PNNL-26363

Sampling for Air Chemical Emissions from the Life Sciences Laboratory II

March 2017

MY Ballinger
MJ Lindberg

Prepared for the U.S. Department of Energy
under Contract DE-AC05-76RL01830

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BATTELLE
for the
UNITED STATES DEPARTMENT OF ENERGY
under Contract DE-AC05-76RL01830

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Pacific Northwest National Laboratory
Richland, Washington 99352

Summary

Sampling for air chemical emissions from the Life Science Laboratory II (LSL-II) ventilation stack was performed in an effort to determine potential exposure of maintenance staff to laboratory exhaust on the building roof. The concern about worker exposure was raised in December 2015 and several activities were performed to assist in estimating exposure concentrations. Data quality objectives were developed to determine the need for and scope and parameters of a sampling campaign to measure chemical emissions from research and development activities to the outside air. The activities provided data on temporal variation of air chemical concentrations and a basis for evaluating calculated emissions.

Sampling for air chemical emissions was performed in the LSL-II ventilation stack over the 6-week period from July 26 to September 1, 2016. A total of 12 sampling events were carried out using 16 sample media. Resulting analysis provided concentration data on 49 analytes. All results were below occupational exposure limits and most results were below detection limits. When compared to calculated emissions, only 5 of the 49 chemicals had measured concentrations greater than predicted.

This sampling effort will inform other study components to develop a more complete picture of a worker's potential exposure from LSL-II rooftop activities. Mixing studies were conducted to inform spatial variation in concentrations at other rooftop locations and can be used in conjunction with these results to provide temporal variations in concentrations for estimating the potential exposure to workers working in and around the LSL-II stack.

Acknowledgments

Successful performance of the tests reported herein involved a significant amount of planning and preparation, and contributions from many individuals, some of whom are acknowledged here. Mike Zabel was instrumental in coordinating the sampling and analysis efforts. He and his support staff calibrated pumps, prepared chains of custody, and provided most of the sampling equipment and media used in this effort. Ernest Antonio assisted with sampling. Adam Gemmel, Gina Wellsfry, and Jeff Renken provided facility management and engineering guidance and support. Mike Madison and Abby Nicholson supplied expertise and data on occupational exposure limits. Mikhail Alnajjar and Jeff Cathey helped supply and interpret chemical management system data. Planning and project oversight was expertly executed by Robert Ford and Eric Damberg. We thank Susan Ennor for her editorial support.

We also acknowledge the staff with offices and laboratories in the LSL-II building; they have endured numerous building outages in recent months, including weekdays during which the tests described in this report were performed.

Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
CAS	Chemical Abstracts Service
cfm	cubic foot(feet) per minute
CMS	Chemical Management System
COC	chains of custody
DL	detection limit
DQO	data quality objective
µg	microgram(s)
g	gram(s)
g/ml	gram(s) per milliliter
GC-FID	gas chromatography-flame ionization detector
HCL	hazard chemical level
HEPA	high-efficiency particulate air
HPLC/UV	high performance liquid chromatography using an ultraviolet detector
LSL	Life Sciences Laboratory
MCE	Mixed Cellulose Ester
M	Molar
mg/m^3	milligram(s) per cubic meter
ml	milliliter(s)
NIOSH	National Institute of Occupational Safety and Health
OEL	occupational exposure limit
OSHA	Occupational Health and Safety Administration
PEL	permissible exposure limit
PNNL	Pacific Northwest National Laboratory
ppm	parts per million
REL	recommended exposure limit
STEL	short-term exposure limit
TDB	technical data bulletin
TLV	threshold limit value
TWA	time-weighted average
VOC	volatile organic compound
WEEL	workplace environmental exposure level

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1.0 Introduction

In December 2015, maintenance workers on the Life Science Laboratory II (LSL-II) building roof reported that they may have been exposed to laboratory exhaust while working near an operating exhaust point. This event represented a concern to management because the pathway for potential exposure had not been identified during work planning. The exhaust point included ventilation from laboratories within the building, and the concern was that workers on the roof could have been exposed to air chemical concentrations above the limits recommended for worker safety and health. Management determined that actions were needed to better characterize the emissions at the exposure location and to evaluate whether measures should be taken to protect worker safety and health. Characterization actions included conducting mixing studies to characterize the dispersion of contaminants from the source (e.g., laboratory fume hoods) to the exhaust point and sampling and analysis of air chemical concentrations in the exhaust. This report describes the sampling and analysis activities and presents results.

