2024 Q4 MOBILE MONITORING VAN REPORT
COMMERCE CITY NORTH DENVER COMMUNITY AIR MONITORING NETWORK
COMMERCE CITY, COLORADO

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MONTROSE
AIR QUALITY SERVICES

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EXECUTIVE SUMMARY

In response to community feedback Suncor Energy (U.S.A.) Inc. (Suncor) voluntarily developed an air monitoring program to gain insight into air quality for neighborhoods in the vicinity of Suncor's operations in Commerce City, Colorado in 2021. On December 31, 2024, Suncor became required to conduct community monitoring pursuant to CRS § 25-7-146(3)(a). Suncor, however, voluntarily engaged a third-party consultant to perform health risk assessments and publish reports of its monitoring results online. Montrose Environmental Group - Air Quality Services, LLC (Montrose) operates the air monitoring network in the Commerce City and North Denver (CCND) neighborhoods, and health scientists from CTEH, LLC (CTEH®) perform a screening-level human health risk assessment. A screening-level assessment compares exposure concentrations (ECs) to reference levels (RLs) set by state and/or federal guidance that represent exposure levels that protect public health and the environment.

Air monitoring under the program is continuous and near real-time, and uses three separate technical approaches:

(1) Continuous, near real-time air monitoring for the following compounds using sensor technology: carbon monoxide (CO), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), nitrogen dioxide (NO_2), particulate matter ($PM_{2.5}$), total volatile organic compounds (tVOCs), benzene, toluene, ethylbenzene, and xylenes;

(2) Periodic (planned and triggered) air sample collection and laboratory analysis for the presence of 59 VOCs from evacuated canisters (colloquially referred to as "Summa" canisters); and

(3) Periodic real-time air monitoring throughout six neighborhoods using a mobile monitoring van to detect the presence of 65 chemicals that are evaluated as 18 individual chemicals with the remaining 47 chemicals being combined into 12 chemical groups known as isomer groups.

This report details the third approach: the real-time mobile monitoring approach. This report conducts a screening health risk assessment of the detected compounds. The mobile monitoring van contains equipment to measure air concentrations of chemical compounds at ultra-low concentrations. Specifically, the equipment measures sub-parts per billion (ppb) levels at an interval of one reading a second.

To collect this data, the van drove through six CCND residential neighborhoods within a three-mile radius of Suncor operations. For each neighborhood, the route was traversed at approximately 10 miles per hour (mph), and data was collected every one second for each of the 65 chemicals. During the fourth quarter of 2024, the mobile monitoring van collected 56,614 readings and meteorological data for every chemical across the six CCND neighborhoods. A risk assessment was subsequently conducted to determine if the maximum 1-hour average concentrations of individual or cumulative (combined) VOCs could potentially increase the risk of

acute (short-term) adverse health effects. The risk assessment followed federal and state guidelines. The air monitoring data and health risk assessment results for this reporting period indicate the following overall findings:

- All HQs were less than one for all detected chemicals and chemical groups, indicating that the maximum 1-hour rolling average concentration for each chemical was below its respective acute RL in all six neighborhoods
- In this quarter, benzene, hexene group, trimethylbenzene group, hydrogen sulfide, tetrachloroethylene, hydrogen cyanide, xylenes, and toluene were the chemicals or isomer groupings resulting in the highest HQs in each neighborhood, accounting for over 94% of the total calculated HI values. However, all HI values calculated in all six neighborhoods were below one.
- These results indicate that the measured concentrations of chemicals, both individually and cumulative (combined), are not expected to be associated with an increased risk of adverse acute health effects, even for sensitive sub-populations.

1.0 INTRODUCTION

In response to community feedback received by Suncor Energy (U.S.A.) Inc. (Suncor) during community engagement that was conducted in the fall of 2020, Suncor voluntarily developed a continuous, near real-time air monitoring program to gain insight into the air quality for neighborhoods in the vicinity of Suncor's operations in Commerce City, Colorado in 2021. On December 31, 2024, Suncor became required to conduct community monitoring pursuant to CRS § 25-7-146(3)(a). Suncor, however, voluntarily engaged a third-party consultant to perform health risk assessments and publish reports of its air monitoring results online. 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, perform screening-level health risk assessments, and publish reports on the air monitoring results online.

Air monitoring was accomplished through three separate technical approaches:

(1) Continuous, near real-time air monitoring for the following compounds using sensor technology: carbon monoxide (CO), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), nitrogen dioxide (NO_2), particulate matter ($PM_{2.5}$), total volatile organic compounds (tVOCs), benzene, toluene, ethylbenzene, and xylenes;

(2) Periodic (planned and triggered) air sample collection and laboratory analysis for the presence of 59 VOCs from Summa canisters; and

(3) Periodic real-time air monitoring throughout six neighborhoods using a mobile monitoring van to detect the presence of 65 chemicals that are evaluated as 18 individual chemicals with the remaining 47 chemicals being combined into 12 chemical groups known as isomer groups.

This report details the third approach: the real-time mobile monitoring approach. Air monitoring, sampling, and analysis from the first two approaches 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, which is outfitted with equipment necessary to identify and quantify individual chemical compounds present in ambient air to sub-part per billion (ppb) concentrations. Specifically, 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 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. Specifically, an Ionicon Model 4000 PTR-TOF-MS was used for the November 18-21, 2024 testing.

During the mobile monitoring program, the van's instrumentation measured the 18 chemicals and 12 chemical groups, that cover the 65 chemicals listed in Table 1. The groupings consist of compounds with the same chemical composition but different chemical structure (called isomers). Table 1 and Appendix A provide more detail on the usefulness of isomer grouping. Grouped compounds are assessed together as a single chemical group rather than as an individual chemical. Compounds selected for analysis are typical chemicals monitored in urban and industrial areas that are within the analytical capabilities of the mobile monitoring van.

The details of the monitored neighborhoods are listed in Table 2 and are shown in Figure 1.

TABLE 1 MOBILE MONITORING VAN PROGRAM 30 INDIVIDUAL CHEMICALS AND CHEMICAL GROUPS MONITORED[1]

Individual Chemicals

1,3-Butadiene	Dodecanes	Methanol	Tetrachloroethylene
Acetylene	Ethylene	Methylcyclohexane	Toluene
Benzene	Hydrogen Cyanide	Nonanes	Undecanes
Carbon disulfide	Hydrogen Sulfide	Propylene	
Decanes	Isoprene	Styrene	

Grouped Chemicals

Group Name	Specific Isomers	Group Name	Specific Isomers
Butenes	1-Butene	***Xylenes***	Ethyl Benzene
	cis-2-Butene		o-Xylene
	trans-2-Butene		m-Xylene
			p-Xylene
Butanes	iso-Butane		
	n-Butane	***Dimethylcyclohexanes***	Ethylcyclohexane
			cis-1,3-Dimethylcyclohexane
Cyclopentanes	Cyclopentane		trans-1,2-Dimethylcyclohexane
	1-Pentene		
	2-Methyl-2-butene		trans-1,3-Dimethylcyclohexane
	cis-2-Pentene		
	trans-2-Pentene	***Octanes***	n-Octane
			2-Methylheptane
Pentanes	iso-Pentane		3-Methylheptane
	n-Pentane		2,2,4-Trimethylpentane
	neo-Pentane		2,3,4-Trimethylpentane
Hexenes	1-Hexene	***Trimethylbenzenes***	Cumene
	Cyclohexane		1,2,4-Trimethylbenzene
	Methylcyclopentane		o-Ethyltoluene
			m-Ethyltoluene
Hexanes	n-Hexane		p-Ethyltoluene
	2-Methylpentane		n-Propylbenzene
	3-Methylpentane		1,3,5-Trimethylbenzene
	2,2-Dimethylbutane		
	2,3-Dimethylbutane	***Diethylbenzenes***	o-Diethylbenzene
			m-Diethylbenzene
Heptanes	n-Heptane		p-Diethylbenzene
	2-Methylhexane		All other $C_{10}H_{14}$ Isomers
	3-Methylhexane		
	2,3-Dimethylpentane		
	2,4-Dimethylpentane		

[1] See Appendix A for isomer analysis details.

TABLE 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	11/19/2024	12:46	14:58	7,905	4,378
Dupont	1.4	11/19/2024	09:34	12:09	9,349	5,822
Elyria-Swansea	1.2	11/21/2024	09:43	12:14	9,002	5,475
Globeville	0.44	11/20/2024	12:43	15:14	9,005	5,478
Pioneer Park	1.7	11/18/2024	11:10	14:10	10,767	7,240
Western Hills	1.6	11/20/2024	09:27	12:23	10,586	7,059

*Data completeness threshold set at 98%.

2.2 Mobile Monitoring Van Air Sampling Methods

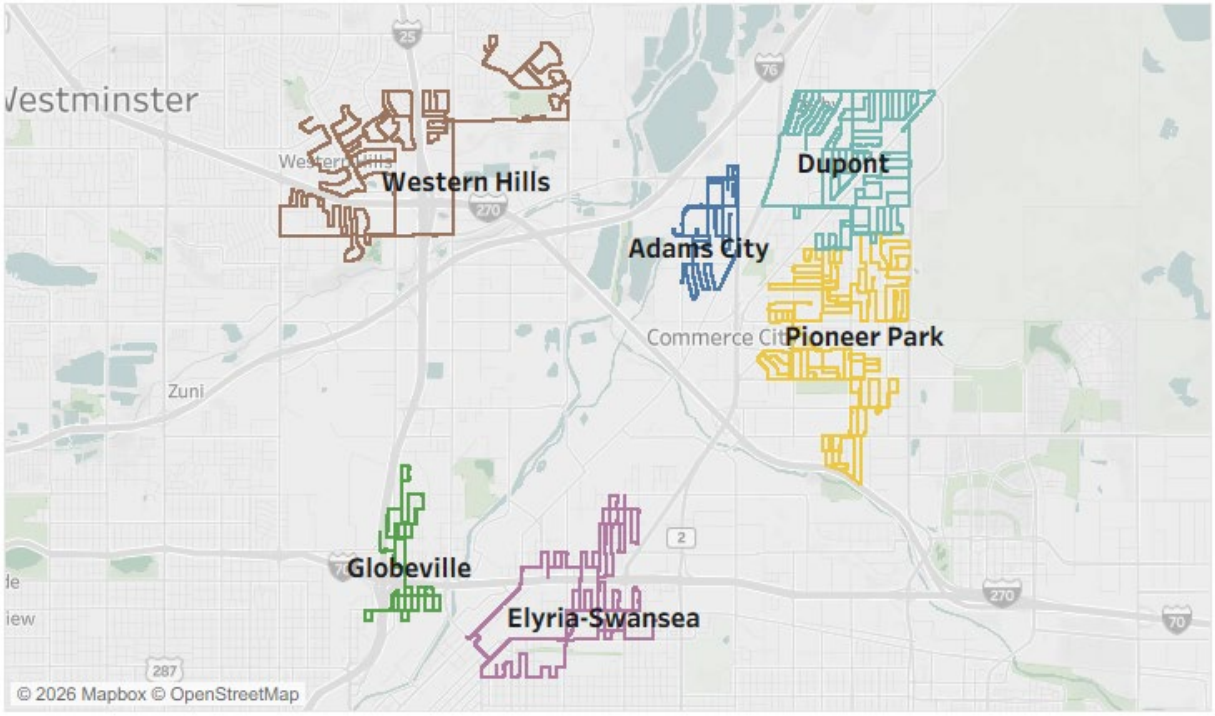
The mobile van is equipped with a Proton-Transfer-Reaction Time-of-Flight Mass Spectrometry (PTR-TOF-MS) to measure VOCs in the air. To ensure the accuracy of the PTR-TOF-MS system, calibration was performed, and the instrument was zeroed each day prior to the collection of any ambient air data. The instrument was calibrated using United States Environmental Protection Agency (USEPA) protocol-certified calibration gases. Not all chemicals listed in Table 1 are available as certified calibration gases. For chemicals with commercially available standards, the multi-chemical cylinder standards were used to perform a multiple-point calibration. For the chemicals without commercially available standards, 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). Next, zero-count measurements were obtained to ensure proper baseline measurements and were incorporated into the calculation of each chemical‘s concentration.

To ensure accuracy was maintained through the sampling process, zero-count measurements were performed through the entire sampling system using ultra-high purity air, and post-testing calibration checks were performed on the instrument to ensure there was no significant drift during the course of the sampling event. Instrument drift can cause an increase or decrease in the measured chemical concentrations, which can lead to either positive or negative biasing of the results.

The mobile monitoring van collected continuous measurements throughout each neighborhood following the routes shown in Figure 1. The ambient air measurements were collected at a height of 15 feet above ground, 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. For specific PTR-TOF-MS instrument operation conditions, see Appendix D attached.

FIGURE 1 MOBILE MONITORING VAN PROGRAM ROUTE TROUGH SIX NEIGHBORHOOD AREAS



2.3 Reference Level Selection for Health Screening Risk Assessment

To perform a risk-based assessment, exposure concentrations must be compared to reference levels (RLs). Reference levels are established by state and federal agencies following extensive review and assume that, if the exposure levels fall below the RL, then no acute or chronic adverse effect is expected in human health and/or the environment, even for sensitive populations.

The RLs used in this report are from the Colorado Department of Public Health and Environment's (CDPHE) Fall 2019 Health Guideline Values.[2] The CDPHE's Fall 2019 Health Guideline Values adopted levels from other state and federal programs including:

- Agency for Toxic Substances and Disease Registry (ATSDR) acute minimum risk levels (MRL);

[2] Colorado Department of Public Health and Environment, Oil and Gas Health Information Response Program, Toxicology and Risk Assessment Section, "Updated acute and chronic health guidance values for use in preliminary risk assessment" (September 20, 2019).

- California EPA Office of Environmental Health Hazard Assessment (OEHHA) Acute Reference Exposure Levels (REL); and

- Texas Commission on Environmental Quality (TCEQ) Air Monitoring Comparison Values (AMCVs).

CDPHE also derives some of its own Health Guideline Values.[3] If the chemical was not listed by CDPHE, CTEH® followed a federal- and state-recommended hierarchy for selection of RLs (Appendix C).

By definition, the RLs used in this report are values that "*are set below levels that, based on current information, might cause adverse health effects in the people most sensitive*."[4] 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. Therefore, these values are intended to represent the level at which there is no potential increased risk of adverse health effects being observed in a population, accounting for susceptible individuals. As such, if exposure is found to be above the RLs during the screening-level risk assessment, additional steps, including a more nuanced exposure characterization, are required before determining if the population will experience changes in risk of adverse health effects.

In addition to RLs, the USEPA also has established values for use in emergency situations, termed Acute Exposure Guideline Levels (AEGLs) that are also presented as another point of comparison. 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. However, a concentration above an AEGL-1 value does not necessarily mean that health effects will 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].*"[5] 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.

2.4 Screening Health Risk Assessment Methods

To determine whether exposure to the detected concentrations of individual or cumulative (combined) chemicals in the air could potentially alter the risk of acute (short-term) health effects, CTEH® conducted a screening-level public health risk assessment, consistent with federal and

[3] Colorado Department of Public Health and Environment, Oil and Gas Health Information Response Program, Toxicology and Risk Assessment Section, "Updated acute and chronic health guidance values for use in preliminary risk assessment" (September 20, 2019).
[4] https://www.atsdr.cdc.gov/minimal-risk-levels/php/about/index.html
[5] https://www.epa.gov/aegl/about-acute-exposure-guideline-levels-aegls

state risk assessment guidelines. A tiered approach to this 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 the use of exposure assumptions that are health-conservative.

During this process, data reflecting the maximum exposure potential are assumed during risk calculations. If this screening-level risk assessment indicates that the estimated community exposure is above the RL, this does not indicate that adverse health effects are occurring or will occur, but rather a more detailed exposure characterization is required to determine whether the exposure is higher than the RL.

For this assessment, CTEH® performed a screening-level risk assessment that used the maximum 1-hour rolling average as the exposure concentration (EC) and the RLs provided by the CDPHE or other state/federal agencies to generate a hazard quotient (HQ). The HQ is a measure of risk that is calculated by dividing the EC by the corresponding RL for each compound individually (Eq. 1). In this assessment, HQs were generated for the individual chemicals (18 total) and chemical groups (12 total; Table 2) with the lowest available risk level. Where the EC was determined to be below the detection limit, one half of the method detection limit was assigned.

Eq. 1 – Hazard Quotient (HQ) Equation

$$Hazard\ Quotient\ (HQ) = \frac{Exposure\ Concentration\ (EC)}{Reference\ Level\ (RL)}$$

The assumptions used in this assessment were chosen to be protective of human health. The first assumption was the grouping of chemicals into isomer groups. 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 health-protective determination of concentration during this mapping program, each isomer's concentration is reported by summing all the concentrations of the isomers with the same molecular weight within the isomer group. Because of this, the screening-level risk assessment was undertaken for the individual chemicals and for the chemical groups (Table 2). One of the individual chemicals (propylene) did not have health-based RLs, resulting in its exclusion from the assessment, but its concentrations were reported. Thus, the screening-level risk assessment includes acute risks from exposure to 17 (out of the 18) chemicals and to 12 chemical groups, for a total of 29. In addition, the assessment includes acute risks from exposure to all the 29 measured compounds at once (cumulative).

The next assumption was to set the EC to the maximum 1-hour rolling average concentrations of each chemical in each of the six CCND neighborhoods. These were calculated by averaging a 1-hour time window of the 1-second air concentrations, and the time window moved (rolled) one second forward in time to calculate the next average. The window required 98% of 1-second readings (or 3,528 1-second concentrations) to calculate the average. If the window was below

98%, it continued moving forward one second at a time until the 1-hour window contained 98% of 1-second readings. 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 rolling average concentration continuously for an hour up to multiple days (an acute exposure). Averaging the 1-second concentrations to 1-hour reduces the variability in the data that is due to both measurement accuracy and potential transient sources which the monitoring van may encounter and sample, such as emissions from an idle truck (see notes in Appendix D). Averaging the concentrations provides an estimate that is closer to the real-world ambient air concentrations that the majority of individuals may be breathing in the CCND area. Across all neighborhoods, 35,452 1-hour rolling averages of air concentrations for each chemical and chemical group were calculated to derive the estimated ECs (Table 2). The range between the average and maximum 1-hour rolling averages provides a robust estimate of plausible outdoor ambient air concentrations in the monitored neighborhood while the mobile monitoring van was present (Figures 2-7).

The last assumption was to use the RLs in the HQ calculation that are based on exposures that occur for an hour up to 14 days (i.e., acute exposure). The AEGL-1 values, or the guidance values used in emergency situations that assume a single hour of exposure, are higher than the RL counterparts used in this analysis. Overall, this set of assumptions uses a higher-than-likely exposure concentration and a lower threshold level of concern for health effects, making this more health-protective than other approaches.

To determine the impact of cumulative chemical exposure, a Hazard Index (HI) was generated. This is a process by which HQs are summed across chemicals (Eq. 2). This is a health-protective 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. In this assessment, HIs were calculated by summing HQs across all individual chemicals and chemical groups in Table 2.

Eq. 2 – Hazard Quotient (HI) Equation

$$Hazard\ Index\ (HI) = \sum_{i} HQ_i$$

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[6]. As such, an exceedance of an acceptable risk level does not indicate that adverse health effects are likely but rather that "*[h]ealth assessors may want to look more closely at a site where they find exposures higher than the MRLs*"[7]. In other words, an HQ or HI greater than one suggests a need to refine the risk assessment process with more realistic details of potential exposure to determine if risk exists.

[6] USEPA. 2004. Air Toxics Risk Assessment Reference Library. Volume 1. U.S. Environmental Protection Agency Office of Air Quality Planning and Standards Research Triangle Park, NC. EPA-453-K-04-001A
[7] https://www.atsdr.cdc.gov/minimal-risk-levels/about/index.html

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. Over four days, six neighborhoods were monitored for 65 chemicals total (that are evaluated as 18 individual chemicals with the remaining 47 chemicals being combined into 12 chemical groups known as isomer groups), resulting in more than 56,614 total 1-second air measurements for each chemical. Individual neighborhood results are detailed in Figures 2-7. Each figure shows a map of the monitoring route within each neighborhood, the chemicals that resulted in the five highest calculated acute HQs, and the chemical concentration trends over time. The trend graphs show all the 1-second readings (orange) and calculated 1-hour rolling averages (green) of the ambient air concentrations. Each green 1-hour average concentration reflects the average of 1-second measurements collected over the previous hour. Thus, 1-hour rolling average concentrations are shown on the graphs after one hour of data collection (Figures 2-7).

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 nearest to the neighborhood being monitored as the fixed meteorological station is more reliable than the station on the mobile monitoring van when the van 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 indicates that exposures are likely to be without any acute adverse health effects, even for sensitive sub-populations.

Figures 2 through 7 show concentrations of chemicals over the sampling time and summaries of results for compounds (or groups) resulting in the five highest HQs by neighborhood. The estimated HI shown in Figures 2 through 7 were calculated by summing the HQs of all detected chemicals measured in a given neighborhood. If any measured chemical resulted in a HQ greater than one, then a separate figure would be shown for that chemical alone. Complete results for HQs for all chemicals measured in each neighborhood are available in Appendix C.

In conclusion, the air concentrations collected during this study phase did not indicate a potential for acute adverse health effects, both individually and combined.

- All HQs were less than one for all detected chemicals and chemical groups, indicating that the maximum 1-hour rolling average concentration for each chemical was below its respective acute RL in all six neighborhoods (Figures 2-7).

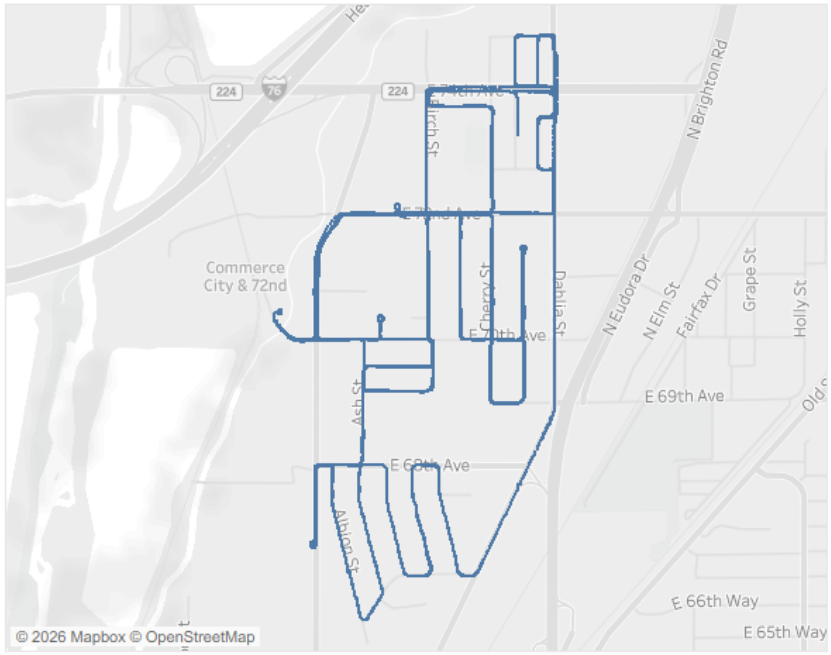
- In this quarter, benzene, hexene group, trimethylbenzene group, hydrogen sulfide, tetrachloroethylene, hydrogen cyanide, xylenes, and toluene were the chemicals or isomer groupings resulting in the highest HQs in each neighborhood, accounting

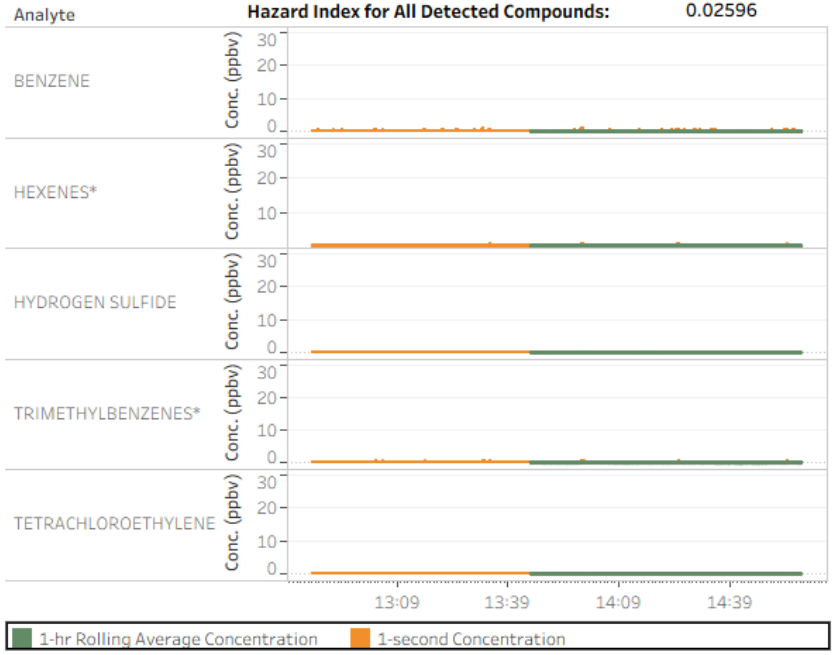
for over 94% of the total calculated HI values. However, all HI values calculated in all six neighborhoods were below one (Figures 2-7).

