSDR Acute MRL	0.00129
ISOPRENE	78-79-5	15,152	1.65	11,553	0.22	0.25	NR	1,400	TCEQ Short-Term AMCV Health	0.00018
METHANOL	67-56-1	15,152	94.76	11,553	5.82	6.78	530,000	21,366	OEHHA Acute REL	0.00032
METHYLCYCLOHEXANE	108-87-2	15,152	0.31	11,553	0.06	0.06	NR	4,000	TCEQ Short-Term AMCV Health	0.00002
NONANES	111-84-2	15,152	0.07	11,553	0.02	0.02	NR	3,000	TCEQ Short-Term AMCV Health	0.00001
OCTANES	111-65-9	15,152	0.11	11,553	0.03	0.04	NR	4,100	TCEQ Short-Term AMCV Health	0.00001
PENTANES	109-66-0	15,152	1.79	11,553	1.54	1.54	NR	68,000	TCEQ Short-Term AMCV Health	0.00002
PROPYLENE	115-07-1	15,152	14.95	11,553	0.29	0.34	NR	NA	NE	
STYRENE	100-42-5	15,152	0.33	11,553	0.01	0.02	20,000	5,000	ATSDR Acute MRL	0.00000
TETRACHLOROETHYLENE	127-18-4	15,152	0.20	11,553	0.01	0.01	35,000	6	ATSDR Acute MRL	0.00191
TOLUENE	108-88-3	15,152	22.30	11,553	1.16	1.47	67,000	2,000	ATSDR Acute MRL	0.00073
TRIMETHYLBENZENES	526-73-8	15,152	3.50	11,553	0.06	0.11	NR	3,000	TCEQ Short-Term AMCV Health	0.00004
UNDECANES	1120-21-4	15,152	0.05	11,553	0.01	0.01	NR	550	TCEQ Short-Term AMCV Health	0.00003
XYLENES	1330-20-7	15,152	17.41	11,553	0.23	0.39	130,000	2,000	ATSDR Acute MRL	0.00019
									Hazard Index	0.04464

NR = According to EPA, AEGL is "not recommended due to insufficient data"
NA = Not Available
NC = Not Calculated

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"

CCND Mobile Monitoring Van
2022 Q1

Mobile Laboratory Sampling Data Summary And Risk Assessment

Elyria-Swansea Neighborhood | February 18, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	11,282	3.30	7,683	0.09	0.11	670,000	298	OEHHA Acute REL	0.00035
ACETYLENE	74-86-2	11,282	8.09	7,683	0.22	0.33	NR	25,000	TCEQ Short-Term AMCV Health	0.00001
BENZENE	71-43-2	11,282	11.63	7,683	0.34	0.45	52,000	9	ATSDR Acute MRL	0.04992
BUTANES	106-97-8	11,282	39.14	7,683	2.27	2.55	5,500,000	92,000	TCEQ Short-Term AMCV Health	0.00003
BUTENES	106-98-9	11,282	8.38	7,683	0.69	1.09	NR	27,000	TCEQ Short-Term AMCV Health	0.00004
CARBON DISULFIDE	75-15-0	11,282	7.74	7,683	0.01	0.05	13,000	1,991	OEHHA Acute REL	0.00002
CYCLOPENTANE	287-92-3	11,282	141.79	7,683	0.64	1.68	NR	5,900	TCEQ Short-Term AMCV Health	0.00028
DECANES	124-18-5	11,282	5.81	7,683	0.03	0.07	NR	1,000	TCEQ Short-Term AMCV Health	0.00007
DIETHYLBENZENES	141-93-5	11,282	5.94	7,683	0.01	0.03	NR	450	TCEQ Short-Term AMCV Health	0.00007
DIMETHYLCYCLOHEXANES	590-66-9	11,282	3.97	7,683	0.04	0.06	NR	NA	NE	
DODECANES	112-40-3	11,282	3.16	7,683	0.00	0.02	NR	NA	NE	
ETHYLENE	74-85-1	11,282	12.48	7,683	7.86	7.96	NR	500,000	TCEQ Short-Term AMCV Health	0.00002
HEPTANES	142-82-5	11,282	6.56	7,683	0.06	0.09	NR	8,300	TCEQ Short-Term AMCV Health	0.00001
HEXANES	110-54-3	11,282	6.97	7,683	0.06	0.10	NR	5,400	TCEQ Short-Term AMCV Health	0.00002
HEXENES	592-41-6	11,282	156.71	7,683	0.24	0.92	NR	500	TCEQ Short-Term AMCV Health	0.00184
HYDROGEN CYANIDE	74-90-8	11,282	2.51	7,683	0.22	0.41	2,000	308	OEHHA Acute REL	0.00133
HYDROGEN SULFIDE	7783-06-4	11,282	1.20	7,683	0.21	0.39	510	70	ATSDR Acute MRL	0.00554
ISOPRENE	78-79-5	11,282	8.47	7,683	0.11	0.22	NR	1,400	TCEQ Short-Term AMCV Health	0.00016
METHANOL	67-56-1	11,282	198.20	7,683	6.83	10.67	530,000	21,366	OEHHA Acute REL	0.00050
METHYLCYCLOHEXANE	108-87-2	11,282	6.56	7,683	0.08	0.12	NR	4,000	TCEQ Short-Term AMCV Health	0.00003
NONANES	111-84-2	11,282	5.64	7,683	0.01	0.03	NR	3,000	TCEQ Short-Term AMCV Health	0.00001
OCTANES	111-65-9	11,282	5.92	7,683	0.05	0.13	NR	4,100	TCEQ Short-Term AMCV Health	0.00003
PENTANES	109-66-0	11,282	8.70	7,683	0.02	0.06	NR	68,000	TCEQ Short-Term AMCV Health	0.00000
PROPYLENE	115-07-1	11,282	16.06	7,683	0.28	0.50	NR	NA	NE	
STYRENE	100-42-5	11,282	5.97	7,683	0.01	0.05	20,000	5,000	ATSDR Acute MRL	0.00001
TETRACHLOROETHYLENE	127-18-4	11,282	28.99	7,683	0.04	0.14	35,000	6	ATSDR Acute MRL	0.02392
TOLUENE	108-88-3	11,282	18.00	7,683	1.26	1.85	67,000	2,000	ATSDR Acute MRL	0.00092
TRIMETHYLBENZENES	526-73-8	11,282	13.10	7,683	0.04	0.14	NR	3,000	TCEQ Short-Term AMCV Health	0.00005
UNDECANES	1120-21-4	11,282	5.87	7,683	0.01	0.03	NR	550	TCEQ Short-Term AMCV Health	0.00005
XYLENES	1330-20-7	11,282	25.86	7,683	0.34	0.74	130,000	2,000	ATSDR Acute MRL	0.00037
									Hazard Index	**0.08561**