The exposure concern was raised, in part, because the LSL-II exhaust does not terminate with a ductwork stack, which typical exhaust systems employ. Instead, the fans exhaust into a corridor constructed of cinder blocks with 9-foot walls and no ceiling. Three partitions divide this stack/corridor, none of which meet the roof deck. Hatches in each of the partitions allow passage between the stack/corridor sections. The corridor is accessed via full size doors located on each end of the corridor. Figure 1 is a plan view of a portion of the LSL-II rooftop showing the fan exhaust configuration. As a result of this stack design, workers must pass through portions of the corridor, which is effectively the exhaust stack, to perform regular maintenance activities.

Data quality objectives (DQOs) were developed for sampling from the LSL-II stack exhaust. These DQOs included identification of the contaminants of most concern based on an analysis of the chemical inventory and a walk-down of current research activities. All samples were taken from directly in front of the operational stack fan because it was identified as the location of highest concentration by mixing studies (Flaherty and Antonio 2016). Mixing study results provided information about spatial variability at different locations on the roof. Stack sampling for air chemical concentrations provided temporal variability data.

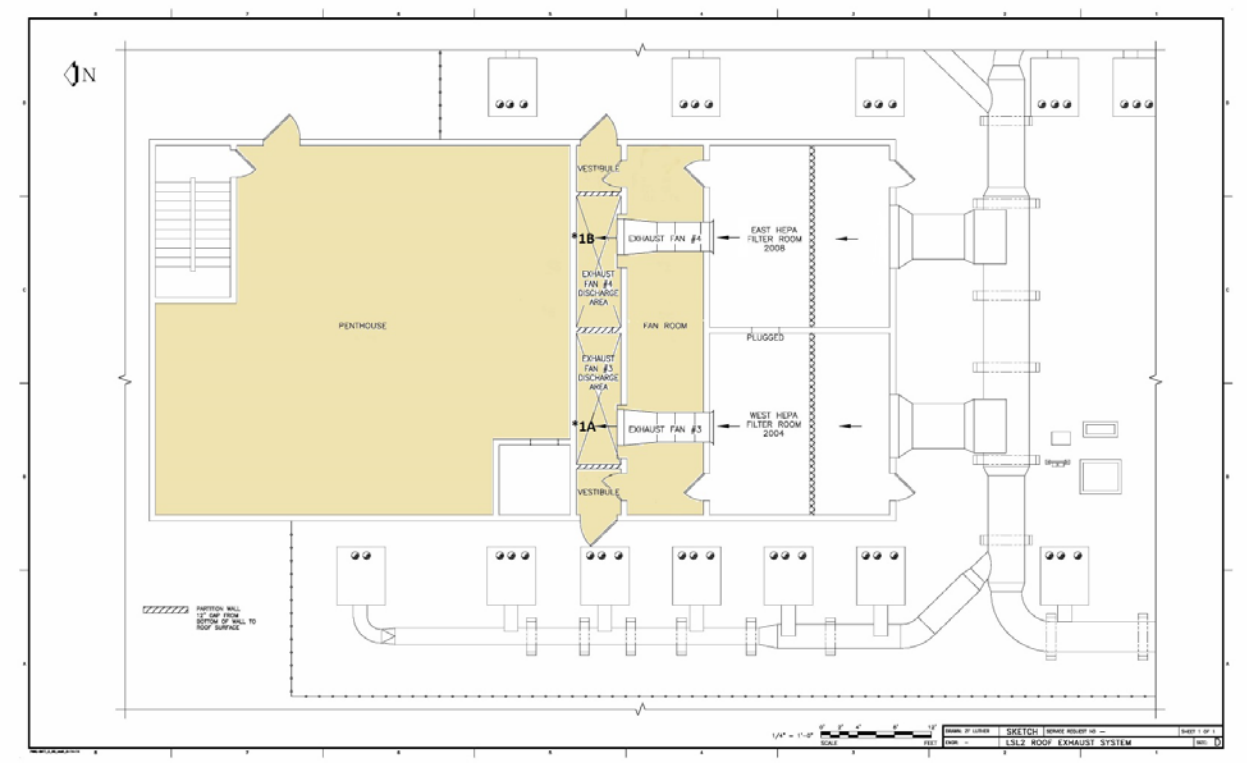

Figure 1. Plan View of a Portion of the LSL-II Rooftop

2.0 Methods

To support the determination of potential concentrations of chemicals to which workers may have been exposed on the LSL-II roof, stack exhaust samples were taken over a 6-week period and analyzed for a number of potential contaminants. This section describes the testing methods employed in this study.