- These results indicate that the measured concentrations of chemicals, both individually and cumulative (combined), are not expected to be associated with an increased risk of adverse acute health effects, even for sensitive sub-populations.

FIGURE 2 ADAMS CITY NEIGHBORHOOD: November 19, 2024

Analyte	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 (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	0.94	4,378	0.18	0.18	52,000	9	0.02038
HEXENES*	1.27	4,378	0.59	0.59	NR	500	0.00118
HYDROGEN SULFIDE	0.15	4,378	0.07	0.07	510	70	0.00104
TRIMETHYLBENZENES*	0.63	4,378	0.15	0.16	NR	250	0.00063
TETRACHLOROETHYLENE	0.07	4,378	0.00	0.00	35,000	6	0.00061

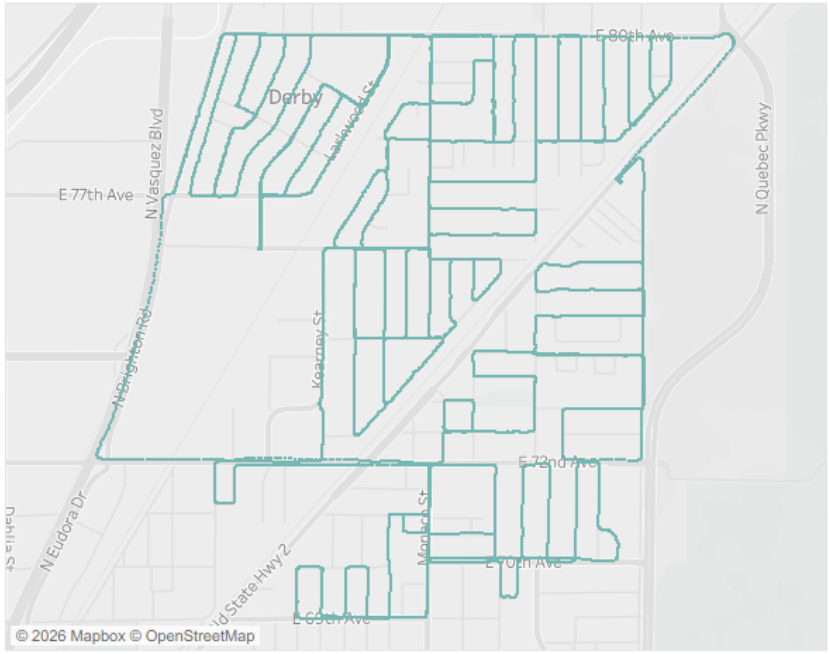


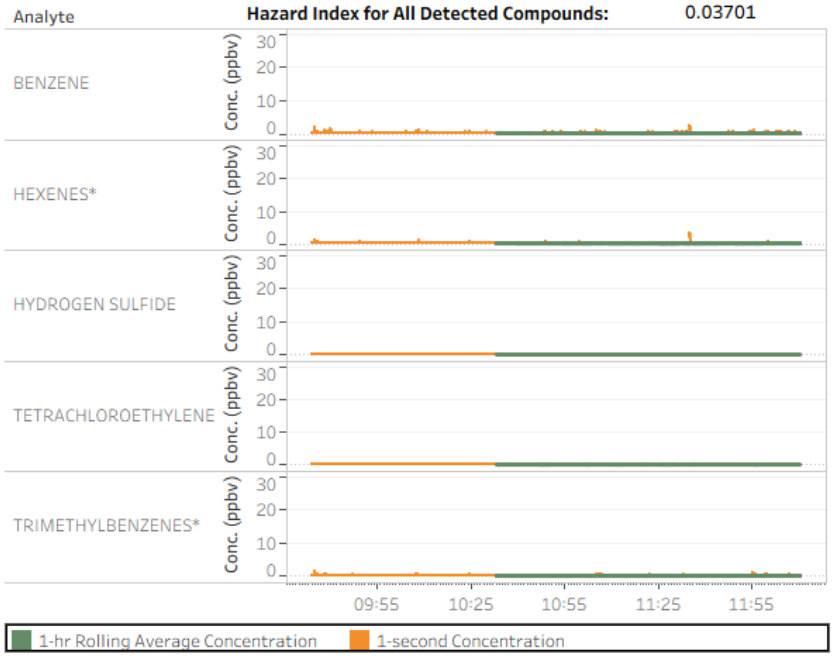


*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

FIGURE 3 DUPONT NEIGHBORHOOD: November 19, 2024

Analyte	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 (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	2.35	5,822	0.25	0.28	52,000	9	0.03139
HEXENES*	3.57	5,822	0.58	0.60	NR	500	0.00120
HYDROGEN SULFIDE	0.14	5,822	0.07	0.07	510	70	0.00104
TETRACHLOROETHYLENE	0.07	5,822	0.00	0.00	35,000	6	0.00078
TRIMETHYLBENZENES*	1.26	5,822	0.14	0.16	NR	250	0.00063

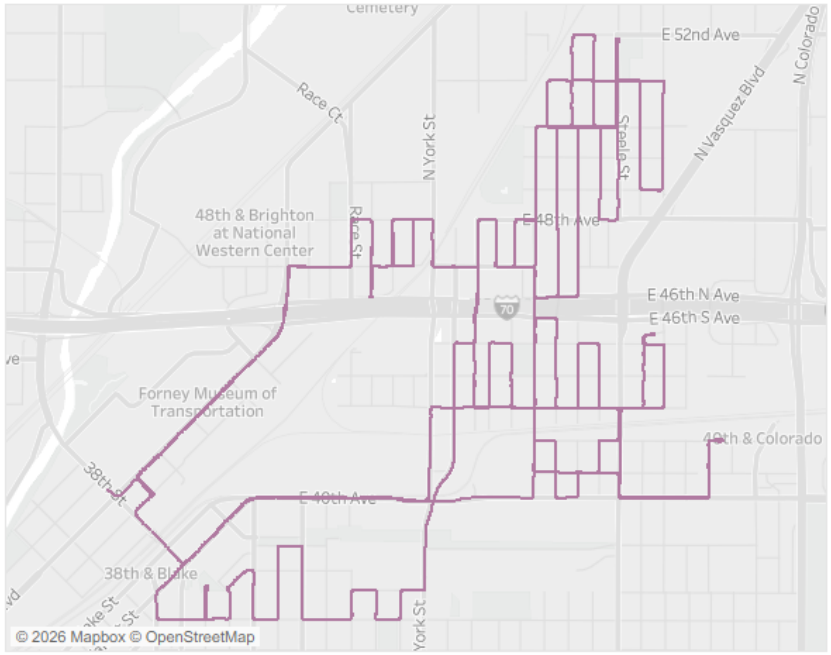


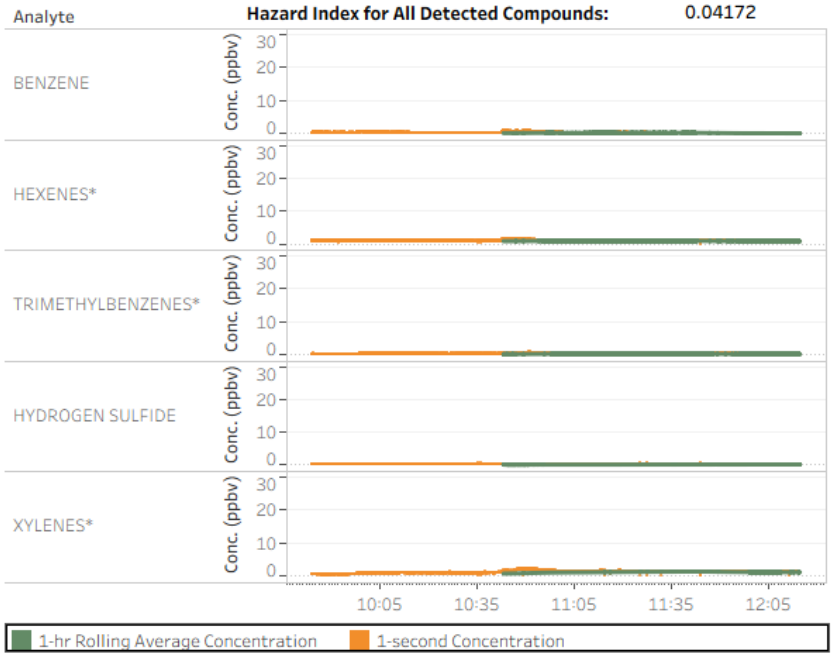


*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

FIGURE 4 ELYRIA-SWANSEA NEIGHBORHOOD: November 21, 2024

Analyte	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 (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	0.91	5,475	0.24	0.30	52,000	9	0.03293
HEXENES*	1.49	5,475	0.90	0.95	NR	500	0.00190
TRIMETHYLBENZENES*	0.87	5,475	0.39	0.42	NR	250	0.00167
HYDROGEN SULFIDE	0.41	5,475	0.09	0.10	510	70	0.00149
XYLENES*	2.41	5,475	1.29	1.48	130,000	2,000	0.00074

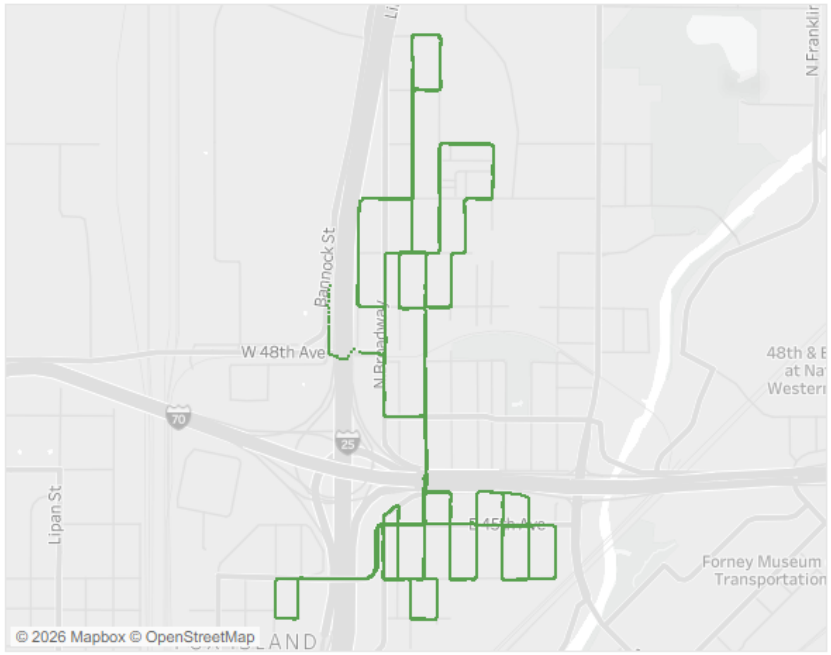


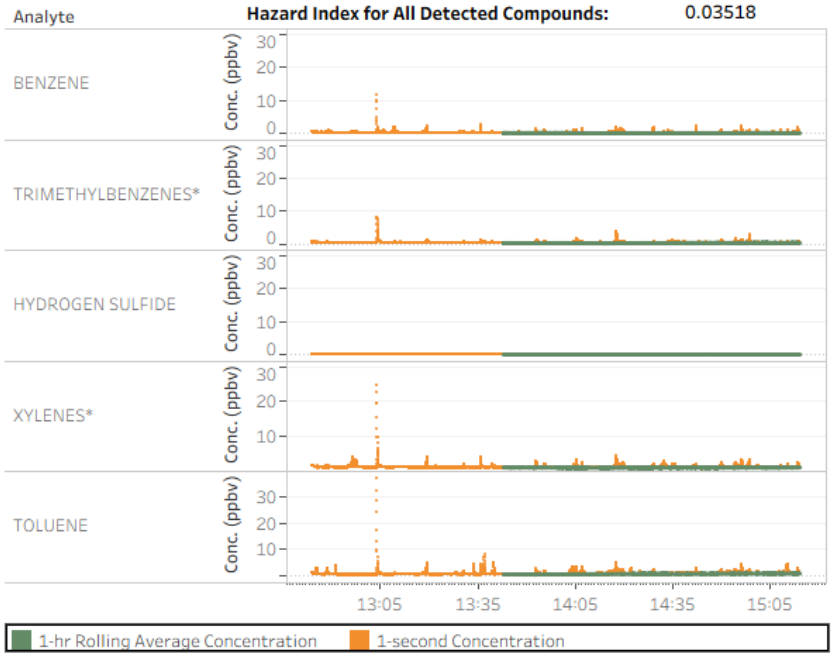


*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

FIGURE 5 GLOBEVILLE NEIGHBORHOOD: November 20, 2024

Analyte	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 (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	11.58	5,478	0.23	0.27	52,000	9	0.02948
TRIMETHYLBENZENES*	8.03	5,478	0.26	0.31	NR	250	0.00124
HYDROGEN SULFIDE	0.27	5,478	0.07	0.07	510	70	0.00105
XYLENES*	24.54	5,478	1.13	1.18	130,000	2,000	0.00059
TOLUENE	36.85	5,478	0.92	1.11	67,000	2,000	0.00055

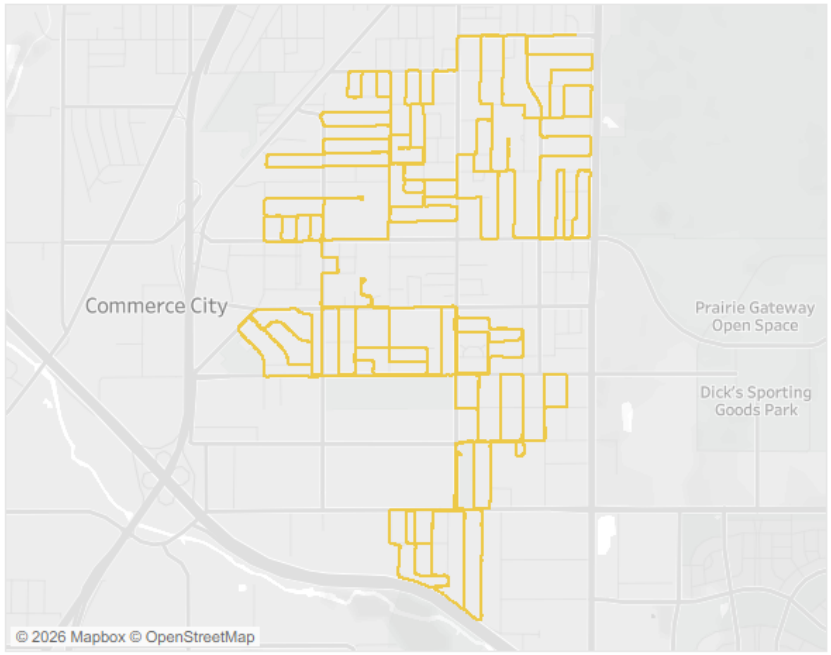


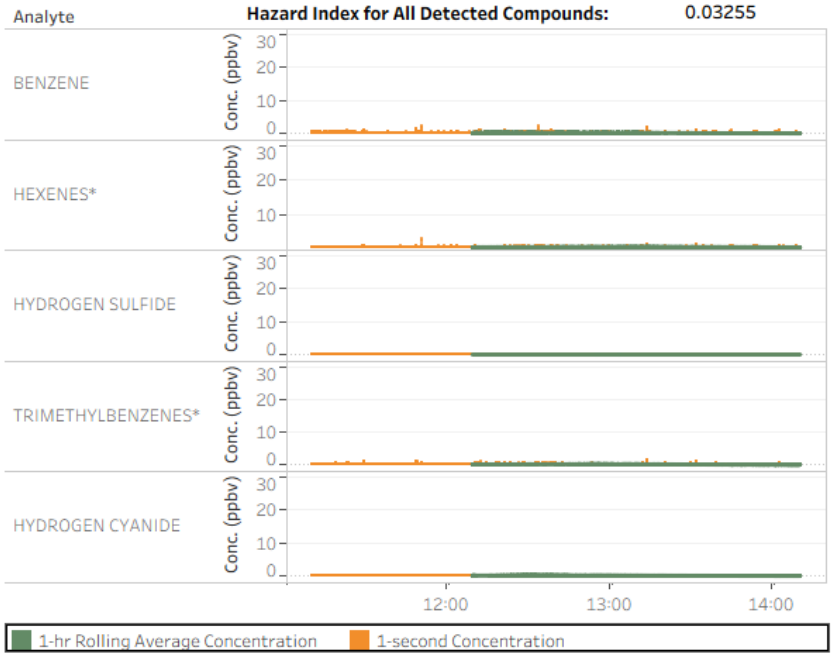


*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

FIGURE 6 PIONEER PARK NEIGHBORHOOD: November 18, 2024

Analyte	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 (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	2.34	7,240	0.18	0.23	52,000	9	0.02574
HEXENES*	3.04	7,240	0.84	0.86	NR	500	0.00172
HYDROGEN SULFIDE	0.22	7,240	0.07	0.07	510	70	0.00104
TRIMETHYLBENZENES*	1.34	7,240	0.19	0.23	NR	250	0.00093
HYDROGEN CYANIDE	0.38	7,240	0.20	0.24	2,000	308	0.00076

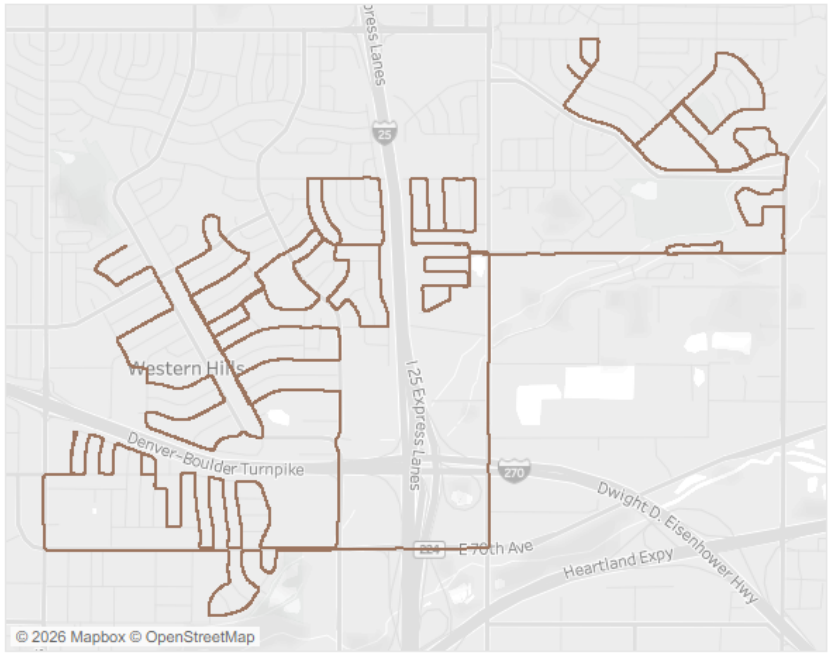


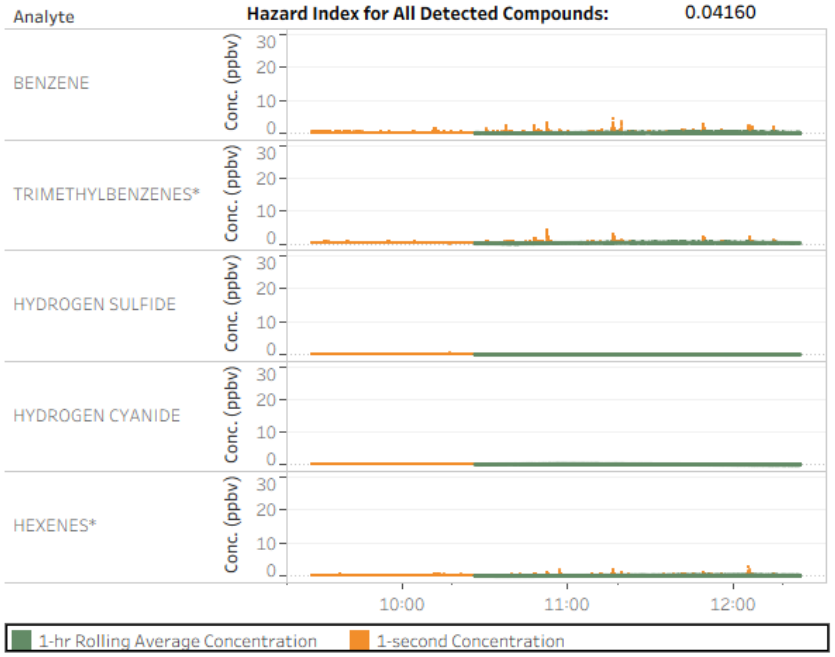


*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

FIGURE 7 WESTERN HILLS NEIGHBORHOOD: November 20, 2024

Analyte	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 (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	4.61	7,059	0.27	0.33	52,000	9	0.03615
TRIMETHYLBENZENES*	4.10	7,059	0.27	0.34	NR	250	0.00136
HYDROGEN SULFIDE	0.41	7,059	0.07	0.07	510	70	0.00106
HYDROGEN CYANIDE	0.30	7,059	0.16	0.18	2,000	308	0.00059
HEXENES*	2.83	7,059	0.23	0.26	NR	500	0.00051





*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. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

3.3 Strengths and Limitations

Scientific uncertainty is inherent in each step of the risk assessment process because all risk assessments incorporate a variety of assumptions and professional judgments[8,9]. Therefore, the acute health hazard estimates presented in this assessment are conditional estimates given a considerable number of assumptions about exposure and toxicity.

This screening-level inhalation risk assessment relied on a combination of health-protective exposure scenarios and input values (i.e., high-end exposures and health-protective selection of acute reference levels intended to reflect up to 14 days of exposure). Because of these assumptions, the estimates of acute hazards are likely to be over-estimates of actual risk. However, 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. It can be used to inform on air quality in the CCND and guide decision-making.

4.0 PROGRAM CHANGES

No program changes.