NR = According to EPA, AEGL is "not recommended due to insufficient data"
NA = Not Available
NC = Not Calculated

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"

CCND Mobile Monitoring Van
2022 Q1

Mobile Laboratory Sampling Data Summary And Risk Assessment

Globeville Neighborhood | February 15, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	7,365	0.26	3,766	0.09	0.09	670,000	298	OEHHA Acute REL	0.00030
ACETYLENE	74-86-2	7,365	0.91	3,766	0.20	0.22	NR	25,000	TCEQ Short-Term AMCV Health	0.00001
BENZENE	71-43-2	7,365	4.03	3,766	0.31	0.34	52,000	9	ATSDR Acute MRL	0.03801
BUTANES	106-97-8	7,365	51.00	3,766	1.92	2.21	5,500,000	92,000	TCEQ Short-Term AMCV Health	0.00002
BUTENES	106-98-9	7,365	10.93	3,766	1.01	1.61	NR	27,000	TCEQ Short-Term AMCV Health	0.00006
CARBON DISULFIDE	75-15-0	7,365	0.15	3,766	0.04	0.05	13,000	1,991	OEHHA Acute REL	0.00002
CYCLOPENTANE	287-92-3	7,365	11.13	3,766	0.70	1.21	NR	5,900	TCEQ Short-Term AMCV Health	0.00020
DECANES	124-18-5	7,365	0.17	3,766	0.05	0.06	NR	1,000	TCEQ Short-Term AMCV Health	0.00006
DIETHYLBENZENES	141-93-5	7,365	0.27	3,766	0.05	0.07	NR	450	TCEQ Short-Term AMCV Health	0.00015
DIMETHYLCYCLOHEXANES	590-66-9	7,365	0.13	3,766	0.04	0.05	NR	NA	NE	
DODECANES	112-40-3	7,365	0.01	3,766	0.00	0.00	NR	NA	NE	
ETHYLENE	74-85-1	7,365	10.25	3,766	9.25	9.28	NR	500,000	TCEQ Short-Term AMCV Health	0.00002
HEPTANES	142-82-5	7,365	0.12	3,766	0.02	0.02	NR	8,300	TCEQ Short-Term AMCV Health	0.00000
HEXANES	110-54-3	7,365	0.15	3,766	0.04	0.04	NR	5,400	TCEQ Short-Term AMCV Health	0.00001
HEXENES	592-41-6	7,365	4.88	3,766	0.28	0.59	NR	500	TCEQ Short-Term AMCV Health	0.00117
HYDROGEN CYANIDE	74-90-8	7,365	0.82	3,766	0.13	0.17	2,000	308	OEHHA Acute REL	0.00057
HYDROGEN SULFIDE	7783-06-4	7,365	1.36	3,766	0.21	0.22	510	70	ATSDR Acute MRL	0.00315
ISOPRENE	78-79-5	7,365	0.63	3,766	0.27	0.32	NR	1,400	TCEQ Short-Term AMCV Health	0.00023
METHANOL	67-56-1	7,365	97.68	3,766	8.86	9.63	530,000	21,366	OEHHA Acute REL	0.00045
METHYLCYCLOHEXANE	108-87-2	7,365	0.29	3,766	0.09	0.10	NR	4,000	TCEQ Short-Term AMCV Health	0.00002
NONANES	111-84-2	7,365	0.07	3,766	0.03	0.03	NR	3,000	TCEQ Short-Term AMCV Health	0.00001
OCTANES	111-65-9	7,365	0.67	3,766	0.06	0.07	NR	4,100	TCEQ Short-Term AMCV Health	0.00002
PENTANES	109-66-0	7,365	0.07	3,766	0.03	0.03	NR	68,000	TCEQ Short-Term AMCV Health	0.00000
PROPYLENE	115-07-1	7,365	3.46	3,766	0.27	0.36	NR	NA	NE	
STYRENE	100-42-5	7,365	2.54	3,766	0.00	0.01	20,000	5,000	ATSDR Acute MRL	0.00000
TETRACHLOROETHYLENE	127-18-4	7,365	0.08	3,766	0.02	0.02	35,000	6	ATSDR Acute MRL	0.00310
TOLUENE	108-88-3	7,365	19.85	3,766	1.45	1.76	67,000	2,000	ATSDR Acute MRL	0.00088
TRIMETHYLBENZENES	526-73-8	7,365	1.77	3,766	0.02	0.03	NR	3,000	TCEQ Short-Term AMCV Health	0.00001
UNDECANES	1120-21-4	7,365	0.16	3,766	0.05	0.06	NR	550	TCEQ Short-Term AMCV Health	0.00011
XYLENES	1330-20-7	7,365	18.91	3,766	0.41	0.59	130,000	2,000	ATSDR Acute MRL	0.00029
									Hazard Index	**0.04889**

NR = According to EPA, AEGL is "not recommended due to insufficient data"
NA = Not Available
NC = Not Calculated