2.1 LSL-II Exhaust Configuration

LSL-II has two laboratory exhausts, one that services most of the areas on the main floor and exhausts to the roof, and a second "critical" exhaust that services labs in the basement and some of the main floor lab areas. Currently, and for at least the past few years, no research work has been conducted in the critical exhaust areas. The LSL-II roof exhaust system sampled during this campaign ventilates the first floor laboratories (including fume hoods, snorkels, and rooms) and offices. As shown in Figure 1, four branches of duct work (two to the west, two to the east) combine to a common duct south of the high-efficiency particulate air (HEPA) filter rooms. Two fans are downstream of the HEPA rooms. Each fan is rated to 55,000 cfm. The most common operating condition is to have one fan operational while one is in standby, but historically, there have been occasions when both fans have operated simultaneously. In either configuration, the variable frequency drives adjust the fan speed such that the total flow rate through the system is constant at around 48,000 cfm. This control is determined by a pressure set point in the common duct south of the HEPA rooms. At the time of this sampling, only exhaust fan 4 was operating and all samples were taken at the fan face. HEPA filters were removed in August, 2015, so the exhaust stream had no HEPA filtration at the time of sampling or at the time of the exposure concern.

2.2 Selection of Parameters

As a research facility, LSL-II contains a large number of chemicals, most of which are present and used in small quantities. Chemical types and quantities are tracked using a database developed for chemical inventory tracking. Data from the Pacific Northwest National Laboratory (PNNL) Chemical Management System (CMS) provided an inventory of thousands of chemicals in LSL-II, which included the current inventory at the time of the download plus a metric that provides an indication of turnover. Inventory data were used to conservatively estimate stack emission concentrations, which were then divided by chemical-specific occupational exposure limits (OELs) to obtain a risk ratio. The following steps were used to identify chemicals in the LSL-II exhaust system that may have posed a risk to worker health and safety in the recent past and currently and to evaluate and rank these chemicals to establish sampling criteria:

1. LSL-II Inventory data from the CMS were obtained using the hazard chemical level 3 (HCL-3)[1] report. About 1500 different chemicals are listed in the inventory and about 550 are considered HCL-3. Over 300 of these have Chemical Abstracts Service (CAS) numbers and were used in this analysis. Chemical names can vary, so CAS numbers are a better identifier and way to match chemicals with occupational exposure criteria.

2. Usage Inventory for LSL-II was obtained for 2015. Usage reports are available by chemical meta-groups, which contain different subsets of chemicals. Usage reports were obtained for the following meta-groups: Air Compliance Impact Groups, chemical carcinogens, chemicals with reportable quantities, corrosives, Facility Use Agreement tracked chemical groups, volatile organic compounds (VOCs), and Washington Toxic Air Pollutants. Each report gives the chemical name, CAS number, usage quantity, and inventory quantity. Usage quantities are calculated by assuming that the contents of each container are used uniformly between the time a container is full when it is initially added to the inventory and the time it is removed from the inventory. Usage units are in kilograms per month (kg/month).

   The usage column consists of the usage quantity plus half of the current inventory, which is distributed evenly over the months chosen for the report. Thus, the usage column is used as a conservative estimate of the quantity per month used in the lab.

   The usage reports contained usage data for most of the 300 HCL-3 chemicals from the CMS. Approximately 39 chemicals did not have usage data so they were not represented by the chemical meta-groups. Only 4 of the 39 had OELs and these 4 were included by obtaining individual usage reports. Usage reports provided data for an additional ~400 chemicals that were not represented in the CMS HCL-3 group. These chemicals are either not considered HCL-3 or they were used during 2015 but are no longer in the inventory. They were included in the evaluation.

3. OELs were obtained with compiled data from several agencies (American Conference of Governmental Industrial Hygienists [ACGIH], Occupational Safety and Health Association [OSHA], National Institute of Occupational Safety and Health [NIOSH]), levels (time-weighted average [TWA], short-term exposure limit [STEL], ceiling), and units (ppm, mg/m^3, %). For chemicals with multiple criteria, the priority was as follows: USA OSHA permissible exposure limit (PEL) TWA, NIOSH recommended exposure limit (REL) TWA, ACGIH threshold limit value (TLV) TWA,

[1] Chemicals and groups of chemicals are assessed according to their chemical properties and health and physical hazards (toxicity, flammability, corrosivity, pyrophoricity, explosivity, etc.). Based on the results of the assessment, chemicals are placed into one of three hazard chemical levels (HCLs) (HCL-1, HCL-2, or HCL-3); HCL-3 represents the highest hazard.

American Industrial Hygiene Association (AIHA) workplace environmental exposure level (WEEL) TWA. If no TWA criteria were available, STELs or ceiling values were used and the chemicals were listed separately. Criteria are available for ~850 chemicals and TWA criteria are available for over 90%.