Respectfully Submitted:

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

[8] USEPA.1989. Risk Assessment Guidance for Superfund, Vol. I: Human Health Evaluation Manual (Part A). EPA/540/1-89/002, Interim Final, Office of Emergency and Remedial Response, Washington DC
[9] USEPA. 2004. Air Toxics Risk Assessment Reference Library. Volume 1. U.S. Environmental Protection Agency Office of Air Quality Planning and Standards Research Triangle Park, NC. EPA-453-K-04-001A

APPENDIX A ISOMER CHEMICAL SAMPLING DETAILS

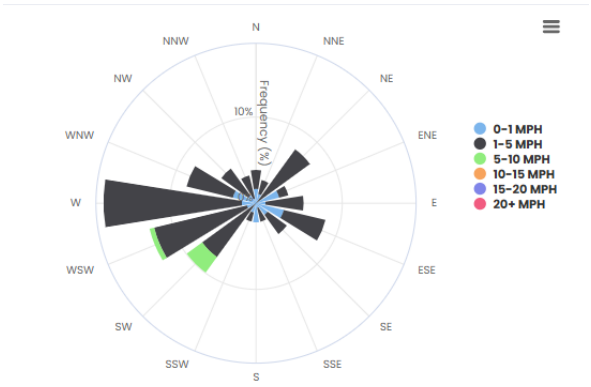
In a real-time PTR-TOF analysis, it is not possible to speciate isomers, or chemical compounds that have the same molecular weight. For example, n-hexane, 2-methyl pentane and 2,2-dimethyl butane all have a molecular mass of 86.178 g/mol. In order to provide the most conservative determination of concentration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

Group Name	Specific Isomers
Butenes	1-Butene
	cis-2-Butene
	trans-2-Butene
Butanes	iso-Butane
	n-Butane
Cyclopentanes	Cyclopentane
	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

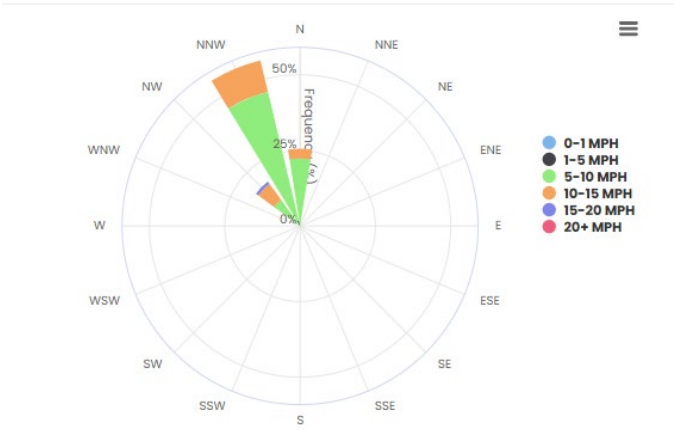
Group Name	Specific Isomers
Xylenes	Ethyl Benzene
	o-Xylene
	m-Xylene
	p-Xylene
Dimethylcyclohexanes	Ethylcyclohexane
	cis-1,3-Dimethylcyclohexane
	trans-1,2-Dimethylcyclohexane
	trans-1,3-Dimethylcyclohexane
Octanes	n-Octane
	2-Methylheptane
	3-Methylheptane
	2,2,4-Trimethylpentane
	2,3,4-Trimethylpentane
Trimethylbenzenes	Cumene
	1,2,4-Trimethylbenzene
	o-Ethyltoluene
	m-Ethyltoluene
	p-Ethyltoluene
	n-Propylbenzene
	1,3,5-Trimethylbenzene
Diethylbenzenes	o-Diethylbenzene
	m-Diethylbenzene
	p-Diethylbenzene
	All other $C_{10}H_{14}$ Isomers

APPENDIX B DAILY WIND ROSES

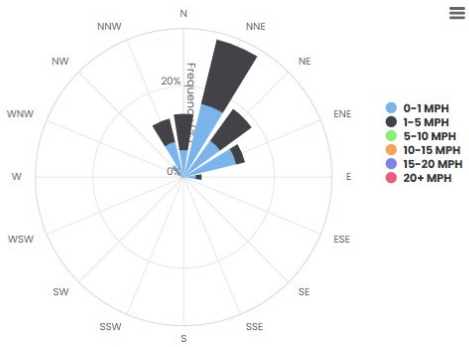
Wind Rose | Pioneer Park (CM7) 11:10am – 2:10pm, November 18, 2024



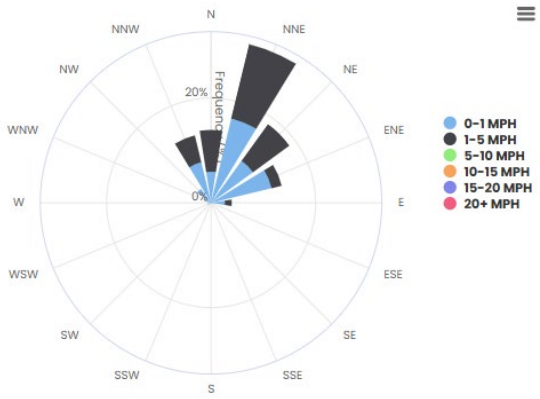
Wind Rose | Dupont (CM3) 9:34am – 12:09pm, November 19, 2024



Wind Rose | Elyria-Swansea (CM9) 9:34am – 12:14pm, November 21, 2024

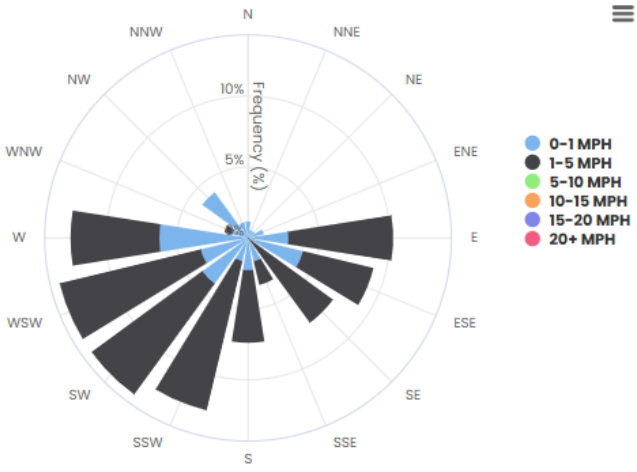


Wind Rose | Globeville (CM9) 12:34pm – 3:14pm, November 21, 2024



Wind Rose | Adams City (CM4) 12:46pm – 2:58pm, November 19, 2024

Wind Rose | Western Hills (CM4) 9:27am – 12:23pm, November 20, 2024



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

Mobile Laboratory Sampling Data Summary and Risk Assessment | 2024 Q4

Adams City Neighborhood | November 19, 2024

Analyte	Cas No	Method Detection Limit (ppbv)	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	0.029	7,905	0.52	4,378	0.02	0.02	670,000	298	OEHHA Acute REL	0.00006
ACETYLENE	74-86-2	0.112	7,905	1.15	4,378	0.15	0.15	NR	25,000	TCEQ Short-Term AMCV	0.00001
BENZENE	71-43-2	0.05	7,905	0.94	4,378	0.18	0.18	52,000	9	ATSDR Acute MRL	0.02038
BUTANES*	75-28-5	0.421	7,905	39.88	4,378	2.68	2.75	NR	33000	TCEQ Short-Term AMCV	0.00008
BUTENES*	590-18-1	0.405	7,905	3.73	4,378	1.63	1.66	NR	15000	TCEQ Short-Term AMCV	0.00011
CARBON DISULFIDE	75-15-0	0.033	7,905	0.20	4,378	0.02	0.02	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANES*	287-92-3	0.107	7,905	7.56	4,378	1.71	1.74	NR	5,900	TCEQ Short-Term AMCV	0.00029
DECANES	124-18-5	0.023	7,905	0.22	4,378	0.05	0.05	NR	1,000	TCEQ Short-Term AMCV	0.00005
DIETHYLBENZENES*	141-93-5	0.026	7,905	0.13	4,378	0.03	0.03	NR	450	TCEQ Short-Term AMCV	0.00007
DIMETHYLCYCLOHEXANES*	638-04-0	0.036	7,905	0.06	4,378	0.02	0.02	NR	4,000	CDPHE	0.00000
DODECANES	112-40-3	0.001	7,905	0.10	4,378	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	0.164	7,905	55.66	4,378	5.69	5.88	NR	500,000	TCEQ Short-Term AMCV	0.00001
HEPTANES*	142-82-5	0.052	7,905	0.12	4,378	0.06	0.06	NR	8,300	TCEQ Short-Term AMCV	0.00001
HEXANES*	110-54-3	0.07	7,905	0.24	4,378	0.07	0.07	NR	5,400	TCEQ Short-Term AMCV	0.00001
HEXENES*	592-41-6	0.056	7,905	1.27	4,378	0.59	0.59	NR	500	TCEQ Short-Term AMCV	0.00118
HYDROGEN CYANIDE	74-90-8	0.06	7,905	0.29	4,378	0.17	0.18	2,000	308	OEHHA Acute REL	0.00059
HYDROGEN SULFIDE	7783-06-4	0.146	7,905	0.15	4,378	0.07	0.07	510	70	ATSDR Acute MRL	0.00104
ISOPRENE	78-79-5	0.08	7,905	0.10	4,378	0.04	0.04	NR	1,400	TCEQ Short-Term AMCV	0.00003
METHANOL	67-56-1	0.208	7,905	19.63	4,378	5.05	5.13	530,000	21,366	OEHHA Acute REL	0.00024
METHYLCYCLOHEXANE	108-87-2	0.053	7,905	0.11	4,378	0.06	0.07	NR	4,000	TCEQ Short-Term AMCV	0.00002
NONANES	111-84-2	0.019	7,905	0.18	4,378	0.03	0.03	NR	3,000	TCEQ Short-Term AMCV	0.00001
OCTANES*	111-65-9	0.025	7,905	0.21	4,378	0.12	0.12	NR	4,100	TCEQ Short-Term AMCV	0.00003
PENTANES*	109-66-0	0.046	7,905	5.64	4,378	0.39	0.42	NR	68,000	TCEQ Short-Term AMCV	0.00001
PROPYLENE	115-07-1	0.183	7,905	1.76	4,378	0.39	0.40	NR	NA	NA	
STYRENE	100-42-5	0.07	7,905	0.05	4,378	0.04	0.04	20,000	5,000	ATSDR Acute MRL	0.00001
TETRACHLOROETHYLENE	127-18-4	0.001	7,905	0.07	4,378	0.00	0.00	35,000	6	ATSDR Acute MRL	0.00061
TOLUENE	108-88-3	0.056	7,905	4.70	4,378	0.50	0.52	67,000	2,000	ATSDR Acute MRL	0.00026
TRIMETHYLBENZENES*	622-96-8	0.032	7,905	0.63	4,378	0.15	0.16	50,000	250	TCEQ Short-Term AMCV	0.00063
UNDECANES	1120-21-4	0.018	7,905	0.09	4,378	0.01	0.01	NR	550	TCEQ Short-Term AMCV	0.00002
XYLENES*	1330-20-7	0.068	7,905	1.64	4,378	0.37	0.39	130,000	2,000	ATSDR Acute MRL	0.00019
										Hazard Index	0.02596

The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average.
*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.
CDPHE = Colorado Department of Public Health and Environment; **TCEQ** = Texas Commission on Environmental Quality; **ATSDR** = Agency for Toxic Substances and Disease Registry; **OEHHA** = California Office of Environmental Health Hazard Assessment
MRL = Minimal Risk Level; **REL** = Reference Exposure Level; **AMCV** = Air Monitoring Comparison Values; **AEGL** = Acute Exposure Guideline Levels
ppbv = parts per billion volume
NA = Not Available
NR = According to EPA, AEGL is "Not Recommended due to insufficient data."

Mobile Laboratory Sampling Data Summary and Risk Assessment | 2024 Q4

Dupont Neighborhood | November 19, 2024

Analyte	Cas No	Method Detection Limit (ppbv)	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	0.029	9,349	0.46	5,822	0.02	0.02	670,000	298	OEHHA Acute REL	0.00006
ACETYLENE	74-86-2	0.112	9,349	0.87	5,822	0.09	0.10	NR	25,000	TCEQ Short-Term AMCV	0.00000
BENZENE	71-43-2	0.05	9,349	2.35	5,822	0.25	0.28	52,000	9	ATSDR Acute MRL	0.03139
BUTANES*	75-28-5	0.421	9,349	19.53	5,822	2.59	2.66	NR	33000	TCEQ Short-Term AMCV	0.00008
BUTENES*	590-18-1	0.405	9,349	4.64	5,822	1.61	1.71	NR	15000	TCEQ Short-Term AMCV	0.00011
CARBON DISULFIDE	75-15-0	0.033	9,349	0.20	5,822	0.02	0.02	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANES*	287-92-3	0.107	9,349	8.74	5,822	2.64	2.77	NR	5,900	TCEQ Short-Term AMCV	0.00047
DECANES	124-18-5	0.023	9,349	0.19	5,822	0.05	0.06	NR	1,000	TCEQ Short-Term AMCV	0.00006
DIETHYLBENZENES*	141-93-5	0.026	9,349	0.11	5,822	0.03	0.04	NR	450	TCEQ Short-Term AMCV	0.00009
DIMETHYLCYCLOHEXANES*	638-04-0	0.036	9,349	0.08	5,822	0.02	0.02	NR	4,000	CDPHE	0.00000
DODECANES	112-40-3	0.001	9,349	0.09	5,822	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	0.164	9,349	90.49	5,822	5.18	5.64	NR	500,000	TCEQ Short-Term AMCV	0.00001
HEPTANES*	142-82-5	0.052	9,349	0.06	5,822	0.03	0.03	NR	8,300	TCEQ Short-Term AMCV	0.00000
HEXANES*	110-54-3	0.07	9,349	0.21	5,822	0.04	0.05	NR	5,400	TCEQ Short-Term AMCV	0.00001
HEXENES*	592-41-6	0.056	9,349	3.57	5,822	0.58	0.60	NR	500	TCEQ Short-Term AMCV	0.00120
HYDROGEN CYANIDE	74-90-8	0.06	9,349	0.33	5,822	0.11	0.13	2,000	308	OEHHA Acute REL	0.00041
HYDROGEN SULFIDE	7783-06-4	0.146	9,349	0.14	5,822	0.07	0.07	510	70	ATSDR Acute MRL	0.00104
ISOPRENE	78-79-5	0.08	9,349	0.15	5,822	0.04	0.04	NR	1,400	TCEQ Short-Term AMCV	0.00003
METHANOL	67-56-1	0.208	9,349	290.47	5,822	1.73	3.16	530,000	21,366	OEHHA Acute REL	0.00015
METHYLCYCLOHEXANE	108-87-2	0.053	9,349	0.11	5,822	0.06	0.07	NR	4,000	TCEQ Short-Term AMCV	0.00002
NONANES	111-84-2	0.019	9,349	0.17	5,822	0.03	0.03	NR	3,000	TCEQ Short-Term AMCV	0.00001
OCTANES*	111-65-9	0.025	9,349	0.23	5,822	0.15	0.15	NR	4,100	TCEQ Short-Term AMCV	0.00004
PENTANES*	109-66-0	0.046	9,349	5.30	5,822	0.39	0.43	NR	68,000	TCEQ Short-Term AMCV	0.00001
PROPYLENE	115-07-1	0.183	9,349	7.85	5,822	0.40	0.43	NR	NA	NA	
STYRENE	100-42-5	0.07	9,349	0.10	5,822	0.04	0.04	20,000	5,000	ATSDR Acute MRL	0.00001
TETRACHLOROETHYLENE	127-18-4	0.001	9,349	0.07	5,822	0.00	0.00	35,000	6	ATSDR Acute MRL	0.00078
TOLUENE	108-88-3	0.056	9,349	15.65	5,822	0.43	0.49	67,000	2,000	ATSDR Acute MRL	0.00024
TRIMETHYLBENZENES*	622-96-8	0.032	9,349	1.26	5,822	0.14	0.16	50,000	250	TCEQ Short-Term AMCV	0.00063
UNDECANES	1120-21-4	0.018	9,349	0.06	5,822	0.01	0.01	NR	550	TCEQ Short-Term AMCV	0.00002
XYLENES*	1330-20-7	0.068	9,349	2.98	5,822	0.27	0.29	130,000	2,000	ATSDR Acute MRL	0.00014
										Hazard Index	**0.03701**

The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average.
*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.
CDPHE = Colorado Department of Public Health and Environment; **TCEQ** = Texas Commission on Environmental Quality; **ATSDR** = Agency for Toxic Substances and Disease Registry; **OEHHA** = California Office of Environmental Health Hazard Assessment
MRL = Minimal Risk Level; **REL** = Reference Exposure Level; **AMCV** = Air Monitoring Comparison Values; **AEGL** = Acute Exposure Guideline Levels
ppbv = parts per billion volume
NA = Not Available
NR = According to EPA, AEGL is "Not Recommended due to insufficient data."

Mobile Laboratory Sampling Data Summary and Risk Assessment | 2024 Q4

Elyria-Swansea Neighborhood | November 21, 2024

Analyte	Cas No	Method Detection Limit (ppbv)	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	0.029	9,002	0.30	5,475	0.02	0.02	670,000	298	OEHHA Acute REL	0.00005
ACETYLENE	74-86-2	0.112	9,002	0.94	5,475	0.22	0.22	NR	25,000	TCEQ Short-Term AMCV	0.00001
BENZENE	71-43-2	0.05	9,002	0.91	5,475	0.24	0.30	52,000	9	ATSDR Acute MRL	0.03293
BUTANES*	75-28-5	0.421	9,002	4.13	5,475	2.54	2.68	NR	33000	TCEQ Short-Term AMCV	0.00008
BUTENES*	590-18-1	0.405	9,002	2.44	5,475	1.79	1.89	NR	15000	TCEQ Short-Term AMCV	0.00013
CARBON DISULFIDE	75-15-0	0.033	9,002	0.09	5,475	0.02	0.02	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANES*	287-92-3	0.107	9,002	2.63	5,475	0.51	0.79	NR	5,900	TCEQ Short-Term AMCV	0.00013
DECANES	124-18-5	0.023	9,002	0.11	5,475	0.02	0.03	NR	1,000	TCEQ Short-Term AMCV	0.00003
DIETHYLBENZENES*	141-93-5	0.026	9,002	0.17	5,475	0.11	0.11	NR	450	TCEQ Short-Term AMCV	0.00025
DIMETHYLCYCLOHEXANES*	638-04-0	0.036	9,002	0.10	5,475	0.07	0.07	NR	4,000	CDPHE	0.00002
DODECANES	112-40-3	0.001	9,002	0.05	5,475	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	0.164	9,002	45.29	5,475	6.72	6.84	NR	500,000	TCEQ Short-Term AMCV	0.00001
HEPTANES*	142-82-5	0.052	9,002	0.14	5,475	0.10	0.11	NR	8,300	TCEQ Short-Term AMCV	0.00001
HEXANES*	110-54-3	0.07	9,002	0.58	5,475	0.29	0.31	NR	5,400	TCEQ Short-Term AMCV	0.00006
HEXENES*	592-41-6	0.056	9,002	1.49	5,475	0.90	0.95	NR	500	TCEQ Short-Term AMCV	0.00190
HYDROGEN CYANIDE	74-90-8	0.06	9,002	0.30	5,475	0.18	0.19	2,000	308	OEHHA Acute REL	0.00060
HYDROGEN SULFIDE	7783-06-4	0.146	9,002	0.41	5,475	0.09	0.10	510	70	ATSDR Acute MRL	0.00149
ISOPRENE	78-79-5	0.08	9,002	0.19	5,475	0.13	0.13	NR	1,400	TCEQ Short-Term AMCV	0.00009
METHANOL	67-56-1	0.208	9,002	7.68	5,475	4.81	5.00	530,000	21,366	OEHHA Acute REL	0.00023
METHYLCYCLOHEXANE	108-87-2	0.053	9,002	0.08	5,475	0.04	0.04	NR	4,000	TCEQ Short-Term AMCV	0.00001
NONANES	111-84-2	0.019	9,002	0.12	5,475	0.05	0.06	NR	3,000	TCEQ Short-Term AMCV	0.00002
OCTANES*	111-65-9	0.025	9,002	0.16	5,475	0.08	0.09	NR	4,100	TCEQ Short-Term AMCV	0.00002
PENTANES*	109-66-0	0.046	9,002	3.51	5,475	0.53	0.59	NR	68,000	TCEQ Short-Term AMCV	0.00001
PROPYLENE	115-07-1	0.183	9,002	1.48	5,475	0.53	0.67	NR	NA	NA	
STYRENE	100-42-5	0.07	9,002	0.17	5,475	0.09	0.11	20,000	5,000	ATSDR Acute MRL	0.00002
TETRACHLOROETHYLENE	127-18-4	0.001	9,002	0.04	5,475	0.00	0.00	35,000	6	ATSDR Acute MRL	0.00067
TOLUENE	108-88-3	0.056	9,002	2.17	5,475	0.86	0.95	67,000	2,000	ATSDR Acute MRL	0.00048
TRIMETHYLBENZENES*	622-96-8	0.032	9,002	0.87	5,475	0.39	0.42	50,000	250	TCEQ Short-Term AMCV	0.00167
UNDECANES	1120-21-4	0.018	9,002	0.06	5,475	0.02	0.02	NR	550	TCEQ Short-Term AMCV	0.00004
XYLENES*	1330-20-7	0.068	9,002	2.41	5,475	1.29	1.48	130,000	2,000	ATSDR Acute MRL	0.00074
										Hazard Index	**0.04172**

The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average.
*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.
CDPHE = Colorado Department of Public Health and Environment; **TCEQ** = Texas Commission on Environmental Quality; **ATSDR** = Agency for Toxic Substances and Disease Registry; **OEHHA** = California Office of Environmental Health Hazard Assessment
MRL = Minimal Risk Level; **REL** = Reference Exposure Level; **AMCV** = Air Monitoring Comparison Values; **AEGL** = Acute Exposure Guideline Levels
ppbv = parts per billion volume
NA = Not Available
NR = According to EPA, AEGL is "Not Recommended due to insufficient data."

Mobile Laboratory Sampling Data Summary and Risk Assessment | 2024 Q4

Globeville Neighborhood | November 20, 2024

Analyte	Cas No	Method Detection Limit (ppbv)	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	0.029	9,005	0.43	5,478	0.02	0.02	670,000	298	OEHHA Acute REL	0.00005
ACETYLENE	74-86-2	0.112	9,005	0.75	5,478	0.20	0.21	NR	25,000	TCEQ Short-Term AMCV	0.00001
BENZENE	71-43-2	0.05	9,005	11.58	5,478	0.23	0.27	52,000	9	ATSDR Acute MRL	0.02948
BUTANES*	75-28-5	0.421	9,005	26.89	5,478	2.71	2.77	NR	33000	TCEQ Short-Term AMCV	0.00008
BUTENES*	590-18-1	0.405	9,005	6.92	5,478	0.87	0.90	NR	15000	TCEQ Short-Term AMCV	0.00006
CARBON DISULFIDE	75-15-0	0.033	9,005	0.10	5,478	0.02	0.02	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANES*	287-92-3	0.107	9,005	17.61	5,478	1.68	1.74	NR	5,900	TCEQ Short-Term AMCV	0.00030
DECANES	124-18-5	0.023	9,005	0.14	5,478	0.06	0.06	NR	1,000	TCEQ Short-Term AMCV	0.00006
DIETHYLBENZENES*	141-93-5	0.026	9,005	0.13	5,478	0.04	0.04	NR	450	TCEQ Short-Term AMCV	0.00009
DIMETHYLCYCLOHEXANES*	638-04-0	0.036	9,005	0.26	5,478	0.02	0.02	NR	4,000	CDPHE	0.00000
DODECANES	112-40-3	0.001	9,005	0.04	5,478	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	0.164	9,005	52.95	5,478	6.90	7.13	NR	500,000	TCEQ Short-Term AMCV	0.00001
HEPTANES*	142-82-5	0.052	9,005	0.06	5,478	0.03	0.03	NR	8,300	TCEQ Short-Term AMCV	0.00000
HEXANES*	110-54-3	0.07	9,005	0.26	5,478	0.09	0.10	NR	5,400	TCEQ Short-Term AMCV	0.00002
HEXENES*	592-41-6	0.056	9,005	3.42	5,478	0.25	0.26	NR	500	TCEQ Short-Term AMCV	0.00052
HYDROGEN CYANIDE	74-90-8	0.06	9,005	0.29	5,478	0.10	0.12	2,000	308	OEHHA Acute REL	0.00038
HYDROGEN SULFIDE	7783-06-4	0.146	9,005	0.27	5,478	0.07	0.07	510	70	ATSDR Acute MRL	0.00105
ISOPRENE	78-79-5	0.08	9,005	0.21	5,478	0.04	0.04	NR	1,400	TCEQ Short-Term AMCV	0.00003
METHANOL	67-56-1	0.208	9,005	16.71	5,478	3.84	4.00	530,000	21,366	OEHHA Acute REL	0.00019
METHYLCYCLOHEXANE	108-87-2	0.053	9,005	0.16	5,478	0.07	0.07	NR	4,000	TCEQ Short-Term AMCV	0.00002
NONANES	111-84-2	0.019	9,005	0.13	5,478	0.03	0.03	NR	3,000	TCEQ Short-Term AMCV	0.00001
OCTANES*	111-65-9	0.025	9,005	0.09	5,478	0.03	0.03	NR	4,100	TCEQ Short-Term AMCV	0.00001
PENTANES*	109-66-0	0.046	9,005	3.56	5,478	0.48	0.51	NR	68,000	TCEQ Short-Term AMCV	0.00001
PROPYLENE	115-07-1	0.183	9,005	8.49	5,478	0.71	0.75	NR	NA	NA	
STYRENE	100-42-5	0.07	9,005	1.29	5,478	0.04	0.04	20,000	5,000	ATSDR Acute MRL	0.00001
TETRACHLOROETHYLENE	127-18-4	0.001	9,005	0.05	5,478	0.00	0.00	35,000	6	ATSDR Acute MRL	0.00038
TOLUENE	108-88-3	0.056	9,005	36.85	5,478	0.92	1.11	67,000	2,000	ATSDR Acute MRL	0.00055
TRIMETHYLBENZENES*	622-96-8	0.032	9,005	8.03	5,478	0.26	0.31	50,000	250	TCEQ Short-Term AMCV	0.00124
UNDECANES	1120-21-4	0.018	9,005	0.06	5,478	0.02	0.02	NR	550	TCEQ Short-Term AMCV	0.00004
XYLENES*	1330-20-7	0.068	9,005	24.54	5,478	1.13	1.18	130,000	2,000	ATSDR Acute MRL	0.00059
										Hazard Index	**0.03518**

The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average.
*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.
CDPHE = Colorado Department of Public Health and Environment; **TCEQ** = Texas Commission on Environmental Quality; **ATSDR** = Agency for Toxic Substances and Disease Registry; **OEHHA** = California Office of Environmental Health Hazard Assessment
MRL = Minimal Risk Level; **REL** = Reference Exposure Level; **AMCV** = Air Monitoring Comparison Values; **AEGL** = Acute Exposure Guideline Levels
ppbv = parts per billion volume
NA = Not Available
NR = According to EPA, AEGL is "Not Recommended due to insufficient data."