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"

CCND Mobile Monitoring Van
2022 Q1

Mobile Laboratory Sampling Data Summary And Risk Assessment

Pioneer Park Neighborhood | February 17, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	14,767	0.23	11,168	0.06	0.07	670,000	298	OEHHA Acute REL	0.00025
ACETYLENE	74-86-2	14,767	0.91	11,168	0.12	0.19	NR	25,000	TCEQ Short-Term AMCV Health	0.00001
BENZENE	71-43-2	14,767	11.93	11,168	0.23	0.35	52,000	9	ATSDR Acute MRL	0.03920
BUTANES	106-97-8	14,767	352.42	11,168	1.85	3.11	5,500,000	92,000	TCEQ Short-Term AMCV Health	0.00003
BUTENES	106-98-9	14,767	18.72	11,168	0.38	1.05	NR	27,000	TCEQ Short-Term AMCV Health	0.00004
CARBON DISULFIDE	75-15-0	14,767	0.08	11,168	0.01	0.01	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANE	287-92-3	14,767	11.85	11,168	0.40	1.12	NR	5,900	TCEQ Short-Term AMCV Health	0.00019
DECANES	124-18-5	14,767	0.12	11,168	0.03	0.04	NR	1,000	TCEQ Short-Term AMCV Health	0.00004
DIETHYLBENZENES	141-93-5	14,767	0.14	11,168	0.02	0.03	NR	450	TCEQ Short-Term AMCV Health	0.00007
DIMETHYLCYCLOHEXANES	590-66-9	14,767	0.10	11,168	0.02	0.03	NR	NA	NE	
DODECANES	112-40-3	14,767	0.03	11,168	0.00	0.00	NR	NA	NE	
ETHYLENE	74-85-1	14,767	10.75	11,168	10.07	10.14	NR	500,000	TCEQ Short-Term AMCV Health	0.00002
HEPTANES	142-82-5	14,767	0.11	11,168	0.03	0.05	NR	8,300	TCEQ Short-Term AMCV Health	0.00001
HEXANES	110-54-3	14,767	0.11	11,168	0.03	0.04	NR	5,400	TCEQ Short-Term AMCV Health	0.00001
HEXENES	592-41-6	14,767	8.76	11,168	0.12	0.56	NR	500	TCEQ Short-Term AMCV Health	0.00111
HYDROGEN CYANIDE	74-90-8	14,767	1.07	11,168	0.17	0.36	2,000	308	OEHHA Acute REL	0.00117
HYDROGEN SULFIDE	7783-06-4	14,767	1.19	11,168	0.14	0.28	510	70	ATSDR Acute MRL	0.00396
ISOPRENE	78-79-5	14,767	0.78	11,168	0.18	0.25	NR	1,400	TCEQ Short-Term AMCV Health	0.00018
METHANOL	67-56-1	14,767	367.52	11,168	5.80	11.54	530,000	21,366	OEHHA Acute REL	0.00054
METHYLCYCLOHEXANE	108-87-2	14,767	0.13	11,168	0.04	0.05	NR	4,000	TCEQ Short-Term AMCV Health	0.00001
NONANES	111-84-2	14,767	0.08	11,168	0.02	0.02	NR	3,000	TCEQ Short-Term AMCV Health	0.00001
OCTANES	111-65-9	14,767	0.26	11,168	0.03	0.04	NR	4,100	TCEQ Short-Term AMCV Health	0.00001
PENTANES	109-66-0	14,767	0.13	11,168	0.09	0.10	NR	68,000	TCEQ Short-Term AMCV Health	0.00000
PROPYLENE	115-07-1	14,767	2.89	11,168	0.21	0.34	NR	NA	NE	
STYRENE	100-42-5	14,767	0.49	11,168	0.06	0.10	20,000	5,000	ATSDR Acute MRL	0.00002
TETRACHLOROETHYLENE	127-18-4	14,767	0.25	11,168	0.01	0.02	35,000	6	ATSDR Acute MRL	0.00304
TOLUENE	108-88-3	14,767	9.93	11,168	0.35	0.80	67,000	2,000	ATSDR Acute MRL	0.00040
TRIMETHYLBENZENES	526-73-8	14,767	0.93	11,168	0.08	0.21	NR	3,000	TCEQ Short-Term AMCV Health	0.00007
UNDECANES	1120-21-4	14,767	0.10	11,168	0.02	0.03	NR	550	TCEQ Short-Term AMCV Health	0.00006
XYLENES	1330-20-7	14,767	6.52	11,168	0.43	0.92	130,000	2,000	ATSDR Acute MRL	0.00046
									Hazard Index	**0.05091**

NR = According to EPA, AEGL is "not recommended due to insufficient data"
NA = Not Available
NC = Not Calculated

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"