4. The CMS inventory includes a column for concentration that can be used for containers of liquids that have dilute concentrations of a chemical. Various units can be used (e.g., %, g/ml, mg/ml, M, proof, etc.). Conversions can be used to calculate inventory quantities of the pure chemicals. These conversions were used for chemicals that have OEL criteria.
5. Concentrations in the stack were calculated using the same assumptions as for air chemical calculations: a quantity of usage plus half of the inventory assumed to be used in a 20-day period and a release fraction of 1 for gases, 0.1 for liquid volatiles/semi-volatiles, and 1E-3 for everything else is applied. The regulatory basis for the release fractions is Title 40 of the *Code of Federal Regulations* Part 61, Appendix D (EPA 1989). Usage reports do not have physical form information, so chemical inventory data were used when available. Chemicals were identified as volatiles using the VOC usage report and as identified on the template used for air chemical emissions. All chemicals were assumed to be exhausted through the main stack with an exhaust flow of 21,050 cfm, which is conservative compared to the expected system flow of 48,000 cfm.
6. Stack concentrations were divided by OEL concentrations to get a unit-less ratio that was used to rank chemicals from highest to lowest potential toxicity. OELs were ranked separately depending on the type of OEL—TWA vs. STEL vs. ceiling. Almost 250 chemicals had inventory and/or usage data and OEL criteria to enable calculation of a ratio.
7. The ranked grouping was used to evaluate the top chemicals/chemical groups for sampling and analysis.

A more in-depth analysis followed the first ranking method. It included a building walk-down and review of the chemicals and mixtures identified in the CMS to determine whether their actual use and quantity for research in the building merited sampling and analysis.

Based on the evaluation of the chemical usage in LSL-II it was decided that chemicals with estimated concentrations greater than 0.1% of their OEL would be selected for sampling and analysis. Several types of sampling were performed for the chemicals of concern. The sampling included passive type sampling for most organic chemicals and direct sampling for inorganic constituents and a few organic chemicals (see Table 1 and Table 2).

The sampling occurred during a normal work day, when chemicals were being actively used, at a selected location on the rooftop. Air chemical concentrations are expected to be greater from 8 AM to 4 PM on weekdays because research is primarily conducted during the normal work day. This also corresponds to the usual times of roof maintenance. Because of the physical location and the restrictive access to the LSL-II rooftop, the sampling period was approximately 6:00 AM to 6:00 PM, which was as close to an 8-hour time period as possible, given that building outages were required for setup and take-down. Mixing study data (Flaherty and Antonio 2016) provided data on the spatial variation of the exhaust concentrations on the roof. As expected, the highest concentrations were at the face of the operating fan. Sampling was performed at the operating fan face for this study to maximize the potential for measuring emissions above detection limits.

Samples were taken on Tuesdays and Thursdays in a 6-week time period from July 24 to September 1, 2016 (see Table 3). The summer time period and the selection of mid-week days to sample were selected based on maximizing the potential for research activities. Field blanks were also collected each week for quality assurance. The blanks were collected by taking an extra set of sample media to the LSL II loading

dock on Thursdays, opening the cartridge cans and depositing the media into sample bags while setting up the normal sample media on the tripod. The number of samples collected in the sample campaign was based on the minimum number from previous sampling campaigns conducted by PNNL to measure air chemical emissions in facility exhausts (Ballinger et al. 2013, 2014).