Mobile Laboratory Sampling Data Summary and Risk Assessment | 2024 Q4

Pioneer Park Neighborhood | November 18, 2024

Analyte	Cas No	Method Detection Limit (ppbv)	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	0.029	10,767	0.78	7,240	0.02	0.02	670,000	298	OEHHA Acute REL	0.00007
ACETYLENE	74-86-2	0.112	10,767	1.21	7,240	0.18	0.19	NR	25,000	TCEQ Short-Term AMCV	0.00001
BENZENE	71-43-2	0.05	10,767	2.34	7,240	0.18	0.23	52,000	9	ATSDR Acute MRL	0.02574
BUTANES*	75-28-5	0.421	10,767	23.37	7,240	2.44	2.73	NR	33000	TCEQ Short-Term AMCV	0.00008
BUTENES*	590-18-1	0.405	10,767	6.16	7,240	2.73	2.76	NR	15000	TCEQ Short-Term AMCV	0.00018
CARBON DISULFIDE	75-15-0	0.033	10,767	0.19	7,240	0.02	0.02	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANES*	287-92-3	0.107	10,767	11.04	7,240	1.79	1.87	NR	5,900	TCEQ Short-Term AMCV	0.00032
DECANES	124-18-5	0.023	10,767	0.23	7,240	0.03	0.03	NR	1,000	TCEQ Short-Term AMCV	0.00003
DIETHYLBENZENES*	141-93-5	0.026	10,767	0.15	7,240	0.07	0.07	NR	450	TCEQ Short-Term AMCV	0.00016
DIMETHYLCYCLOHEXANES*	638-04-0	0.036	10,767	0.08	7,240	0.02	0.02	NR	4,000	CDPHE	0.00000
DODECANES	112-40-3	0.001	10,767	0.09	7,240	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	0.164	10,767	70.89	7,240	5.86	6.52	NR	500,000	TCEQ Short-Term AMCV	0.00001
HEPTANES*	142-82-5	0.052	10,767	0.08	7,240	0.03	0.03	NR	8,300	TCEQ Short-Term AMCV	0.00000
HEXANES*	110-54-3	0.07	10,767	0.30	7,240	0.11	0.12	NR	5,400	TCEQ Short-Term AMCV	0.00002
HEXENES*	592-41-6	0.056	10,767	3.04	7,240	0.84	0.86	NR	500	TCEQ Short-Term AMCV	0.00172
HYDROGEN CYANIDE	74-90-8	0.06	10,767	0.38	7,240	0.20	0.24	2,000	308	OEHHA Acute REL	0.00076
HYDROGEN SULFIDE	7783-06-4	0.146	10,767	0.22	7,240	0.07	0.07	510	70	ATSDR Acute MRL	0.00104
ISOPRENE	78-79-5	0.08	10,767	0.17	7,240	0.05	0.05	NR	1,400	TCEQ Short-Term AMCV	0.00004
METHANOL	67-56-1	0.208	10,767	10.26	7,240	3.98	4.23	530,000	21,366	OEHHA Acute REL	0.00020
METHYLCYCLOHEXANE	108-87-2	0.053	10,767	0.10	7,240	0.03	0.03	NR	4,000	TCEQ Short-Term AMCV	0.00001
NONANES	111-84-2	0.019	10,767	0.20	7,240	0.01	0.02	NR	3,000	TCEQ Short-Term AMCV	0.00001
OCTANES*	111-65-9	0.025	10,767	0.13	7,240	0.04	0.04	NR	4,100	TCEQ Short-Term AMCV	0.00001
PENTANES*	109-66-0	0.046	10,767	6.72	7,240	0.47	0.51	NR	68,000	TCEQ Short-Term AMCV	0.00001
PROPYLENE	115-07-1	0.183	10,767	2.67	7,240	0.48	0.64	NR	NA	NA	
STYRENE	100-42-5	0.07	10,767	0.06	7,240	0.04	0.04	20,000	5,000	ATSDR Acute MRL	0.00001
TETRACHLOROETHYLENE	127-18-4	0.001	10,767	0.08	7,240	0.00	0.00	35,000	6	ATSDR Acute MRL	0.00032
TOLUENE	108-88-3	0.056	10,767	3.80	7,240	0.87	0.98	67,000	2,000	ATSDR Acute MRL	0.00049
TRIMETHYLBENZENES*	622-96-8	0.032	10,767	1.34	7,240	0.19	0.23	50,000	250	TCEQ Short-Term AMCV	0.00093
UNDECANES	1120-21-4	0.018	10,767	0.10	7,240	0.01	0.01	NR	550	TCEQ Short-Term AMCV	0.00002
XYLENES*	1330-20-7	0.068	10,767	3.10	7,240	0.60	0.69	130,000	2,000	ATSDR Acute MRL	0.00035
										Hazard Index	**0.03255**

The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average.
*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.
CDPHE = Colorado Department of Public Health and Environment; **TCEQ** = Texas Commission on Environmental Quality; **ATSDR** = Agency for Toxic Substances and Disease Registry; **OEHHA** = California Office of Environmental Health Hazard Assessment
MRL = Minimal Risk Level; **REL** = Reference Exposure Level; **AMCV** = Air Monitoring Comparison Values; **AEGL** = Acute Exposure Guideline Levels
ppbv = parts per billion volume
NA = Not Available
NR = According to EPA, AEGL is "Not Recommended due to insufficient data."

Mobile Laboratory Sampling Data Summary and Risk Assessment | 2024 Q4

Western Hills Neighborhood | November 20, 2024

Analyte	Cas No	Method Detection Limit (ppbv)	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	0.029	10,586	0.35	7,059	0.02	0.02	670,000	298	OEHHA Acute REL	0.00005
ACETYLENE	74-86-2	0.112	10,586	0.75	7,059	0.10	0.11	NR	25,000	TCEQ Short-Term AMCV	0.00000
BENZENE	71-43-2	0.05	10,586	4.61	7,059	0.27	0.33	52,000	9	ATSDR Acute MRL	0.03615
BUTANES*	75-28-5	0.421	10,586	13.23	7,059	2.07	2.40	NR	33000	TCEQ Short-Term AMCV	0.00007
BUTENES*	590-18-1	0.405	10,586	5.15	7,059	1.21	1.30	NR	15000	TCEQ Short-Term AMCV	0.00009
CARBON DISULFIDE	75-15-0	0.033	10,586	0.14	7,059	0.02	0.02	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANES*	287-92-3	0.107	10,586	11.35	7,059	1.49	1.62	NR	5,900	TCEQ Short-Term AMCV	0.00028
DECANES	124-18-5	0.023	10,586	0.14	7,059	0.05	0.05	NR	1,000	TCEQ Short-Term AMCV	0.00005
DIETHYLBENZENES*	141-93-5	0.026	10,586	0.09	7,059	0.03	0.03	NR	450	TCEQ Short-Term AMCV	0.00008
DIMETHYLCYCLOHEXANES*	638-04-0	0.036	10,586	0.25	7,059	0.02	0.02	NR	4,000	CDPHE	0.00000
DODECANES	112-40-3	0.001	10,586	0.05	7,059	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	0.164	10,586	50.07	7,059	8.27	8.67	NR	500,000	TCEQ Short-Term AMCV	0.00002
HEPTANES*	142-82-5	0.052	10,586	0.06	7,059	0.03	0.03	NR	8,300	TCEQ Short-Term AMCV	0.00000
HEXANES*	110-54-3	0.07	10,586	0.49	7,059	0.20	0.21	NR	5,400	TCEQ Short-Term AMCV	0.00004
HEXENES*	592-41-6	0.056	10,586	2.83	7,059	0.23	0.26	NR	500	TCEQ Short-Term AMCV	0.00051
HYDROGEN CYANIDE	74-90-8	0.06	10,586	0.30	7,059	0.16	0.18	2,000	308	OEHHA Acute REL	0.00059
HYDROGEN SULFIDE	7783-06-4	0.146	10,586	0.41	7,059	0.07	0.07	510	70	ATSDR Acute MRL	0.00106
ISOPRENE	78-79-5	0.08	10,586	0.32	7,059	0.04	0.04	NR	1,400	TCEQ Short-Term AMCV	0.00003
METHANOL	67-56-1	0.208	10,586	24.41	7,059	2.73	3.05	530,000	21,366	OEHHA Acute REL	0.00014
METHYLCYCLOHEXANE	108-87-2	0.053	10,586	0.09	7,059	0.03	0.03	NR	4,000	TCEQ Short-Term AMCV	0.00001
NONANES	111-84-2	0.019	10,586	0.12	7,059	0.03	0.03	NR	3,000	TCEQ Short-Term AMCV	0.00001
OCTANES*	111-65-9	0.025	10,586	0.12	7,059	0.02	0.04	NR	4,100	TCEQ Short-Term AMCV	0.00001
PENTANES*	109-66-0	0.046	10,586	3.77	7,059	0.48	0.49	NR	68,000	TCEQ Short-Term AMCV	0.00001
PROPYLENE	115-07-1	0.183	10,586	7.60	7,059	0.40	0.51	NR	NA	NA	
STYRENE	100-42-5	0.07	10,586	0.04	7,059	0.04	0.04	20,000	5,000	ATSDR Acute MRL	0.00001
TETRACHLOROETHYLENE	127-18-4	0.001	10,586	0.04	7,059	0.00	0.00	35,000	6	ATSDR Acute MRL	0.00015
TOLUENE	108-88-3	0.056	10,586	11.66	7,059	0.81	1.02	67,000	2,000	ATSDR Acute MRL	0.00051
TRIMETHYLBENZENES*	622-96-8	0.032	10,586	4.10	7,059	0.27	0.34	50,000	250	TCEQ Short-Term AMCV	0.00136
UNDECANES	1120-21-4	0.018	10,586	0.06	7,059	0.02	0.02	NR	550	TCEQ Short-Term AMCV	0.00003
XYLENES*	1330-20-7	0.068	10,586	6.98	7,059	0.57	0.67	130,000	2,000	ATSDR Acute MRL	0.00034
										Hazard Index	**0.04160**

The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average.
*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.
CDPHE = Colorado Department of Public Health and Environment; **TCEQ** = Texas Commission on Environmental Quality; **ATSDR** = Agency for Toxic Substances and Disease Registry; **OEHHA** = California Office of Environmental Health Hazard Assessment
MRL = Minimal Risk Level; **REL** = Reference Exposure Level; **AMCV** = Air Monitoring Comparison Values; **AEGL** = Acute Exposure Guideline Levels
ppbv = parts per billion volume
NA = Not Available
NR = According to EPA, AEGL is "Not Recommended due to insufficient data."

APPENDIX D PTR CALIBRATION AND QA/QC DATA

Observations During Mobile Van Monitoring

11-18-24 Pioneer Park Neighborhood
- 11:49 AM 11/18/2024 69th x Monaco BTEX spike, intersection exhaust
- 11:51 AM 11/18/2024 68th x Leyden BTEX spike exhaust
- 1:14 PM 11/18/2024 60th x Newport BTEX peak traffic

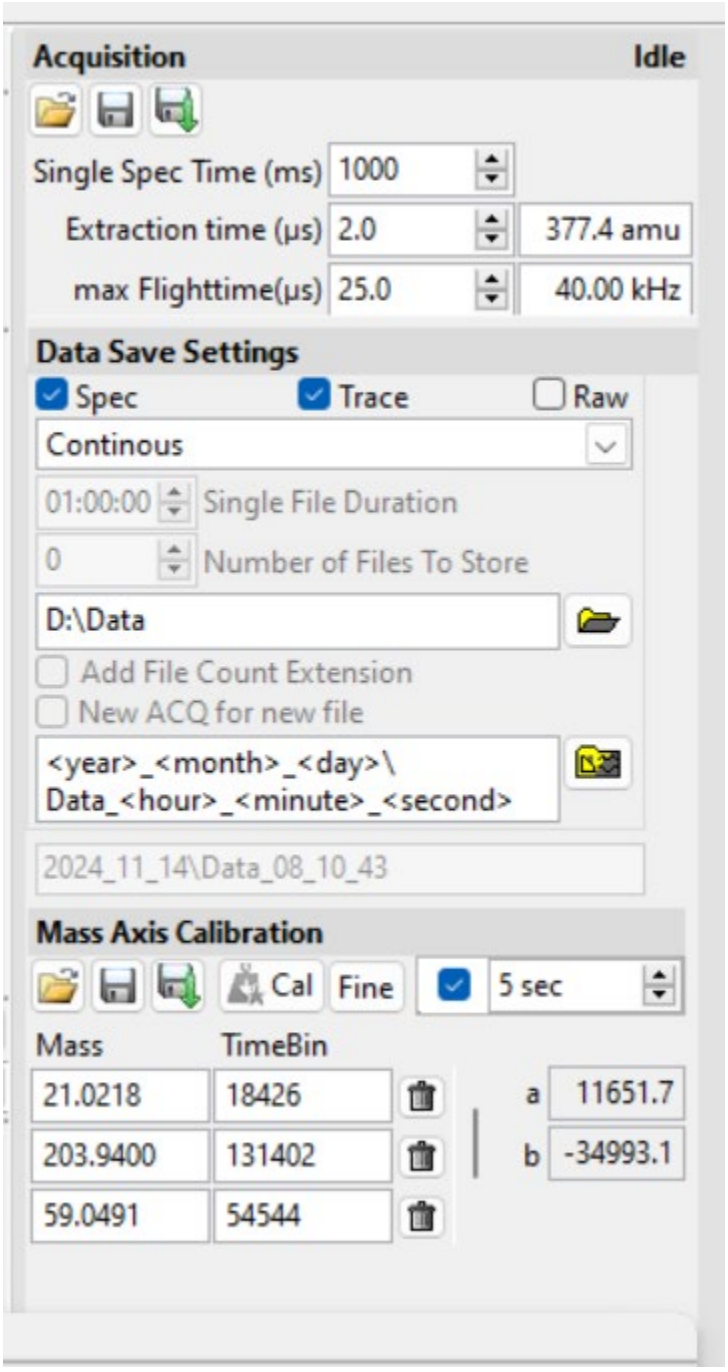
11-19-24 Dupont Neighborhood
- 9:38 AM 11/19/2024 Hollywood x 77th BTEX (gas station)
- 11:36 AM 11/19/2024 Jasmine x 70th BTEX Spike, intersection exhaust

11-19-24 Adams City Neighborhood
- 1:34 PM 11/19/2024 Dalilah x 74th BTEX Spike, intersection

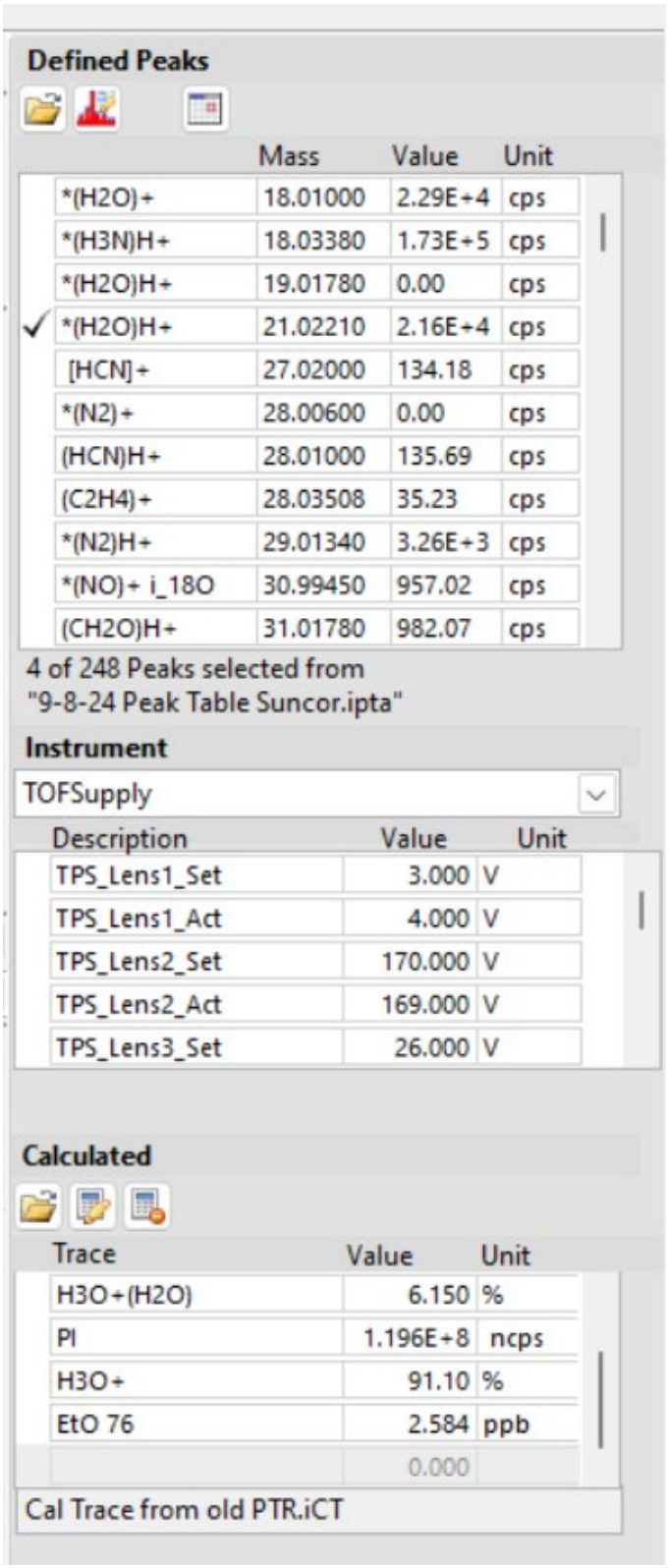
11-20-24 Western Hills Neighborhood
- 10:48 AM 11/20/2024 Huron x 70th, BTEX peak, intersection
- 10:52 AM 11/20/2024 Inca x Santa Fe, BTEX peak, intersection
- 11:16 AM 11/20/2024 70th Ave, BTEX Spikes , auto exhaust

11-20-24 Globeville Neighborhood
- 1:04 PM 11/20/2024 46th x Lincoln High BTEX spikes, old auto exhaust at intersection
- 1:19 PM 11/20/2024 43rd x Lincoln BTEX peak, intersection exhaust
- 1:36 PM 11/20/2024 53rd x Lincoln BTEX peak, exhaust
- 2:06 PM 11/20/2024 45th x Grant BTEX peak
- 2:17 PM 11/20/2024 Sherman x 45th BTEX

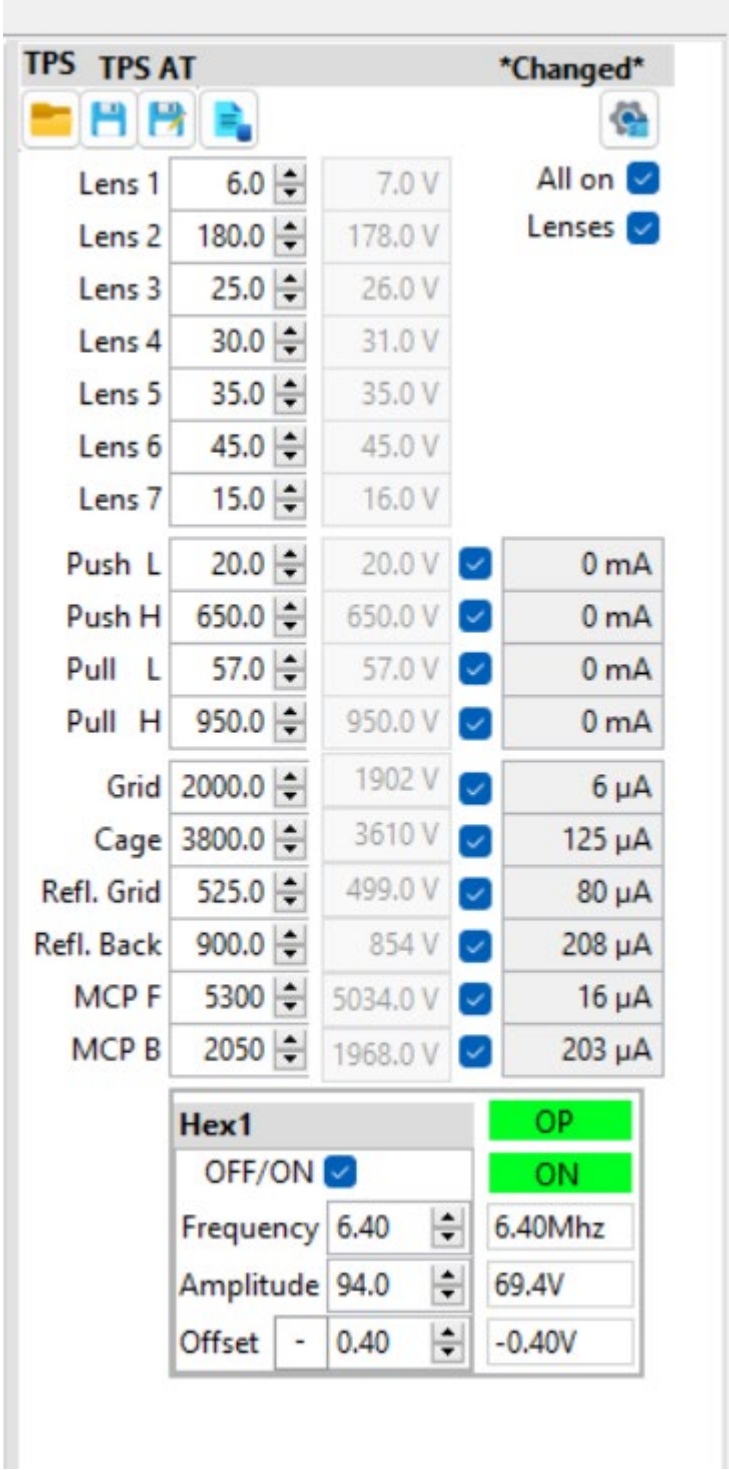
11-21-24 Elyria-Swansea Neighborhoods
- 10:47 AM 11/21/2024 Walnut x 40th BTEX peak, intersection exhaust