CCND Mobile Monitoring Van
2022 Q1

Mobile Laboratory Sampling Data Summary And Risk Assessment

Western Hills Neighborhood | February 15, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	15,074	3.41	11,475	0.06	0.07	670,000	298	OEHHA Acute REL	0.00025
ACETYLENE	74-86-2	15,074	1.13	11,475	0.24	0.36	NR	25,000	TCEQ Short-Term AMCV Health	0.00001
BENZENE	71-43-2	15,074	3.22	11,475	0.31	0.49	52,000	9	ATSDR Acute MRL	0.05500
BUTANES	106-97-8	15,074	15.26	11,475	1.58	2.89	5,500,000	92,000	TCEQ Short-Term AMCV Health	0.00003
BUTENES	106-98-9	15,074	31.44	11,475	0.29	0.51	NR	27,000	TCEQ Short-Term AMCV Health	0.00002
CARBON DISULFIDE	75-15-0	15,074	0.08	11,475	0.01	0.02	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANE	287-92-3	15,074	17.75	11,475	0.30	0.72	NR	5,900	TCEQ Short-Term AMCV Health	0.00012
DECANES	124-18-5	15,074	0.20	11,475	0.02	0.07	NR	1,000	TCEQ Short-Term AMCV Health	0.00007
DIETHYLBENZENES	141-93-5	15,074	1.62	11,475	0.19	0.72	NR	450	TCEQ Short-Term AMCV Health	0.00160
DIMETHYLCYCLOHEXANES	590-66-9	15,074	0.27	11,475	0.03	0.11	NR	NA	NE	
DODECANES	112-40-3	15,074	0.01	11,475	0.00	0.00	NR	NA	NE	
ETHYLENE	74-85-1	15,074	10.72	11,475	8.16	8.24	NR	500,000	TCEQ Short-Term AMCV Health	0.00002
HEPTANES	142-82-5	15,074	0.13	11,475	0.02	0.04	NR	8,300	TCEQ Short-Term AMCV Health	0.00000
HEXANES	110-54-3	15,074	0.17	11,475	0.04	0.07	NR	5,400	TCEQ Short-Term AMCV Health	0.00001
HEXENES	592-41-6	15,074	4.56	11,475	0.12	0.26	NR	500	TCEQ Short-Term AMCV Health	0.00052
HYDROGEN CYANIDE	74-90-8	15,074	3.89	11,475	0.11	0.37	2,000	308	OEHHA Acute REL	0.00119
HYDROGEN SULFIDE	7783-06-4	15,074	0.82	11,475	0.11	0.24	510	70	ATSDR Acute MRL	0.00348
ISOPRENE	78-79-5	15,074	2.69	11,475	0.30	1.13	NR	1,400	TCEQ Short-Term AMCV Health	0.00081
METHANOL	67-56-1	15,074	52.19	11,475	8.94	11.06	530,000	21,366	OEHHA Acute REL	0.00052
METHYLCYCLOHEXANE	108-87-2	15,074	0.45	11,475	0.05	0.18	NR	4,000	TCEQ Short-Term AMCV Health	0.00004
NONANES	111-84-2	15,074	0.11	11,475	0.02	0.03	NR	3,000	TCEQ Short-Term AMCV Health	0.00001
OCTANES	111-65-9	15,074	0.47	11,475	0.02	0.10	NR	4,100	TCEQ Short-Term AMCV Health	0.00003
PENTANES	109-66-0	15,074	0.26	11,475	0.04	0.04	NR	68,000	TCEQ Short-Term AMCV Health	0.00000
PROPYLENE	115-07-1	15,074	18.61	11,475	0.27	0.81	NR	NA	NE	
STYRENE	100-42-5	15,074	3.07	11,475	0.12	0.46	20,000	5,000	ATSDR Acute MRL	0.00009
TETRACHLOROETHYLENE	127-18-4	15,074	0.34	11,475	0.03	0.12	35,000	6	ATSDR Acute MRL	0.01959
TOLUENE	108-88-3	15,074	9.45	11,475	0.90	2.45	67,000	2,000	ATSDR Acute MRL	0.00122
TRIMETHYLBENZENES	526-73-8	15,074	5.90	11,475	0.62	2.25	NR	3,000	TCEQ Short-Term AMCV Health	0.00075
UNDECANES	1120-21-4	15,074	0.16	11,475	0.02	0.07	NR	550	TCEQ Short-Term AMCV Health	0.00013
XYLENES	1330-20-7	15,074	10.11	11,475	0.46	1.57	130,000	2,000	ATSDR Acute MRL	0.00079
									Hazard Index	**0.08630**

NR = According to EPA, AEGL is "not recommended due to insufficient data"
NA = Not Available
NC = Not Calculated

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"

APPENDIX D
CALIBRATION AND QA/QC DATA

Instrument Calibration Check						
Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
2/14/2022	8:26	Ethylene	50	49	-2.0	Pass
		Propylene	50	55.9	11.8	Pass
		1-Butene	50	50.2	0.4	Pass
		1-Pentene	50	52.3	4.6	Pass
		1-Hexene	50	51.7	3.4	Pass
		1,3-Butadiene	50	52.5	5.0	Pass
	8:36	Benzene	100	99.9	-0.1	Pass
		Toluene	100	102	2.0	Pass
		Xylenes	200	204	2.0	Pass
	8:46	Benzene	10	9.53	-4.7	Pass
		Toluene	10	10.3	3.0	Pass
		Xylenes	20	18.6	-7.0	Pass
	8:52	HCN	25	26.8	7.2	Pass
	9:00	H_2S	100	101	1.0	Pass
			20	18.9	-5.5	Pass
	9:08	Propane	150	158	5.3	Pass
		Butane	150	142	-5.3	Pass
		Pentane	150	142	-5.3	Pass
		Hexane	150	138	-8.0	Pass
		Heptane	150	144	-4.0	Pass
	16:16	HCN	25	25.7	2.8	Pass
	15:26	H2S	20	22.5	12.5	Pass
	15:12	Propane	150	160	6.7	Pass
		Butane	150	142	-5.3	Pass
		Pentane	150	149	-0.7	Pass
		Hexane	150	146	-2.7	Pass
		Heptane	150	148	-1.3	Pass
	15:16	Benzene	100	99.2	-0.8	Pass
		Toluene	100	103	3.0	Pass
		Xylenes	200	201	0.5	Pass
	15:19	Ethylene	50	48	-4.0	Pass
		Propylene	50	52	4.0	Pass
		1-Butene	50	48	-4.0	Pass
		1-Pentene	50	53	6.0	Pass
		1-Hexene	50	49	-2.0	Pass
		1,3-Butadiene	50	51	2.0	Pass