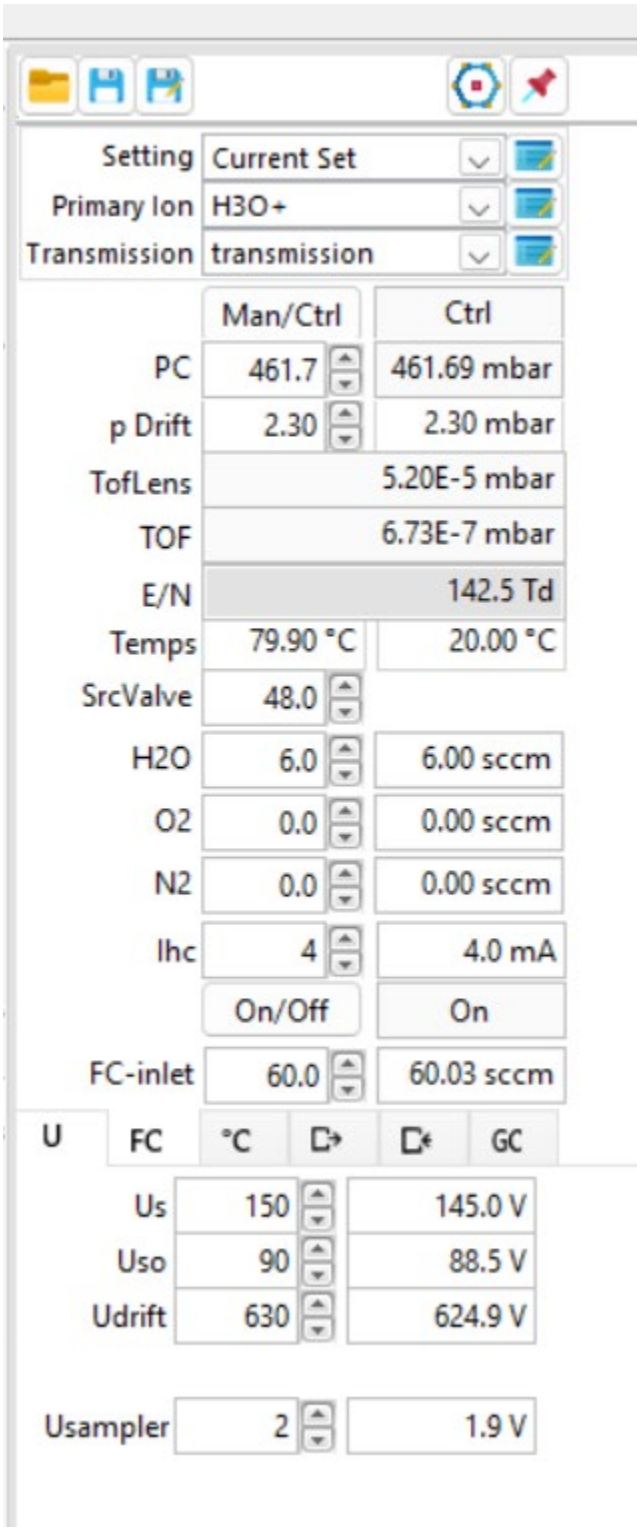
Acquisition Parameters



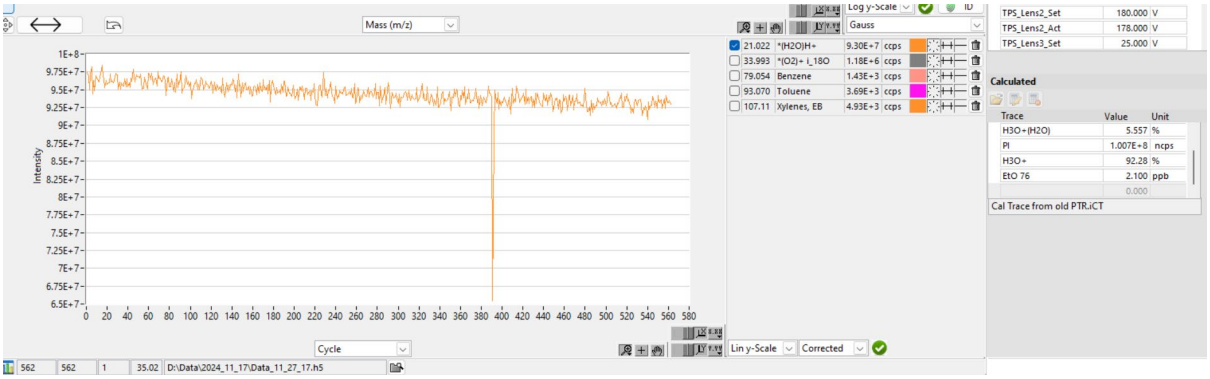
Peaks and Calculations



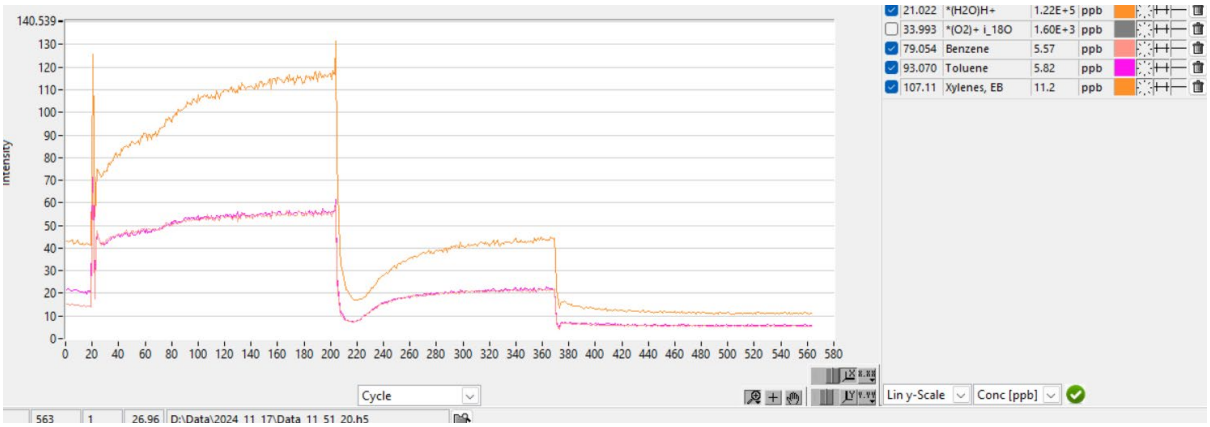
TPS Voltages and Hex settings



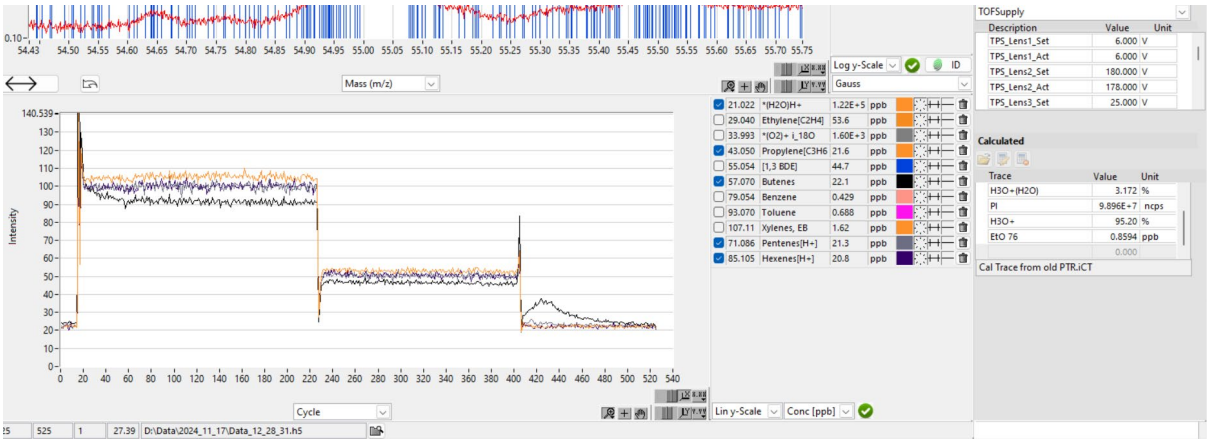
Production Settings



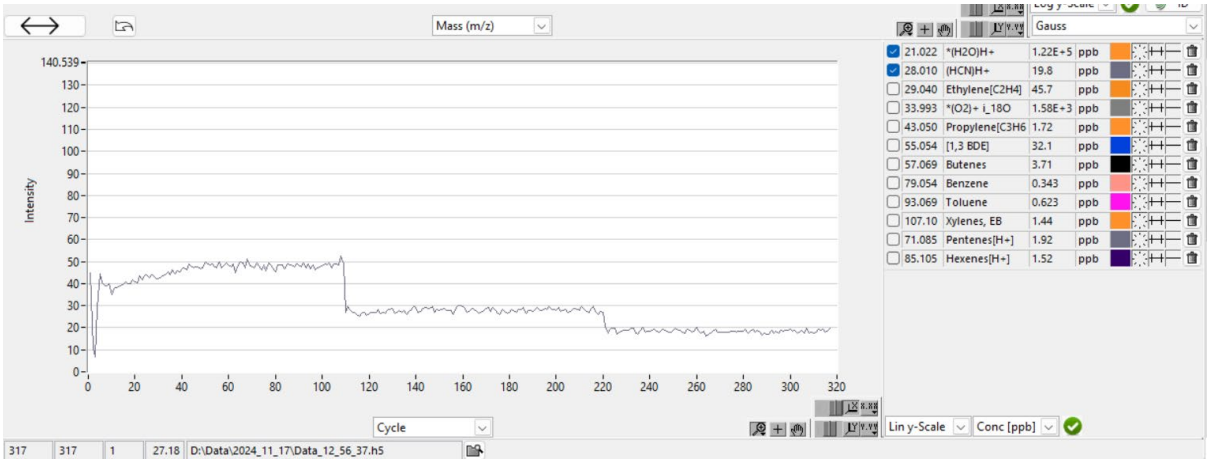
H3O+ stability check



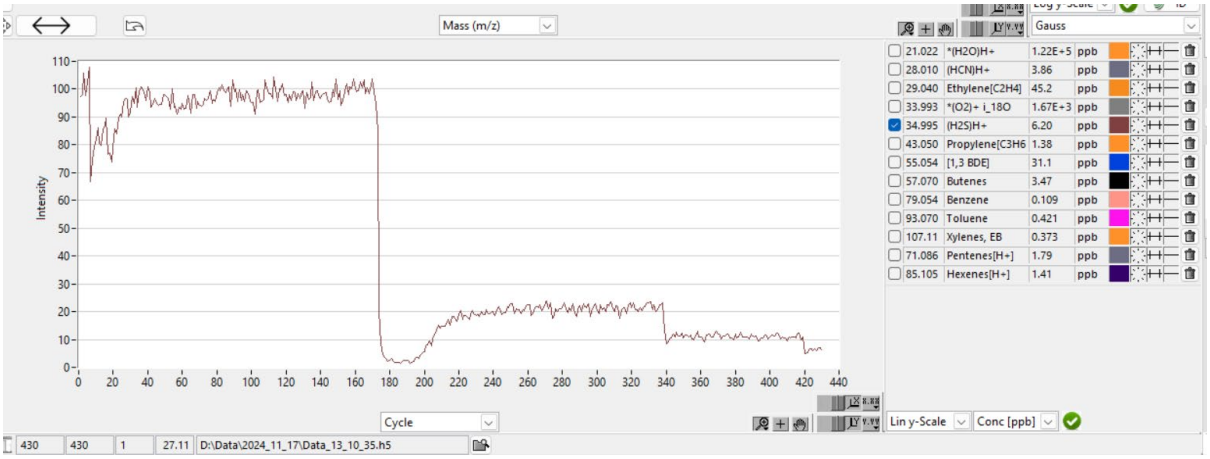
50, 20 and 5 ppb BTEX



100, 50 and 20 ppb Alkenes



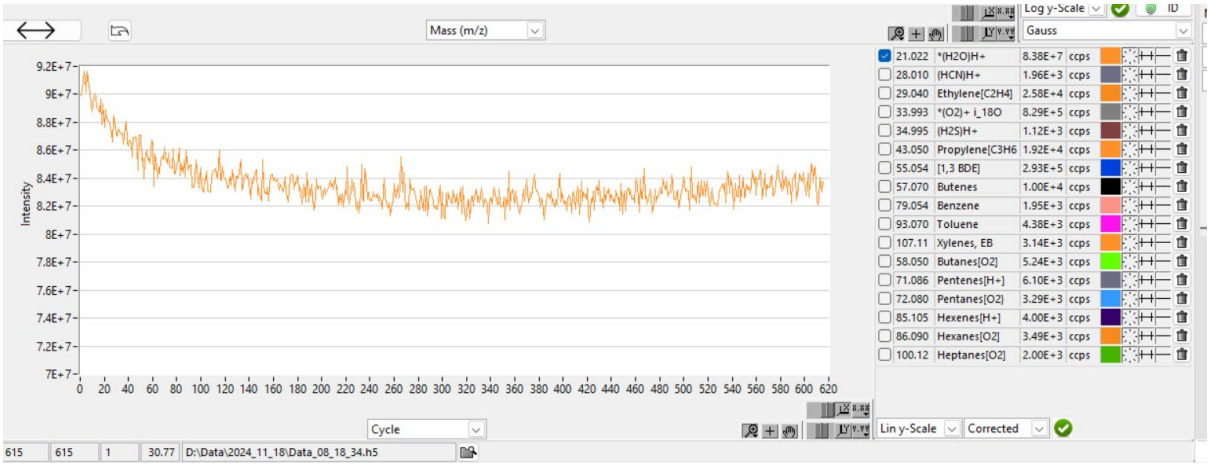
50, 25 and 10 ppb HCN



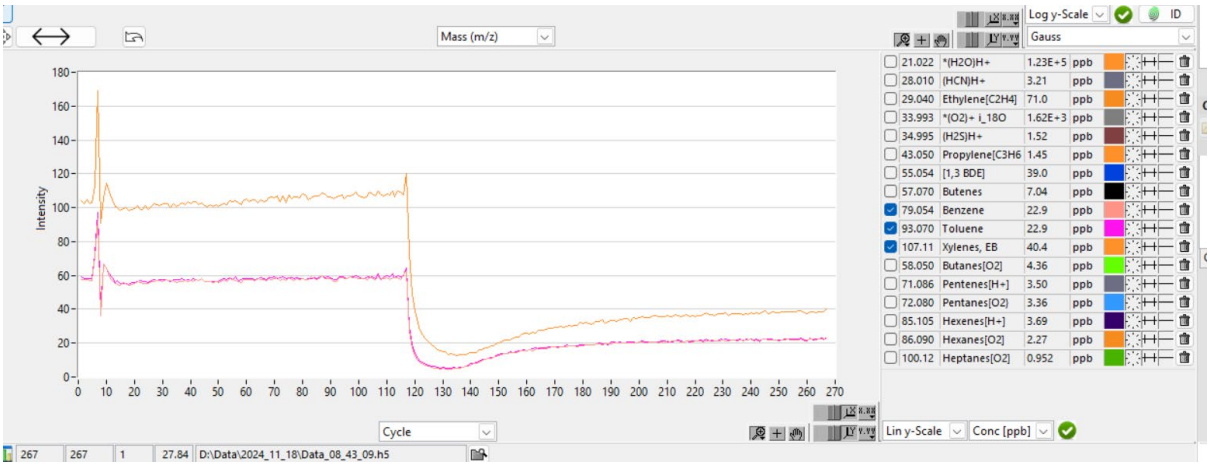
100, 20 and 10 ppb H2S

150, 100 and 50 ppb Alkanes

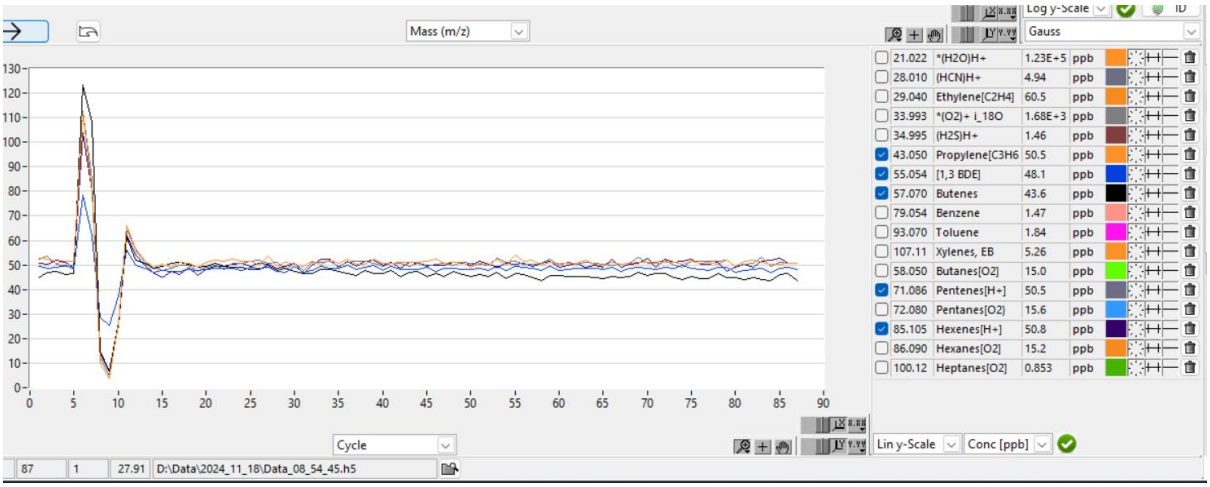
11/18/2024
Pioneer Park



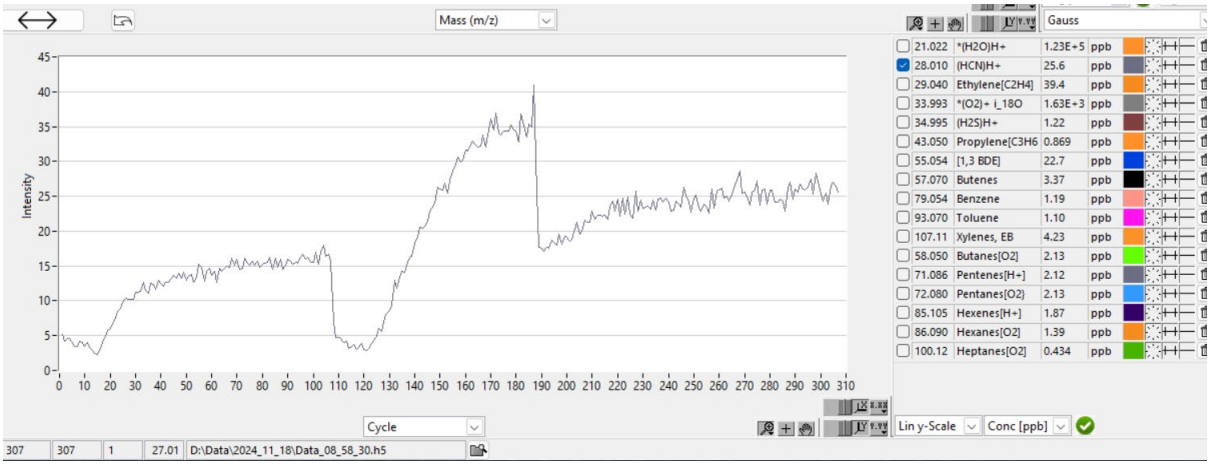
H3O+ stabilize



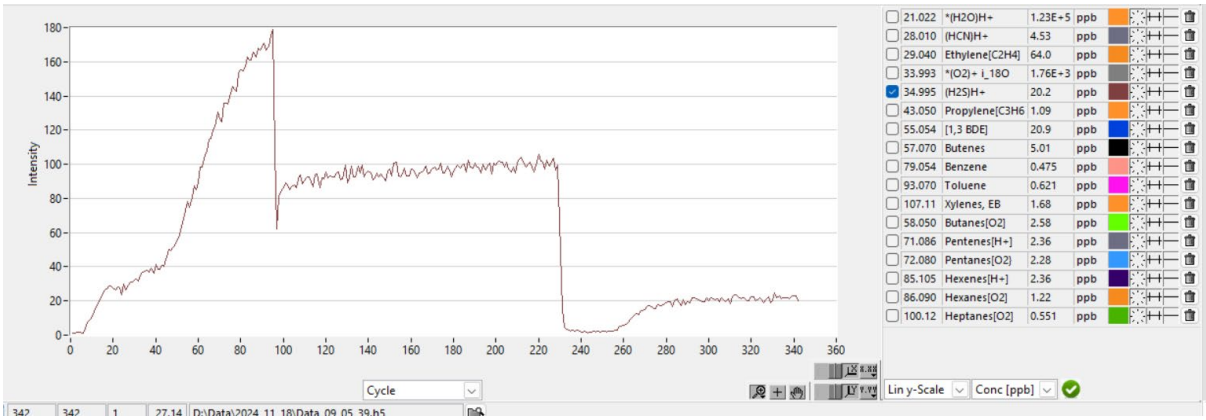
50 ppb and 20 ppb BTEX



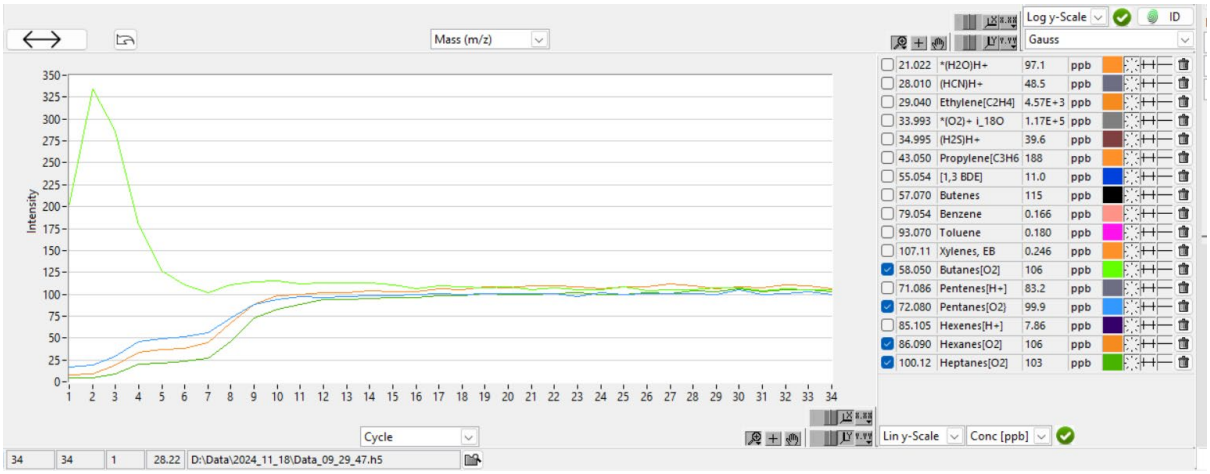
50ppb Alkenes



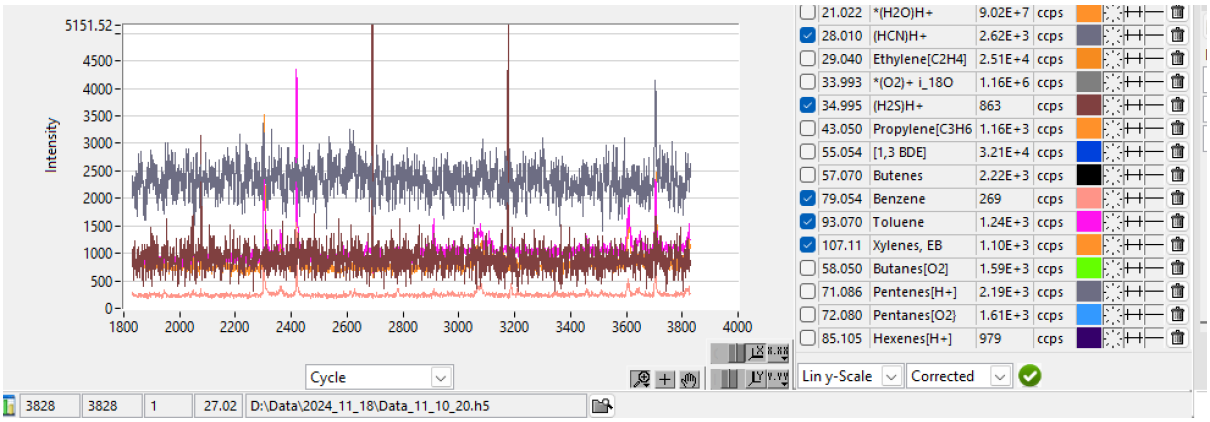
25 ppb of HCN



100 ppb and 20 ppb H2S

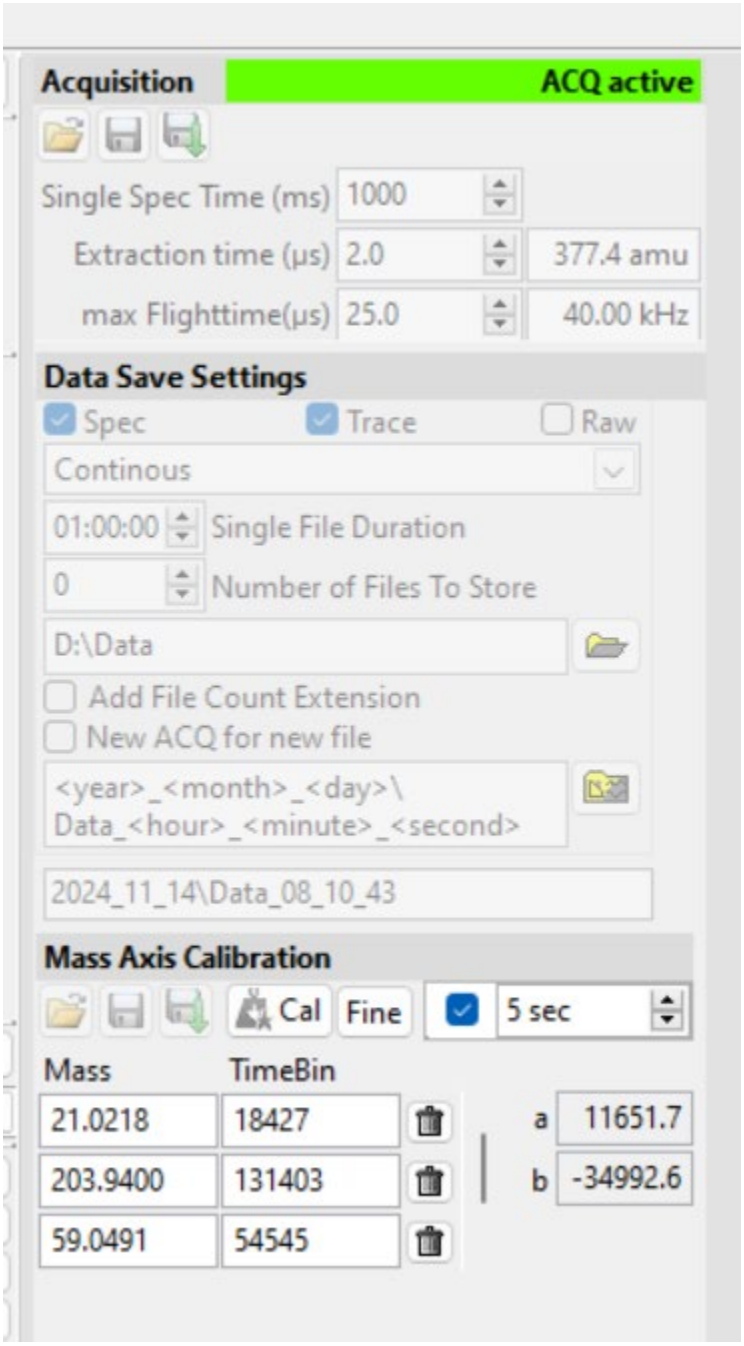


100 ppb Alkanes

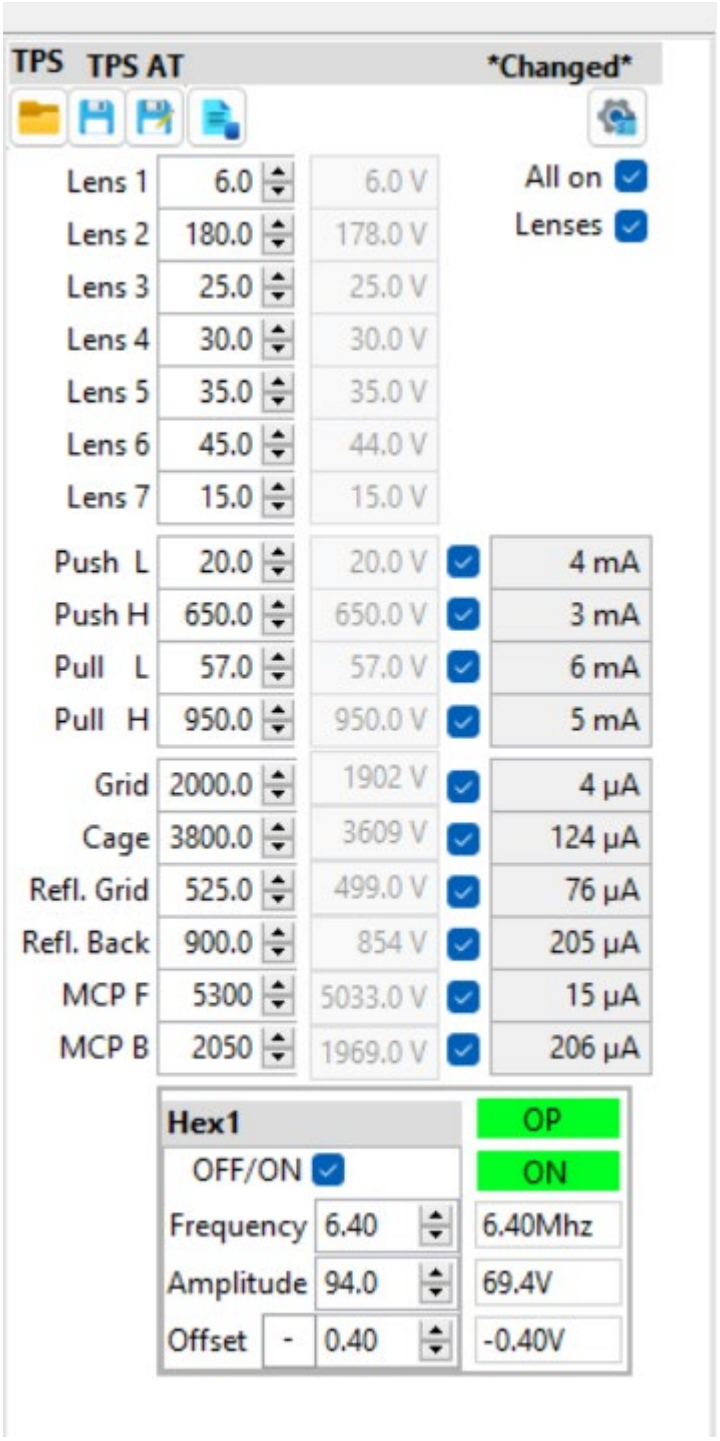


Screenshot during mobile testing at Pioneer Park

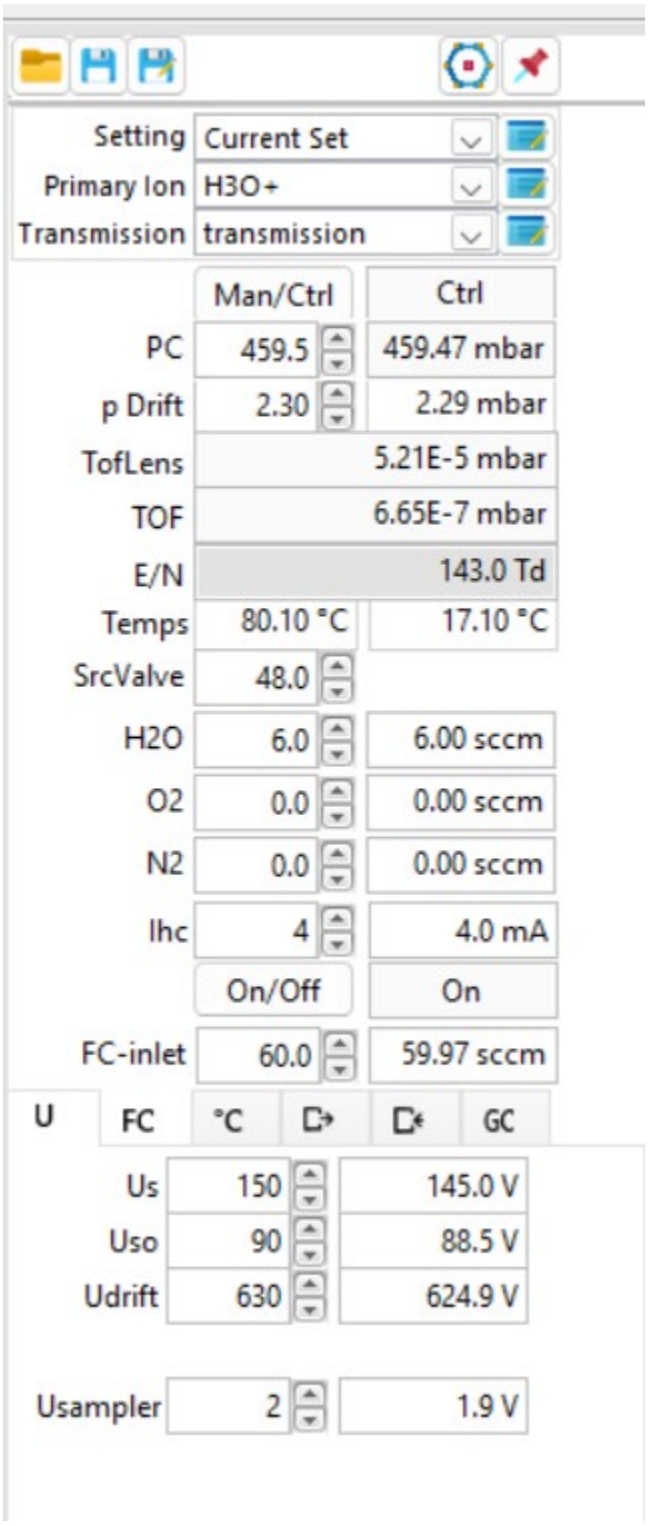
11/19/2024



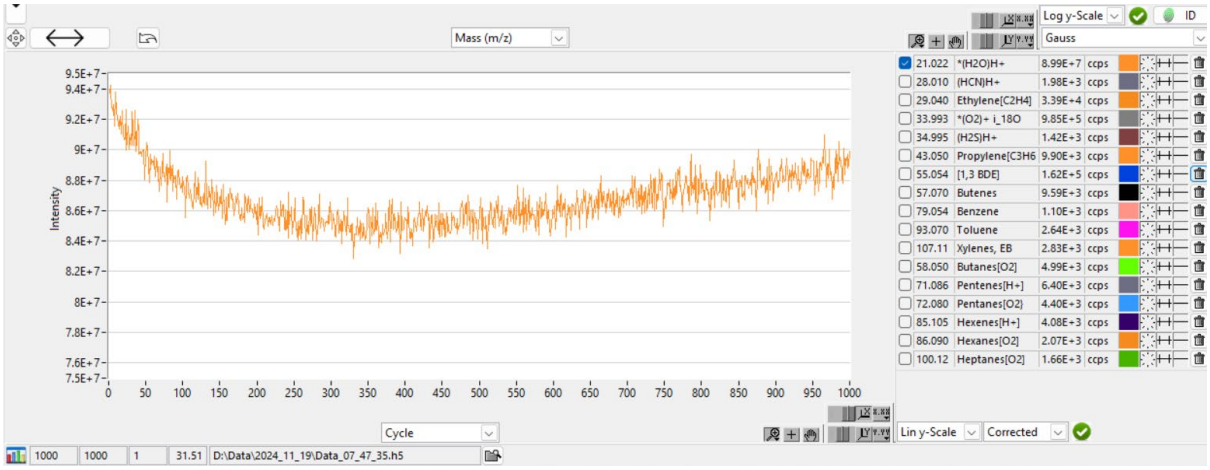
Acquisition Settings



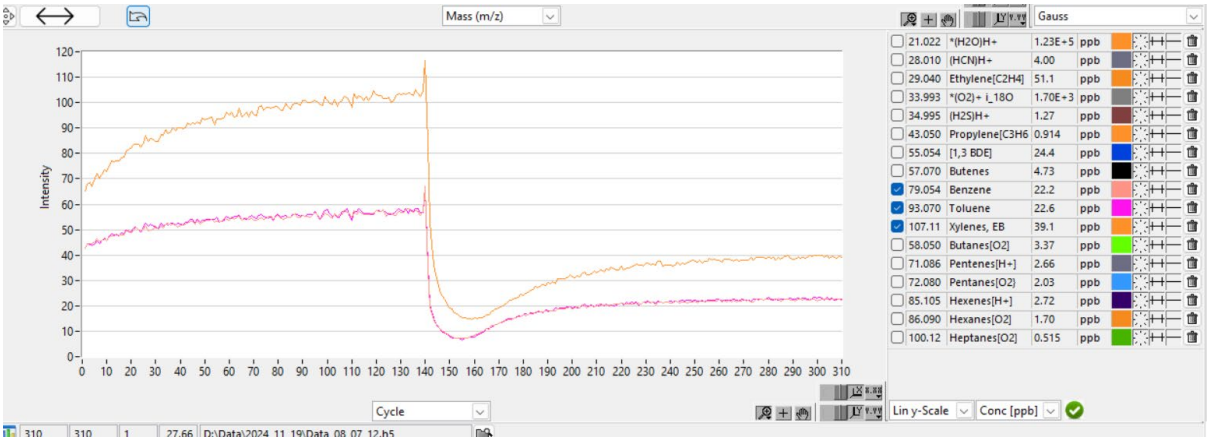
TPS Voltages and Hex Settings



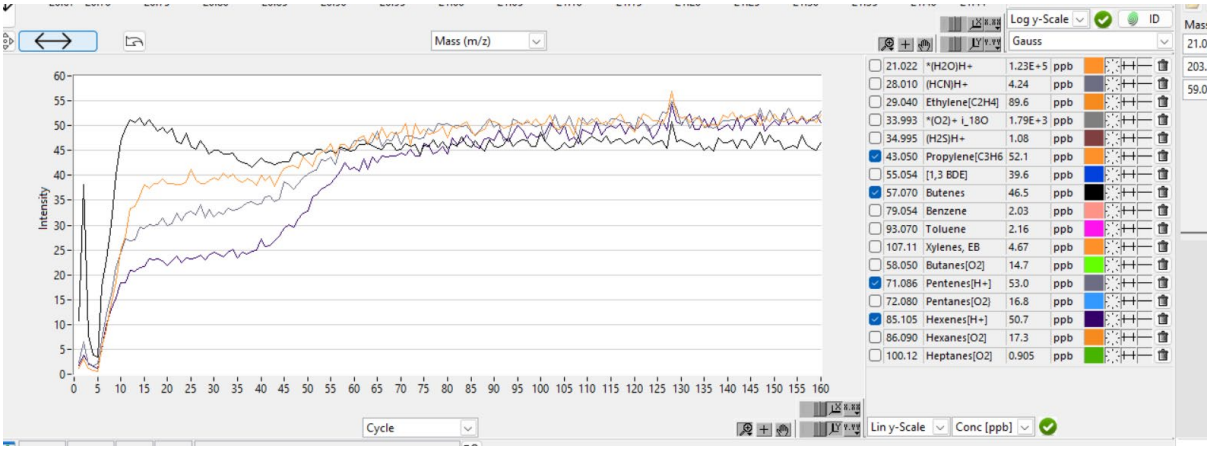
Production Settings



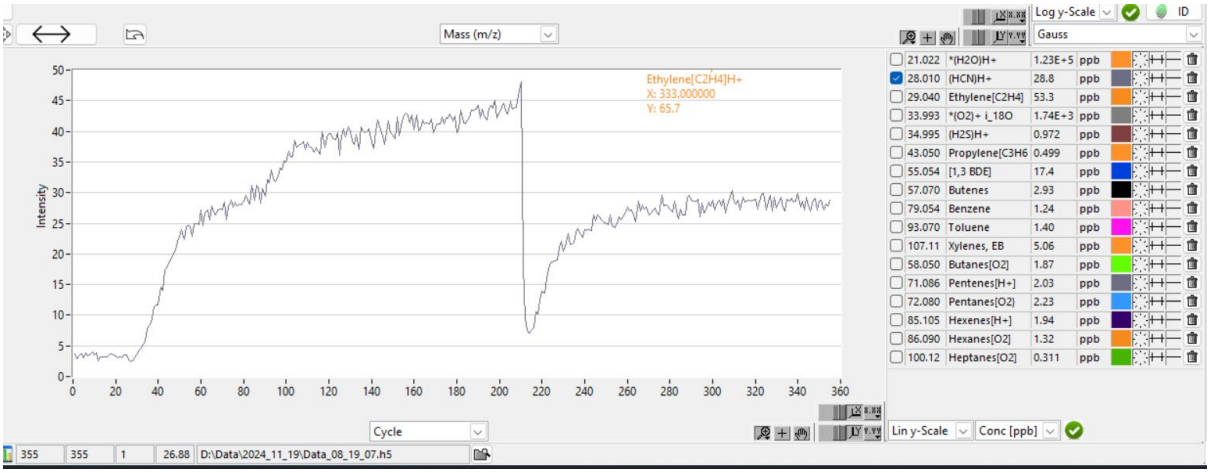
H3O+ stabilize



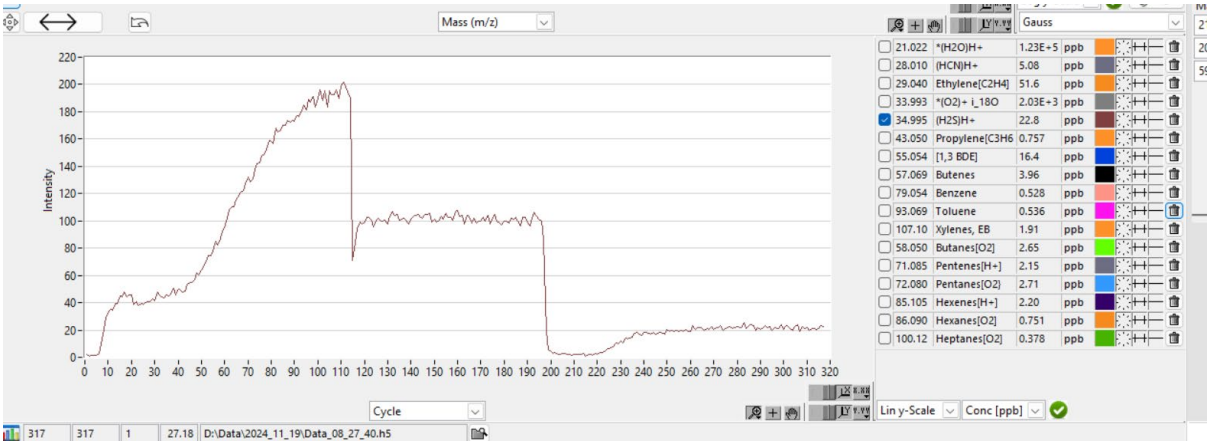
50 ppb and 20 ppb BTEX



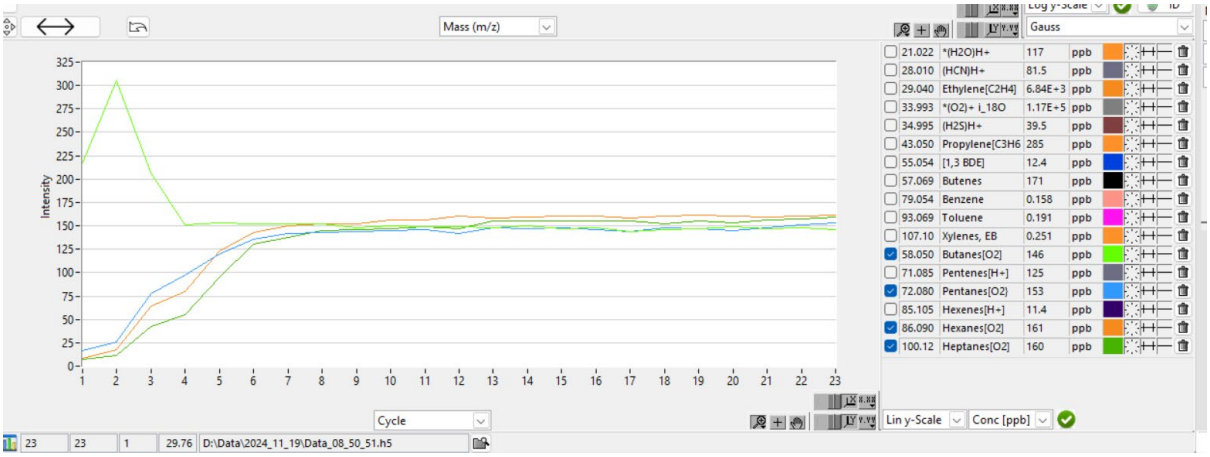
50 ppb Alkenes



25 ppb HCN

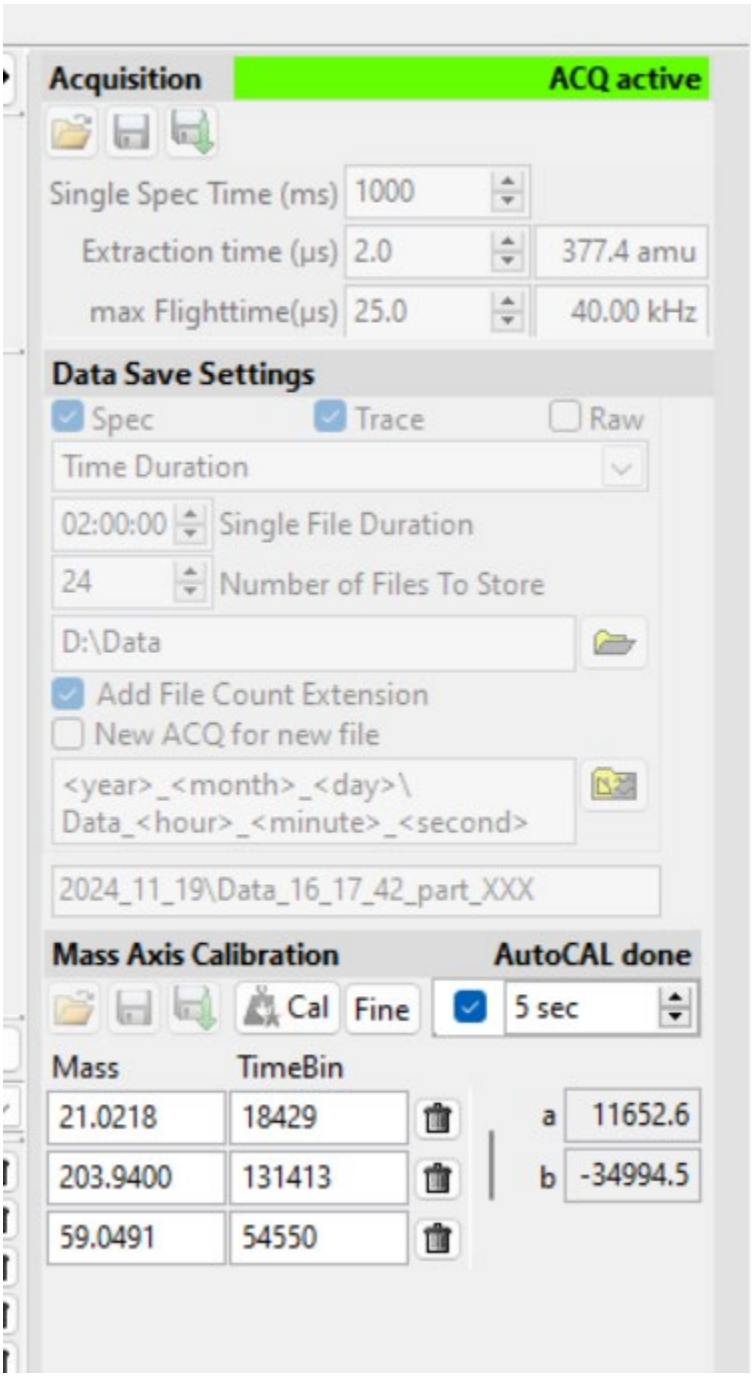


100 and 20 ppb H2S

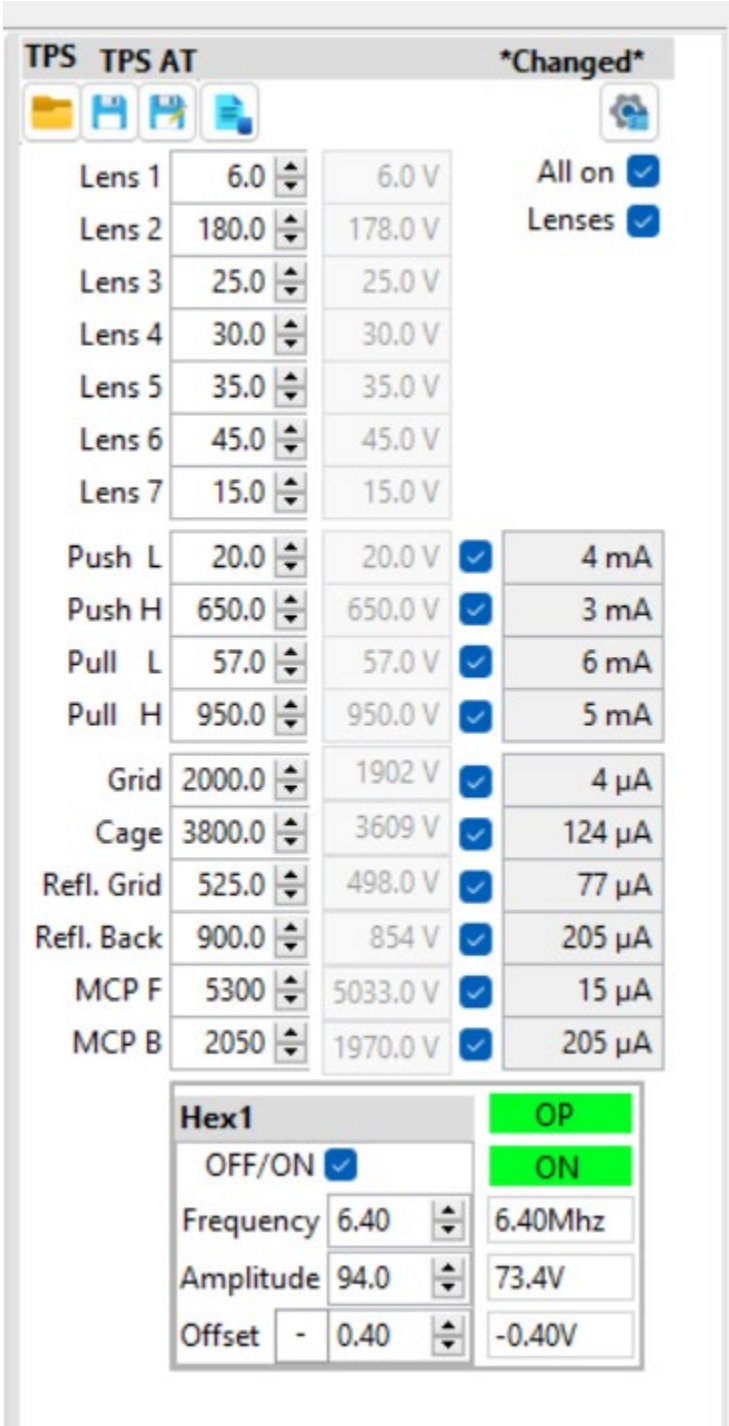


150 ppb Alkanes

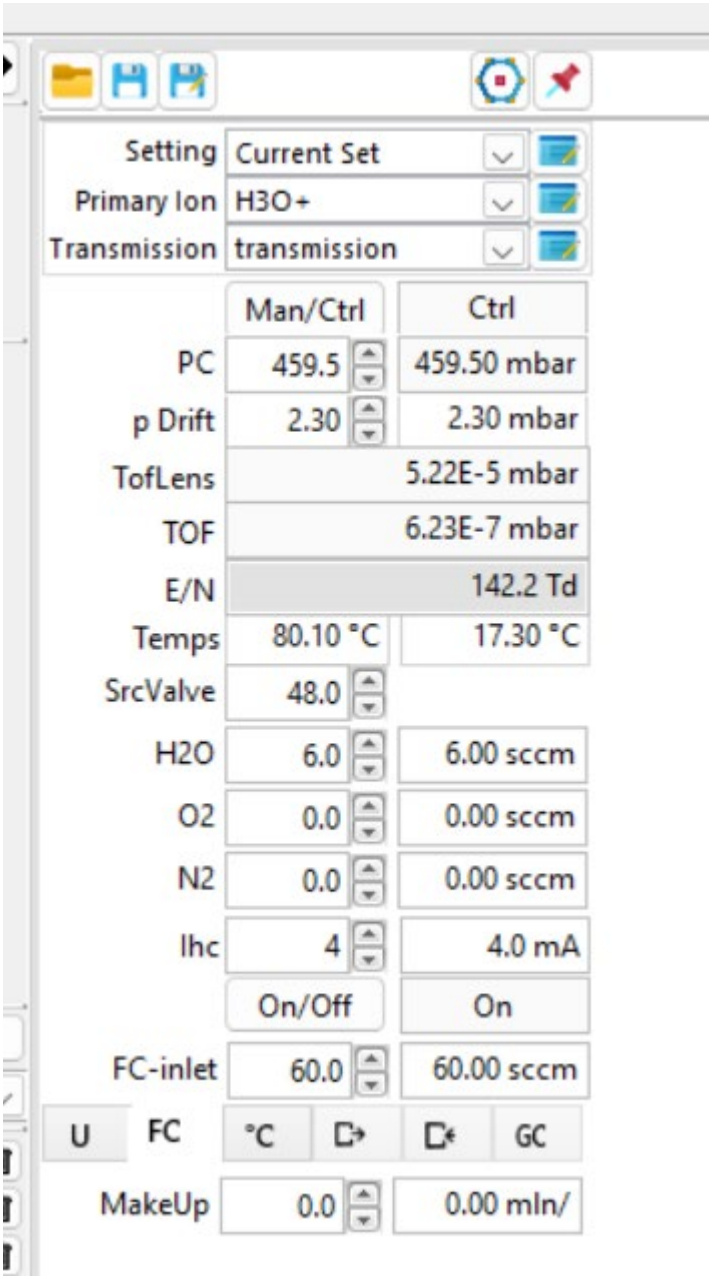
11/20/2024



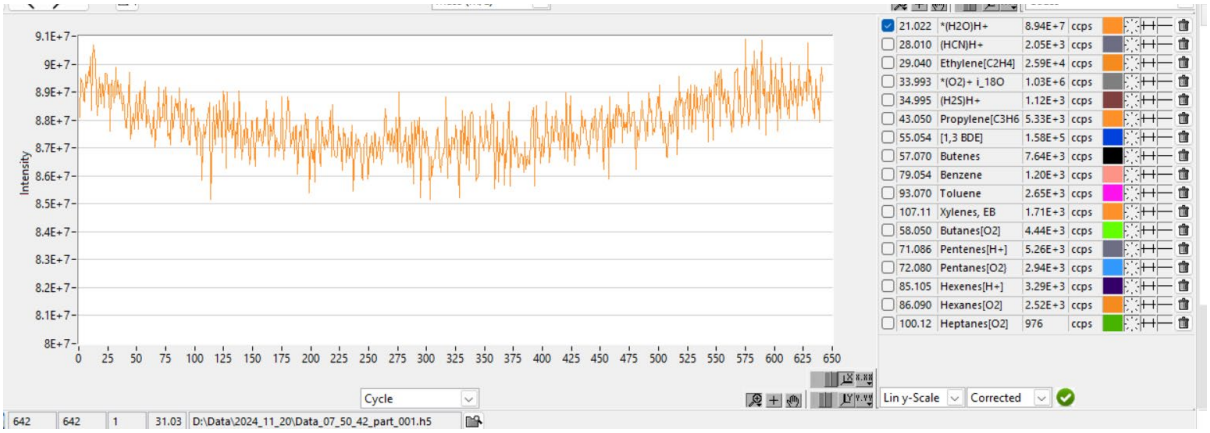
Acquisition Settings



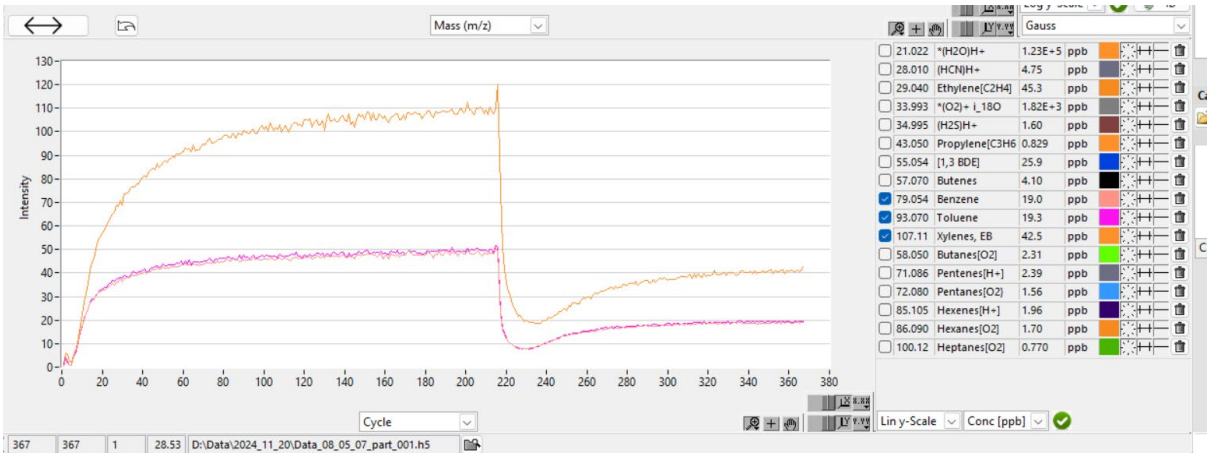
TPS Voltages and Hex settings



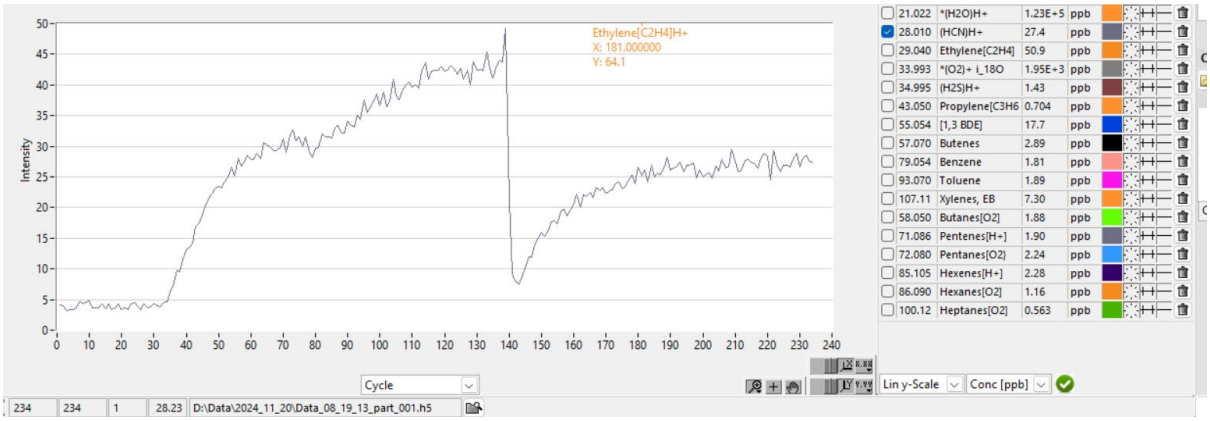
Production Settings



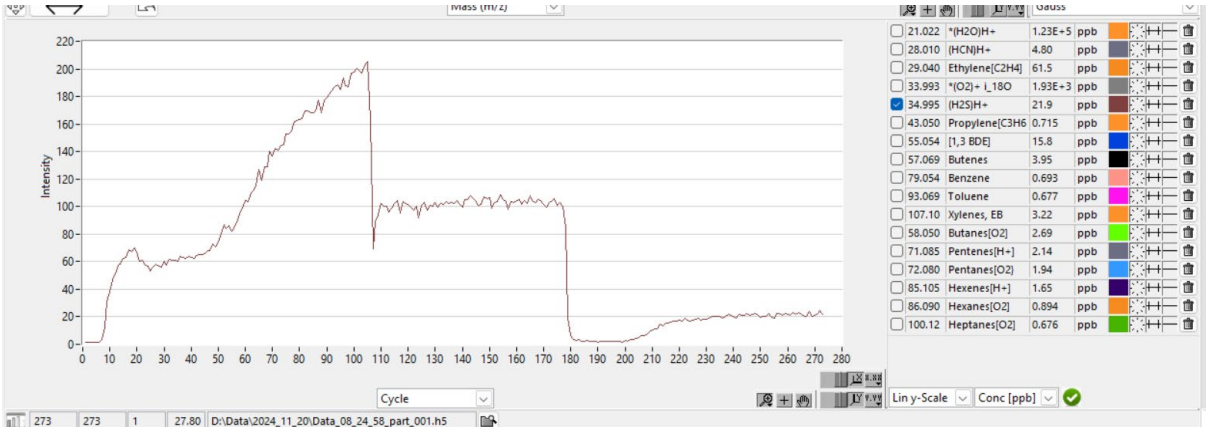
H3O+ stabilize



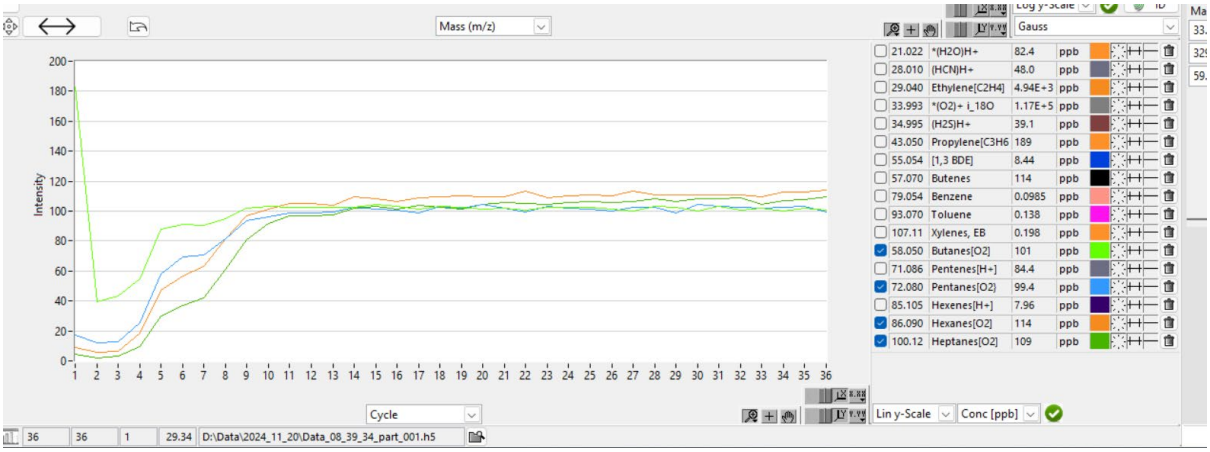
50 ppb and 20 ppb BTEX



25ppb HCN

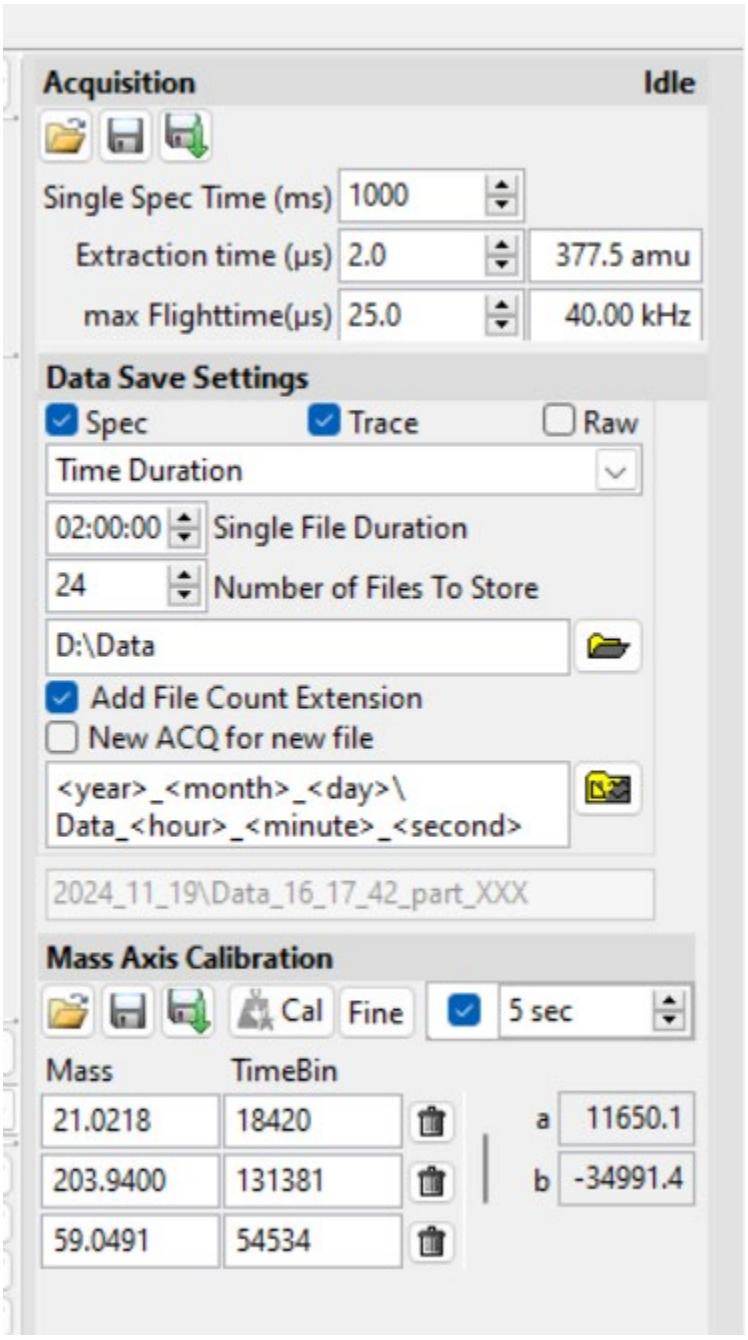


100 and 20 ppb H2S

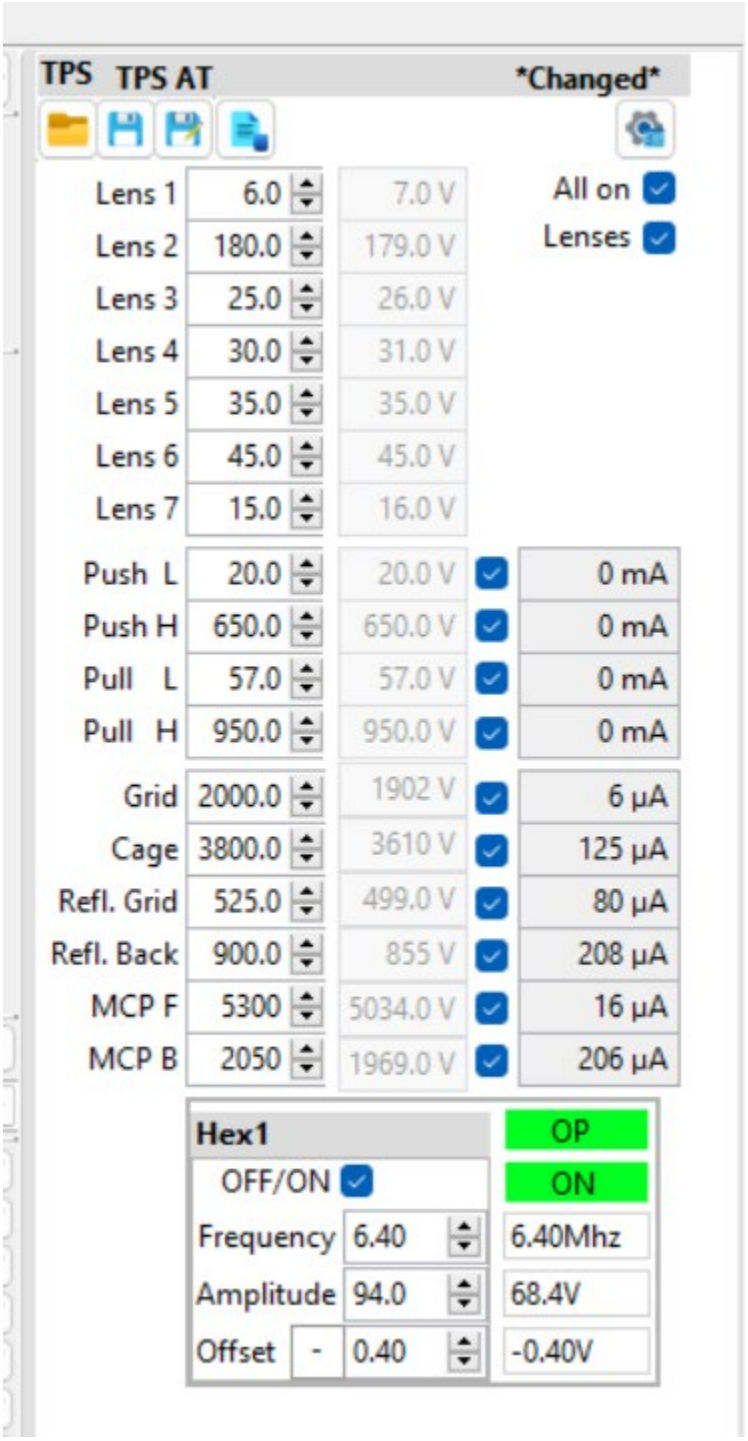


100ppb Alkanes

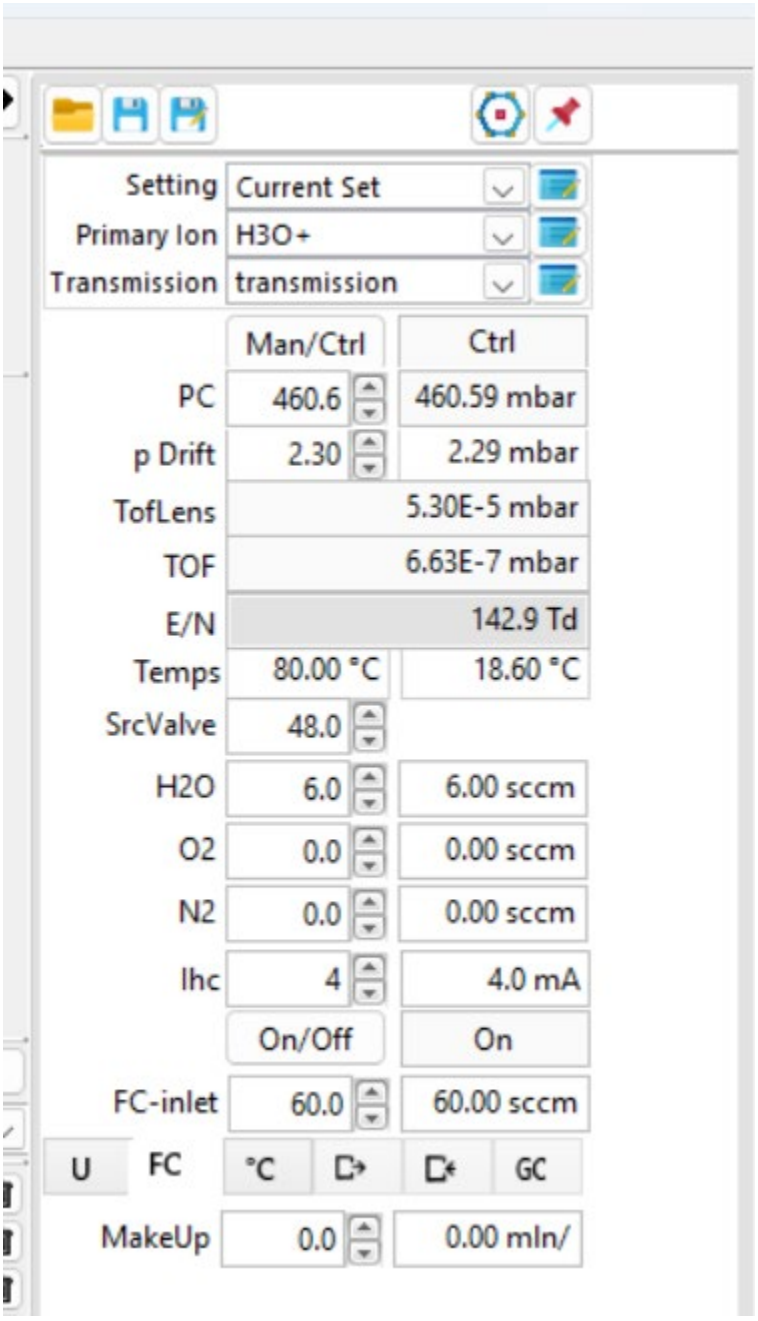
11/21/24
Swansea



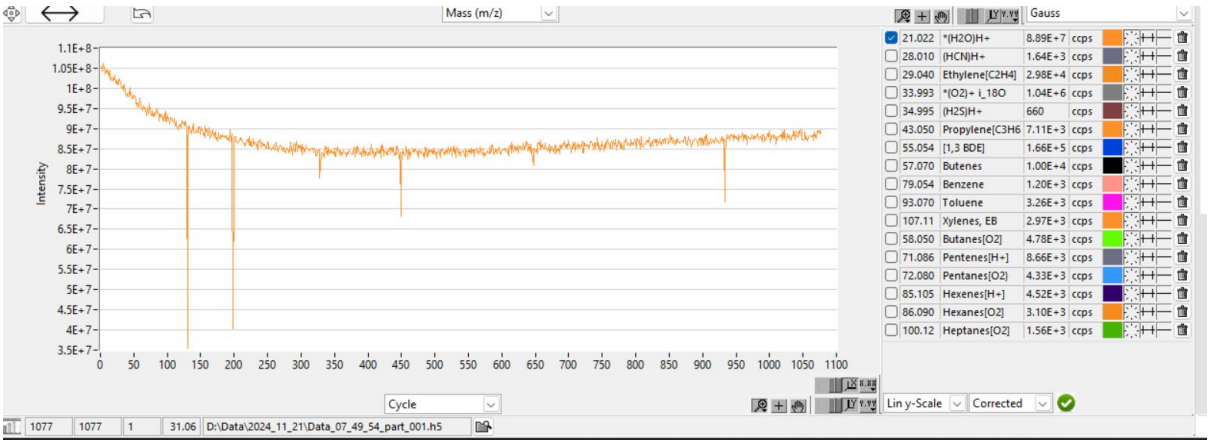
Acquisition Settings



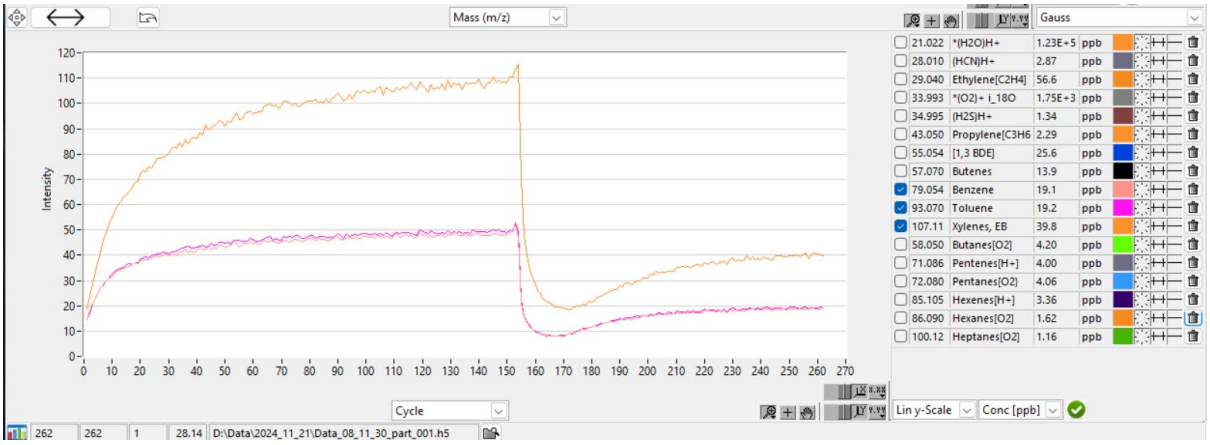
TPS Voltages and Hex Settings



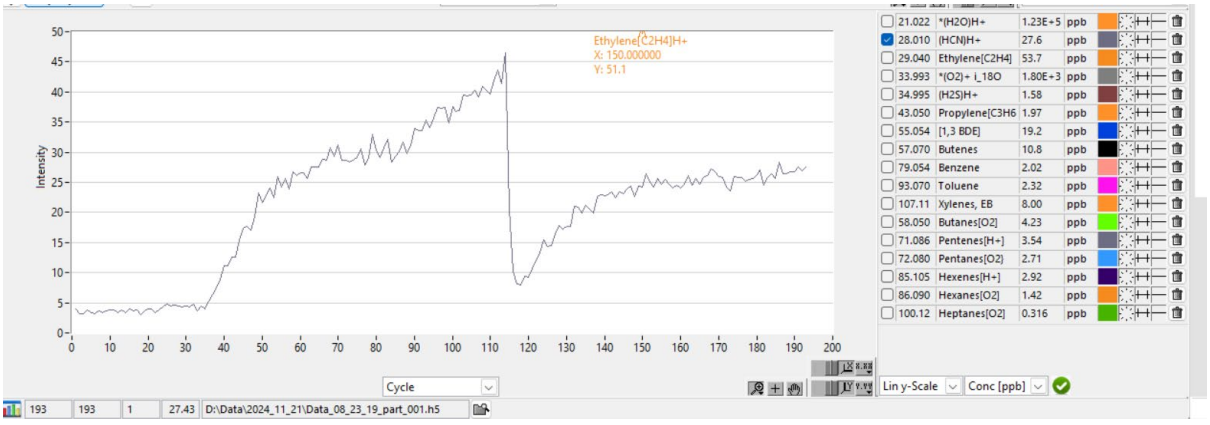
Production Settings



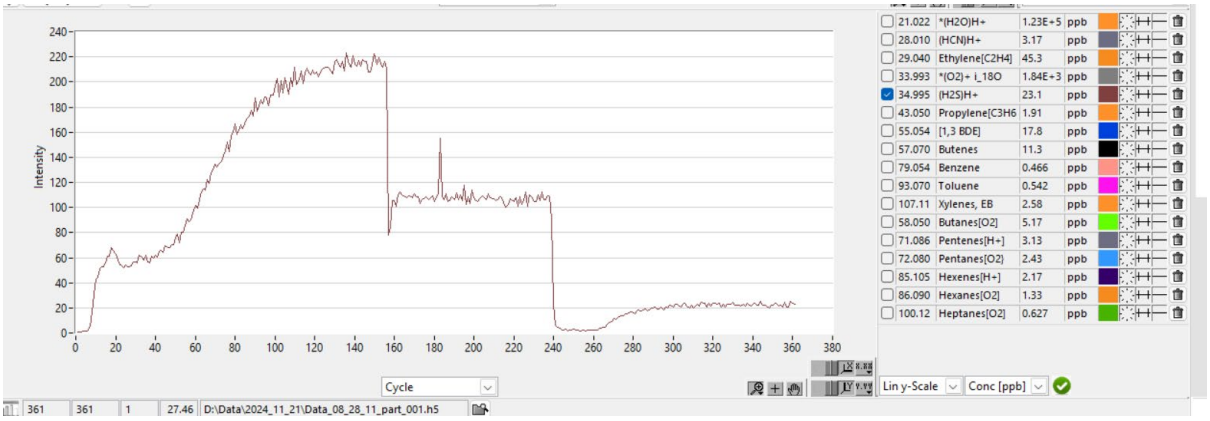
H3O+ stabilize



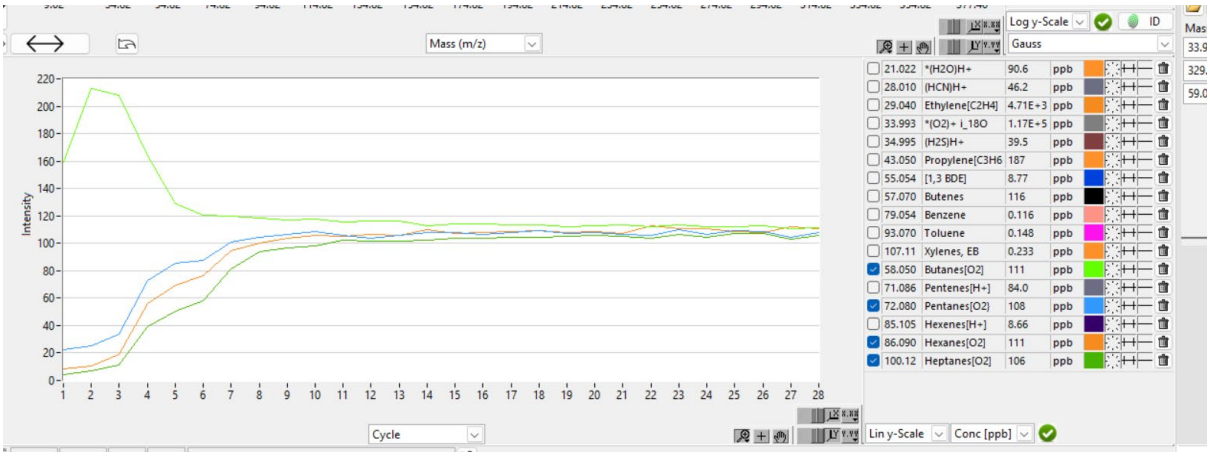
50 and 20 ppb BTEX



25 ppb HCN



100 and 20 ppb H2S



100ppb Alkanes

Initial Instrument Calibration						
Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
11/17/2204	11:51	Benzene	50	53.6	7.2	Pass
		Toluene	50	54.6	9.2	Pass
		Xylenes	100	115	15.0	Pass
		Benzene	20	20.5	2.5	Pass
		Toluene	20	21	5.0	Pass
		Xylenes	40	41.2	3.0	Pass
		Benzene	5	5.77	15.4	Pass
		Toluene	5	5.92	18.4	Pass
		Xylenes	10	11.1	11.0	Pass
	12:28	Ethylene	100	87	-13.0	Pass
		Propylene	100	106	6.0	Pass
		1-Butene	100	92.3	-7.7	Pass
		1-Pentene	100	102	2.0	Pass
		1-Hexene	100	100	0.0	Pass
		1,3-Butadiene	100	102	2.0	Pass
		Ethylene	50	53.9	7.8	Pass
		Propylene	50	51.6	3.2	Pass
		1-Butene	50	46.2	-7.6	Pass
		1-Pentene	50	49.8	-0.4	Pass
		1-Hexene	50	51.6	3.2	Pass
		1,3-Butadiene	50	56.6	13.2	Pass
		Ethylene	20	19.9	-0.5	Pass
		Propylene	20	21.5	7.5	Pass
		1-Butene	20	23.5	17.5	Pass
		1-Pentene	20	22.2	11.0	Pass
		1-Hexene	20	22.8	14.0	Pass
		1,3-Butadiene	20	21.4	7	Pass
	12:56	HCN	50	49.4	-1.2	Pass
		HCN	25	26.3	5.2	Pass
		HCN	15	17.4	16.0	Pass
	13:10	H_2S	100	97.4	-2.6	Pass
		H_2S	20	21.8	9.0	Pass
		H_2S	10	11.1	11.0	Pass
	14:49	Butane	150	143	-4.7	Pass
		Pentane	150	142	-5.3	Pass
		Hexane	150	154	2.7	Pass
		Heptane	150	152	1.3	Pass
		Butane	100	100	0.0	Pass
		Pentane	100	97.3	-2.7	Pass
		Hexane	100	106	6.0	Pass
		Heptane	100	103	3.0	Pass
		Butane	50	56.2	12.4	Pass
		Pentane	50	50	0.0	Pass
		Hexane	50	51.4	2.8	Pass
		Heptane	50	52.1	4.2	Pass

Instrument Calibration Check						
Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
11/18/2023	8:55	Ethylene	50	49.6	-0.8	Pass
Pioneer Park		Propylene	50	50.8	1.6	Pass
		1-Butene	50	44.4	-11.2	Pass
		1-Pentene	50	53	6.0	Pass
		1-Hexene	50	49.3	-1.4	Pass
		1,3-Butadiene	50	47.1	-5.8	Pass
	8:43	Benzene	50	58.6	17.2	Pass
		Toluene	50	57.3	14.6	Pass
		Xylenes	100	107	7.0	Pass
		Benzene	20	22.1	10.5	Pass
		Toluene	20	22.5	12.5	Pass
		Xylenes	40	38.3	-4.3	Pass
	8:58	HCN	25	24.7	-1.2	Pass
	9:07	H_2S	100	99.9	-0.1	Pass
	9:09	H_2S	20	20.4	2.0	Pass
	9:29	Butane	100	106	6.0	Pass
		Pentane	100	101	1.0	Pass
		Hexane	100	110	10.0	Pass
		Heptane	100	105	5.0	Pass
	14:58	HCN	25	22.2	-11.2	Pass
	15:05	H_2S	20	17.6	-12.0	Pass
	15:33	Butane	100	111	11.0	Pass
		Pentane	100	97.9	-2.1	Pass
		Hexane	100	105	5.0	Pass
		Heptane	100	102	2.0	Pass
	15:10	Benzene	20	22.4	12.0	Pass
		Toluene	20	22.8	14.0	Pass
		Xylenes	40	41.5	3.8	Pass
	15:16	Ethylene	50	56.6	13.2	Pass
		Propylene	50	53.7	7.4	Pass
		1-Butene	50	49.7	-0.6	Pass
		1-Pentene	50	53.5	7.0	Pass
		1-Hexene	50	53.4	6.8	Pass
		1,3-Butadiene	50	53.6	7.2	Pass

Instrument Calibration Check

Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
11/19/2024	8:14	Ethylene	50	54.8	9.6	Pass
Dupont		Propylene	50	52.2	4.4	Pass
Adam city		1-Butene	50	46.2	-7.6	Pass
		1-Pentene	50	51.1	2.2	Pass
		1-Hexene	50	50.3	0.6	Pass
		1,3-Butadiene	50	45.6	-8.8	Pass
	8:07	Benzene	50	54.8	9.6	Pass
		Toluene	50	55.2	10.4	Pass
		Xylenes	100	101	1.0	Pass
		Benzene	20	22.2	11.0	Pass
		Toluene	20	20.9	4.5	Pass
		Xylenes	40	39.9	-0.3	Pass
	8:19	HCN	25	27.7	10.8	Pass
	8:29	H_2S	100	104	4.0	Pass
			20	22.5	12.5	Pass
	8:51	Butane	150	148	-1.3	Pass
		Pentane	150	145	-3.3	Pass
		Hexane	150	160	6.7	Pass
		Heptane	150	156	4.0	Pass
	15:39	HCN	25	25.5	2.0	Pass
	15:43	H_2S	20	18.6	-7.0	Pass
	16:06	Butane	100	102	2.0	Pass
		Pentane	100	102	2.0	Pass
		Hexane	100	111	11.0	Pass
		Heptane	100	108	8.0	Pass
	15:50	Benzene	20	22.9	14.5	Pass
		Toluene	20	21.9	9.5	Pass
		Xylenes	40	44.3	10.8	Pass
	15:58	Ethylene	50	56	12.0	Pass
		Propylene	50	54.4	8.8	Pass
		1-Butene	50	47.9	-4.2	Pass
		1-Pentene	50	55	10.0	Pass
		1-Hexene	50	55.9	11.8	Pass
		1,3-Butadiene	50	44.3	-11.4	Pass

Instrument Calibration Check						
Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
11/20/2024	8:14	Ethylene	50	48.4	-3.2	Pass
Globeville		Propylene	50	50.7	1.4	Pass
Western Hill		1-Butene	50	47	-6.0	Pass
		1-Pentene	50	52.3	4.6	Pass