Instrument Calibration Check						
Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
2/15/2022	8:18	Ethylene	50	52.7	5.4	Pass
		Propylene	50	56.1	12.2	Pass
		1-Butene	50	50.3	0.6	Pass
		1-Pentene	50	54.2	8.4	Pass
		1-Hexene	50	51.5	3.0	Pass
		1,3-Butadiene	50	53.3	6.6	Pass
	8:23	Benzene	100	97	-3.0	Pass
		Toluene	100	107	7.0	Pass
		Xylenes	200	204	2.0	Pass
	8:33	Benzene	10	9.46	-5.4	Pass
		Toluene	10	9.97	-0.3	Pass
		Xylenes	20	18.9	-5.5	Pass
	8:37	HCN	25	24.7	-1.2	Pass
	8:42	H_2S	125	114	-8.8	Pass
	8:48	H2S	20	18.6	-7.0	Pass
	8:52	Propane	150	163	8.7	Pass
		Butane	150	143	-4.7	Pass
		Pentane	150	147	-2.0	Pass
		Hexane	150	143	-4.7	Pass
		Heptane	150	148	-1.3	Pass
	16:47	HCN	25	27.3	9.2	Pass
	17:04	H2S	20	18.9	-5.5	Pass
	16:45	Propane	150	155	3.3	Pass
		Butane	150	135	-10.0	Pass
		Pentane	150	141	-6.0	Pass
		Hexane	150	142	-5.3	Pass
		Heptane	150	147	-2.0	Pass
	16:50	Benzene	100	102	2.0	Pass
		Toluene	100	110	10.0	Pass
		Xylenes	200	212	6.0	Pass
	17:07	Ethylene	50	48.7	-2.6	Pass
		Propylene	50	54.1	8.2	Pass
		1-Butene	50	47.4	-5.2	Pass
		1-Pentene	50	50	0.0	Pass
		1-Hexene	50	51	2.0	Pass
		1,3-Butadiene	50	52.8	5.6	Pass

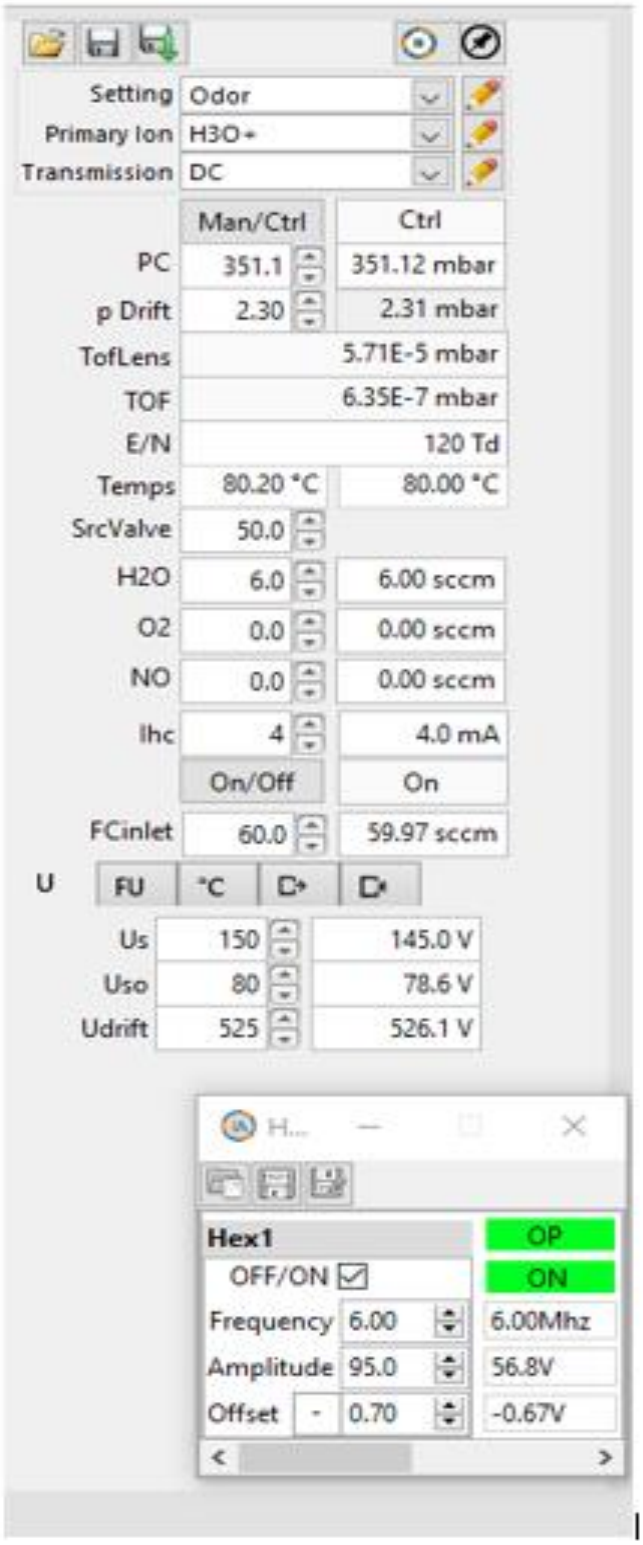
Instrument Calibration Check						
Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
2/16/2022	8:40	Ethylene	50	44.6	-10.8	Pass
		Propylene	50	51.6	3.2	Pass
		1-Butene	50	46.8	-6.4	Pass
		1-Pentene	50	47.6	-4.8	Pass
		1-Hexene	50	46.9	-6.2	Pass
		1,3-Butadiene	50	51.8	3.6	Pass
	8:15	Benzene	100	98.7	-1.3	Pass
		Toluene	100	103	3.0	Pass
		Xylenes	200	190	-5.0	Pass
	8:24	Benzene	10	9.51	-4.9	Pass
		Toluene	10	9.78	-2.2	Pass
		Xylenes	20	18.2	-9.0	Pass
	8:37	HCN	25	23.9	-4.4	Pass
	8:47	H_2S	100	104	4.0	Pass
	8:48		20	19.5	-2.5	Pass
	8:12	Propane	150	151	0.7	Pass
		Butane	150	138	-8.0	Pass
		Pentane	150	141	-6.0	Pass
		Hexane	150	142	-5.3	Pass
		Heptane	150	144	-4.0	Pass
	13:35	HCN	25	26.4	5.6	Pass
	13:45	H2S	100	96.3	-3.7	Pass
	13:36	Propane	150	146	-2.7	Pass
		Butane	150	136	-9.3	Pass
		Pentane	150	139	-7.3	Pass
		Hexane	150	139	-7.3	Pass
		Heptane	150	141	-6.0	Pass
	13:39	Benzene	100	99.4	-0.6	Pass
		Toluene	100	101	1.0	Pass
		Xylenes	200	176	-12.0	Pass
	13:41	Ethylene	50	46.4	-7.2	Pass
		Propylene	50	49.2	-1.6	Pass
		1-Butene	50	45.1	-9.8	Pass
		1-Pentene	50	47.2	-5.6	Pass
		1-Hexene	50	48.2	-3.6	Pass
		1,3-Butadiene	50	48.8	-2.4	Pass

Instrument Calibration Check						
Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
2/17/2022	8:59	Ethylene	50	47.4	-5.2	Pass
		Propylene	50	51.5	3.0	Pass
		1-Butene	50	45.8	-8.4	Pass
		1-Pentene	50	46.2	-7.6	Pass
		1-Hexene	50	46.5	-7.0	Pass
		1,3-Butadiene	50	48.1	-3.8	Pass
	9:18	Benzene	100	102	2.0	Pass
		Toluene	100	104	4.0	Pass
		Xylenes	200	209	4.5	Pass
	9:22	Benzene	20	20	0.0	Pass
		Toluene	20	20.4	2.0	Pass
		Xylenes	40	41.5	3.8	Pass
	9:32	HCN	25	25.4	1.6	Pass
	8:51	H_2S	100	98	-2.0	Pass
	8:54		20	20.7	3.5	Pass
	9:36	Propane	250	252	0.8	Pass
		Butane	250	229	-8.4	Pass
		Pentane	250	231	-7.6	Pass
		Hexane	250	227	-9.2	Pass
		Heptane	250	237	-5.2	Pass
	16:12	HCN	25	25.7	2.8	Pass
	15:59	H2S	100	99.6	-0.4	Pass
	16:01	Propane	150	151	0.7	Pass
		Butane	150	140	-6.7	Pass
		Pentane	150	148	-1.3	Pass
		Hexane	150	148	-1.3	Pass
		Heptane	150	144	-4.0	Pass
	16:06	Benzene	100	97.6	-2.4	Pass
		Toluene	100	101	1.0	Pass
		Xylenes	200	201	0.5	Pass
	16:15	Ethylene	50	51.3	2.6	Pass
		Propylene	50	54.6	9.2	Pass
		1-Butene	50	48	-4.0	Pass
		1-Pentene	50	50.1	0.2	Pass
		1-Hexene	50	49.1	-1.8	Pass
		1,3-Butadiene	50	49.6	-0.8	Pass

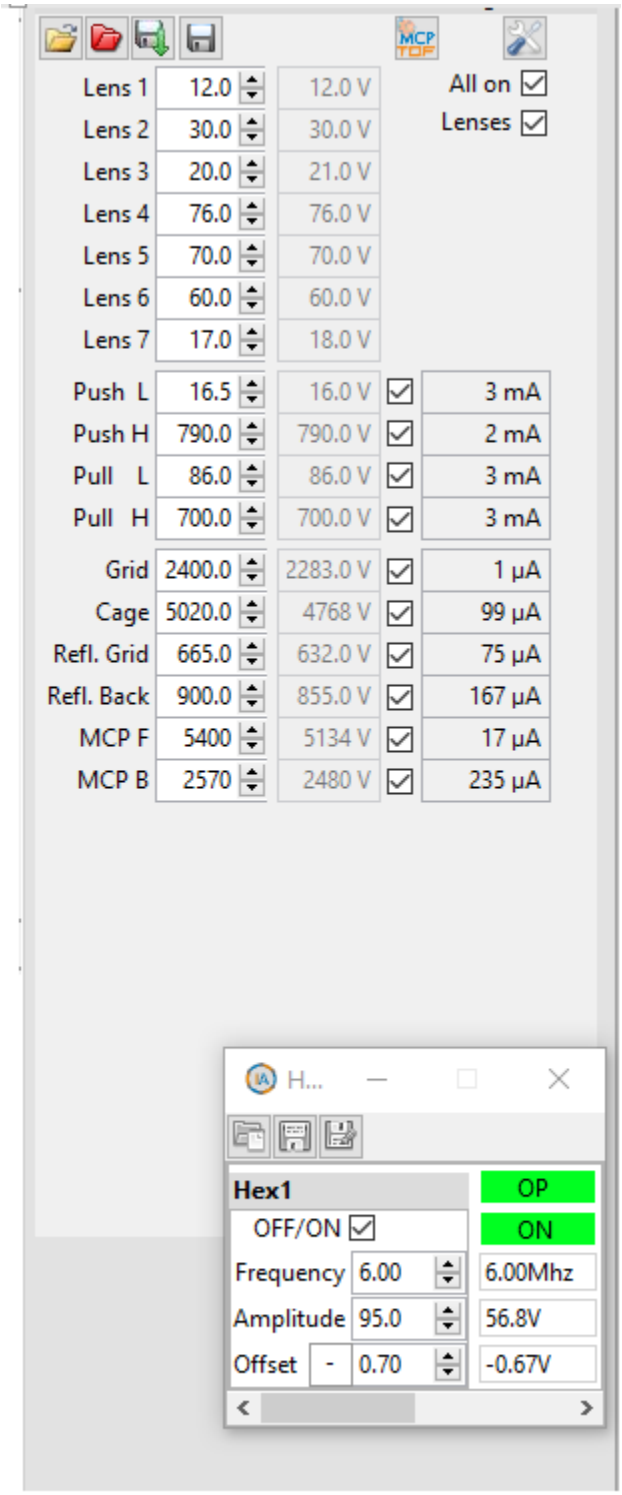
Instrument Calibration Check						
Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
2/18/2022	8:41	Ethylene	50	45.2	-9.6	Pass
		Propylene	50	50.7	1.4	Pass
		1-Butene	50	45.6	-8.8	Pass
		1-Pentene	50	44.5	-11.0	Pass
		1-Hexene	50	45.3	-9.4	Pass
		1,3-Butadiene	50	48.2	-3.6	Pass
	8:45	Benzene	100	103	3.0	Pass
		Toluene	100	106	6.0	Pass
		Xylenes	200	204	2.0	Pass
	8:49	Benzene	20	20.1	0.5	Pass
		Toluene	20	20.3	1.5	Pass
		Xylenes	40	38.7	-3.2	Pass
	8:54	HCN	25	24.6	-1.6	Pass
	9:00	H_2S	100	98.6	-1.4	Pass
	9:05		20	21.7	8.5	Pass
	9:08	Propane	150	148	-1.3	Pass
		Butane	150	139	-7.3	Pass
		Pentane	150	133	-11.3	Pass
		Hexane	150	133	-11.3	Pass
		Heptane	150	139	-7.3	Pass
	15:23	HCN	25	25.8	3.2	Pass
	15:59	H2S	100		-100.0	Fail
	15:29	Propane	150	143	-4.7	Pass
		Butane	150	139	-7.3	Pass
		Pentane	150	142	-5.3	Pass
		Hexane	150	129	-14.0	Pass
		Heptane	150	141	-6.0	Pass
	15:33	Benzene	100	103	3.0	Pass
		Toluene	100	106	6.0	Pass
		Xylenes	200	202	1.0	Pass
	15:39	Ethylene	50	43.4	-13.2	Pass
		Propylene	50	48.7	-2.6	Pass
		1-Butene	50	43	-14.0	Pass
		1-Pentene	50	44.6	-10.8	Pass
		1-Hexene	50	44	-12.0	Pass
		1,3-Butadiene	50	18	-64.0	Fail