		1-Hexene	50	50.7	1.4	Pass
		1,3-Butadiene	50	45.3	-9.4	Pass
	8:05	Benzene	50	49.3	-1.4	Pass
		Toluene	50	49.1	-1.8	Pass
		Xylenes	100	109	9.0	Pass
		Benzene	20	18.8	-6.0	Pass
		Toluene	20	19.4	-3.0	Pass
		Xylenes	40	40.7	1.8	Pass
	8:19	HCN	25	26.9	7.6	Pass
	8:26	H_2S	100	102	2.0	Pass
			20	20.7	3.5	Pass
	8:39	Butane	100	103	3.0	Pass
		Pentane	100	102	2.0	Pass
		Hexane	100	110	10.0	Pass
		Heptane	100	107	7.0	Pass
	15:52	HCN	25	24.4	-2.4	Pass
	15:57	H_2S	20	17.2	-14.0	Pass
	16:20	Butane	100	104	4.0	Pass
		Pentane	100	100	0.0	Pass
		Hexane	100	104	4.0	Pass
		Heptane	100	106	6.0	Pass
	16:05	Benzene	20	19.4	-3.0	Pass
		Toluene	20	20	0.0	Pass
		Xylenes	40	41.8	4.5	Pass
	16:08	Ethylene	50	49.6	-0.8	Pass
		Propylene	50	51.8	3.6	Pass
		1-Butene	50	50.3	0.6	Pass
		1-Pentene	50	52.6	5.2	Pass
		1-Hexene	50	53	6.0	Pass
		1,3-Butadiene	50	50.9	1.8	Pass

Instrument Calibration Check						
Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
11/21/20204	8:19	Ethylene	50	51	2.0	Pass
Swansea		Propylene	50	54.1	8.2	Pass
		1-Butene	50	41.6	-16.8	Pass
		1-Pentene	50	56	12.0	Pass
		1-Hexene	50	53.3	6.6	Pass
		1,3-Butadiene	50	52.4	4.8	Pass
	8:11	Benzene	50	47.2	-5.6	Pass
		Toluene	50	49.3	-1.4	Pass
		Xylenes	100	106	6.0	Pass
		Benzene	20	18.6	-7.0	Pass
		Toluene	20	19.1	-4.5	Pass
		Xylenes	40	38.7	-3.2	Pass
	8:25	HCN	25	25.7	2.8	Pass
	8:30	H_2S	100	106	6.0	Pass
			20	22.3	11.5	Pass
	8:52	Butane	100	112	12.0	Pass
		Pentane	100	106	6.0	Pass
		Hexane	100	109	9.0	Pass
		Heptane	100	107	7.0	Pass
	12:50	HCN	25	24.6	-1.6	Pass
	12:56	H_2S	20	17.1	-14.5	Pass
	13:08	Butane	100	118	18.0	Pass
		Pentane	100	114	14.0	Pass
		Hexane	100	110	10.0	Pass
		Heptane	100	107	7.0	Pass
	12:59	Benzene	20	19.2	-4.0	Pass
		Toluene	20	19.8	-1.0	Pass
		Xylenes	40	43.2	8.0	Pass
	13:05	Ethylene	50	50.3	0.6	Pass
		Propylene	50	49.1	-1.8	Pass
		1-Butene	50	58.2	16.4	Pass
		1-Pentene	50	51.8	3.6	Pass
		1-Hexene	50	47.2	-5.6	Pass
		1,3-Butadiene	50	52.8	5.6	Pass

CCND Community Monitoring Program
PTR-TOF-MS Detection Limits
Signal to Noise Method (3X Standard Deviation)

Compound DL (ppb v)	11/18/2024 DL (ppb v)
Acetylene	0.112
Hydrogen Cyanide	0.060
Ethylene	0.164
Methanol	0.208
Hydrogen Sulfide	0.146
Propylene	0.183
1,3 Butadiene	0.029
Butenes	0.405
Butanes	0.421
Isoprene	0.080
Cyclopentane	0.107
Pentanes	0.046
Carbon Disulfide	0.033
Benzene	0.050
Hexenes	0.056
Hexanes	0.070
Toluene	0.056
Methylcyclohexanes	0.053
Heptanes	0.052
Styrene	0.070
Xylenes	0.068
Dimethylcyclohexanes	0.036
Octanes	0.025
Trimethylbenzenes	0.032
Nonanes	0.019
Diethylbenzenes	0.026
Decanes	0.023
Undecanes	0.018
Tetrachloroethylene	0.001
Dodecanes	0.001

APPENDIX E
CALIBRATION GAS CERTIFICATION SHEETS

NOTE:

Three of the calibration cylinders(Alkanes, Alkenes and Hydrogen Cyanide) used for the fourth quarter testing program were beyond the stated cylinder expiration dates. New cylinders were ordered prior to the testing program, but due to supplier delays, they were not received in time for use in the fourth quarter testing program. It should be noted that the instrument was calibrated with new standards in the first and second quarter 2025 testing program, and the calibrations used in the fourth quarter testing program were within the required calibration parameters defined in the test program (±20%).