Suncor Refining 1st Quarter 2022 Testing Program

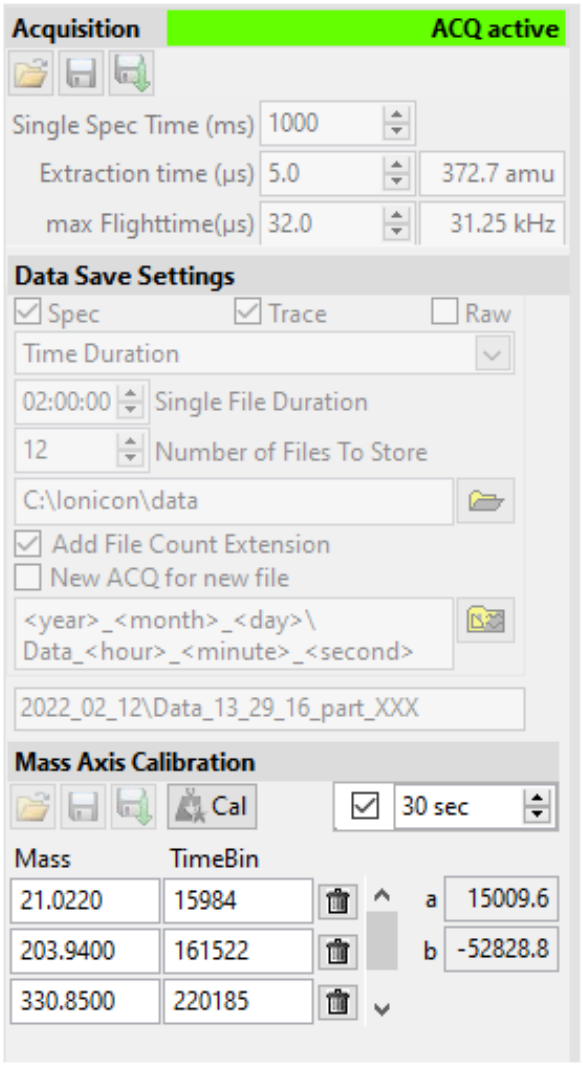
PTR Operational Parameters Screen Shots



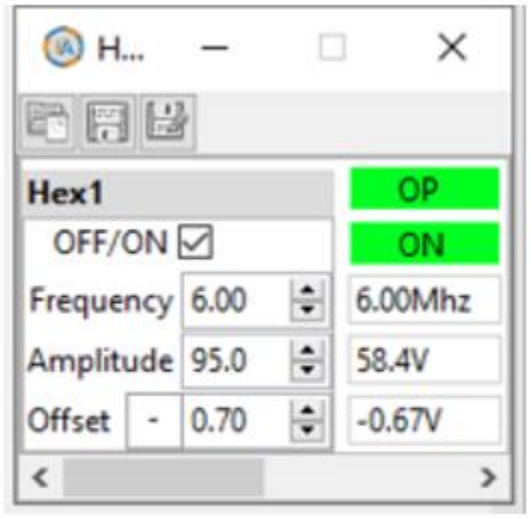
Production Settings



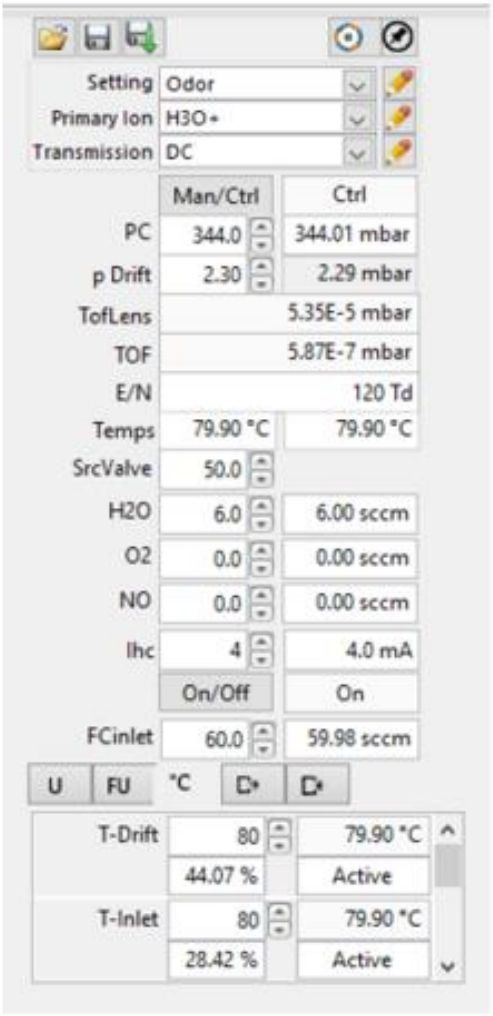
TOF Settings



Acquisition Settings



Hexapole Settings



Inlet Temperature and T-Drift Temperature

APPENDIX E
CALIBRATION GAS CERTIFICATION SHEETS

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
616 Miller Cut Off Road
La Porte, TX 77571
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer: *CRYSTAL LAKE , IL* MONTROSE AIR QUALITY SERVICES
Part Number: X06NI99C15A00A3
Cylinder Number: CC344804
Laboratory: 124 - La Porte Mix - TX
Analysis Date: Jul 30, 2021
Lot Number: 126-402159020-1

Reference Number: 126-402159020-1
Cylinder Volume: 144.3 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 350

Expiration Date: Jul 30, 2024

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
HEXANE	1.000 PPM	0.9950 PPM	+/- 5%
N BUTANE	1.000 PPM	1.002 PPM	+/- 5%
N HEPTANE	1.000 PPM	1.000 PPM	+/- 5%
N PENTANE	1.000 PPM	1.000 PPM	+/- 5%
PROPANE	1.000 PPM	1.009 PPM	+/- 5%
NITROGEN	Balance		

Notes:

PO # PO-011307

Approved for Release

Airgas
an Air Liquide company

Airgas USA, LLC
4646 Linden Rd
Rockford, IL 61109
Airgas.com

CERTIFICATE OF BATCH ANALYSIS

Grade of Product: ZERO

Part Number:	AI Z15A	Reference Number:	152-402047887-1
Cylinder Analyzed:	CC235228	Cylinder Volume:	146.0 CF
Laboratory:	192 - Rockford IL Fill Plant (N513) - IL	Cylinder Pressure:	2000 PSIG
Analysis Date:	Mar 03, 2021	Valve Outlet:	590
Lot Number:	152-402047887-1		

ANALYTICAL RESULTS

Component	Requested Purity	Certified Concentration
AIR		
THC	< 1.0 PPM	0.043 PPM
Percent Oxygen	20-22 %	20.82 %
Moisture	< 3.0 PPM	0.07 PPM

Cylinders in Batch:

CC235228, XC002876B

Impurities verified against analytical standards traceable to NIST by weight and/or analysis.

Signature on file
Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 2