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer:	MONTROSE AIR QUALITY SERVICES LLC		
Part Number:	X02NI99C15W0061	Reference Number:	126-402278540-1
Cylinder Number:	CC519990	Cylinder Volume:	144.3 CF
Laboratory:	124 - La Porte Mix - TX	Cylinder Pressure:	2015 PSIG
Analysis Date:	Dec 14, 2021	Valve Outlet:	330
Lot Number:	126-402278540-1		

Expiration Date: Dec 14, 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
HYDROGEN SULFIDE	1.000 PPM	1.084 PPM	+/-5%
NITROGEN	Balance		

Notes:MONTROSE AIR QUALITY SERVICES LLC
PO3: PO018078

Signature on file
Approved for Release

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Airgas
an Air Liquide company

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

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer:	MONTROSE AIR QUALITY SERVICES LLC		
Part Number:	X05NI99C15AC028	Reference Number:	160-402805384-1
Cylinder Number:	ALM-044156	Cylinder Volume:	144.0 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Aug 10, 2023	Valve Outlet:	350
Lot Number:	160-402805384-1		

Expiration Date: Aug 10, 2026

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	1.033 PPM	+/- 5%
ETHYL BENZENE	1.000 PPM	0.9830 PPM	+/- 5%
O XYLENE	1.000 PPM	1.016 PPM	+/- 5%
TOLUENE	1.000 PPM	1.021 PPM	+/- 5%
NITROGEN	99.9996 %	99.999595 %	

Notes:PO Number: PO-049252

Signature on file
Approved for Release

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	Reference Number:	126-402159020-1
Cylinder Number:	CC344804	Cylinder Volume:	144.3 CF
Laboratory:	124 - La Porte Mix - TX	Cylinder Pressure:	2015 PSIG
Analysis Date:	Jul 30, 2021	Valve Outlet:	350
Lot Number:	126-402159020-1		

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 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 - HENDERSON , CO
Part Number: X07NI99C15A00A9
Cylinder Number: EB0157463
Laboratory: 124 - La Porte Mix - TX
Analysis Date: Aug 25, 2023
Lot Number: 126-402805383-1A

Reference Number: 126-402805383-1A
Cylinder Volume: 144.0 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 350

Expiration Date: Aug 25, 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
1 BUTENE	1.000 PPM	1.104 PPM	+/- 10%
1 HEXENE	1.000 PPM	1.123 PPM	+/- 10%
1 PENTENE	1.000 PPM	1.119 PPM	+/- 10%
1,3 BUTADIENE	1.000 PPM	1.000 PPM	+/- 10%
ETHYLENE	1.000 PPM	1.172 PPM	+/- 10%
PROPYLENE	1.000 PPM	1.153 PPM	+/- 10%
NITROGEN	Balance		

Notes: MONTROSE AIR QUALITY SERVICES LLC
PO#: PO-049252

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Airgas
an Air Liquide company

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

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Part Number:	X02NI99C15A0A19	Reference Number:	SG02-IC000027612-1
Cylinder Number:	CC524330	Cylinder Volume:	142.0 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Aug 10, 2023	Valve Outlet:	350SS
Lot Number:	SG02-IC000027612-1		

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	0.9980 PPM	+/-5%
NITROGEN	Balance		

Permanent Notes:-NA-

Notes: Analysis Date 8/7/2023
Expiration Date 8/7/2024
Blend Tolerance +/-20%
Analytical Tolerance +/-5%

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