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Part Number:	X02NI99C15A0A19	Reference Number:	SG02-IC000020641-1
Cylinder Number:	CC286616	Cylinder Volume:	143.25 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2000.0 PSIG
Analysis Date:	Jul 08, 2021	Valve Outlet:	350SS
Lot Number:	SG02-IC000020641-1		

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
HYDROGEN CYANIDE	1.000 PPM	1.020 PPM	+/- 5%
NITROGEN	Balance		

Permanent Notes:-NA-

Notes:
Analysis Date: 7/6/2021
Expiration Date: 7/6/2022
Blend +/- 20% Analytical +/- 5%

Approved for Release

Airgas
an Air Liquide company

Airgas USA, LLC
6141 Easton Road
Bldg 1
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer:	MONTROSE ENVIRONMENTAL GROUP		
Part Number:	X02AI99C15AH586	Reference Number:	160-401735121-1
Cylinder Number:	ALM060589	Cylinder Volume:	129.3 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2016 PSIG
Analysis Date:	Feb 19, 2020	Valve Outlet:	590
Lot Number:	160-401735121-1		

Expiration Date: Feb 19, 2023

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
BENZENE	1.000 PPM	1.055 PPM	+/- 5%
AIR	Balance		

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
616 Miller Cut Off Road
La Porte, TX 77571
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer:	MONTROSE AIR QUALITY SERVICES LLC - CRYSTAL LAKE ,		
Part Number:	X07NI99C15A00A9	Reference Number:	126-402159021-1
Cylinder Number:	CC164840	Cylinder Volume:	144.3 CF
Laboratory:	124 - La Porte Mix - TX	Cylinder Pressure:	2015 PSIG
Analysis Date:	Aug 09, 2021	Valve Outlet:	350
Lot Number:	126-402159021-1		

Expiration Date: Aug 09, 2023

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
1 BUTENE	1.000 PPM	0.9918 PPM	+/- 5%
1 HEXENE	1.000 PPM	1.003 PPM	+/- 5%
1 PENTENE	1.000 PPM	1.005 PPM	+/- 5%
1,3 BUTADIENE	1.000 PPM	1.005 PPM	+/- 5%
ETHYLENE	1.000 PPM	1.007 PPM	+/- 5%
PROPYLENE	1.000 PPM	1.006 PPM	+/- 5%
NITROGEN	Balance		

Notes:
MONTROSE AIR QUALITY SERVICES LLC
PO#: PO-011307
NITROGEN BALANCE : 99.99939022%

Approved for Release

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