Table 1. Active Sampling

Name	CAS#	Form	OEL (mg/M^3)	Ratio Conc/OEL	Media
Gas					
ammonia anhydrous	7664-41-7	Gas	34.8	63.3%	SKC Passive Sampler(UME300), Chemdisk #584
hydrogen sulfide	7783-06-4	Gas	13.9	5.0%	SKC Gastec Dosi-tube, Radiello 170
ethylene oxide	75-21-8	Gas	1.8	2.0%	SKC Passive Sampler (part # 575-005), 3M Monitor 3550/3551
sulfur dioxide	7446-09-5	Gas	5.2	0.7%	SKC Passive Sampler: UMEx 200, Radiello 166
nitrous oxide	10024-97-2	Gas	45.0	0.5%	SKC Passive Sampler: UMEx 200, Chemdisk #584
Volatile Organic Analysis (VOA)/Semi-VOA					
1,1,1-trichloroethane	71-55-6	Liquid	1909.9	0.005%	3M TDB 1028 (3M 3520 passive badge)
1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	Liquid	7664.6	0.001%	3M TDB 1028 (3M 3520 passive badge)
1,1-dichloroethane	75-34-3	Liquid	404.7	0.007%	3M TDB 1028 (3M 3520 passive badge)
1,2,4-trichlorobenzene	120-82-1	Liquid	148.1	0.0009%	3M TDB 1028 (3M 3520 passive badge)
1,2,4-trimethylbenzene	95-63-6	Liquid	122.9	0.001%	3M TDB 1028 (3M 3520 passive badge)
1,2-dichlorobenzene	95-50-1	Liquid	150.3	0.0004%	3M TDB 1028 (3M 3520 passive badge)
1,2-dichloroethane	107-06-2	Liquid	202.4	0.00004%	3M TDB 1028 (3M 3520 passive badge)
1,4-dichlorobenzene	106-46-7	Liquid	450.9	0.00002%	3M TDB 1028 (3M 3520 passive badge)
acetone	67-64-1	Liquid	2375.5	0.03%	3M TDB 1028 (3M 3520 passive badge)
acetonitrile	75-05-8	Liquid	67.2	6.2%	3M TDB 1028 (3M 3520 passive badge)
acid treated heavy naphthenic distillate	64742-18-3	Liquid	1.7	2.9%	3M TDB 1028 (3M 3520 passive badge)
acrylonitrile	107-13-1	Liquid	4.3	0.8%	3M TDB 1028 (3M 3520 passive badge)
benzene	71-43-2	Liquid	3.2	17.8%	3M TDB 1028 (3M 3520 passive badge)
carbon tetrachloride	56-23-5	Liquid	62.9	0.06%	3M TDB 1028 (3M 3520 passive badge)
chlorobenzene	108-90-7	Liquid	345.3	0.006%	3M TDB 1028 (3M 3520 passive badge)
chloroform	67-66-3	Liquid	48.8	0.5%	3M TDB 1028 (3M 3520 passive badge)
cumene	98-82-8	Liquid	245.8	0.00001%	3M TDB 1028 (3M 3520 passive badge)
dichlorodifluoromethane	75-71-8	Gas	4945.6	0.0001%	3M TDB 1028 (3M 3520 passive badge)
epichlorohydrin (1-chloro-2,3-epoxypropane)	106-89-8	Liquid	1.9	0.2%	3M TDB 1028 (3M 3520 passive badge)
ethyl alcohol	64-17-5	Liquid	1884.3	0.03%	3M TDB 1028 (3M 3520 passive badge)
ethylbenzene	100-41-4	Liquid	434.2	0.02%	3M TDB 1028 (3M 3520 passive badge)
isopar m	64742-47-8	Liquid	5.0	0.2%	3M TDB 1028 (3M 3520 passive badge)

Table 1. (contd)

Name	CAS#	Form	OEL (mg/M^3)	Ratio Conc/OEL	Media
methyl alcohol	67-56-1	Liquid	262.1	1.5%	3M TDB 1028 (3M 3520 passive badge)
methyl ethyl ketone	78-93-3	Liquid	589.8	0.03%	3M TDB 1028 (3M 3520 passive badge)
methylene chloride	75-09-2	Liquid	86.8	1.8%	3M TDB 1028 (3M 3520 passive badge)
n,n-dimethylacetamide	127-19-5	Liquid	35.6	0.1%	3M TDB 1028 (3M 3520 passive badge)
n,n-dimethylformamide	68-12-2	Liquid	29.9	25.7%	3M TDB 1028 (3M 3520 passive badge)
o-xylene	95-47-6	Liquid	434.2	0.001%	3M TDB 1028 (3M 3520 passive badge)
paraffin oil	8012-95-1	Liquid	5.0	2.2%	3M TDB 1028 (3M 3520 passive badge)
pentane	109-66-0	Liquid	2950.9	0.001%	3M TDB 1028 (3M 3520 passive badge)
p-xylene	106-42-3	Liquid	434.2	0.0001%	3M TDB 1028 (3M 3520 passive badge)
styrene	100-42-5	Liquid	425.9	0.0003%	3M TDB 1028 (3M 3520 passive badge)
tetrachloroethylene	127-18-4	Liquid	678.1	0.005%	3M TDB 1028 (3M 3520 passive badge)
tetrahydrofuran	109-99-9	Liquid	589.78	0.04%	3M TDB 1028 (3M 3520 passive badge)
toluene	108-88-3	Liquid	753.6	0.05%	3M TDB 1028 (3M 3520 passive badge)
trichloroethylene	79-01-6	Liquid	537.4	0.08%	3M TDB 1028 (3M 3520 passive badge)
Miscellaneous					
formaldehyde	50-00-0	Liquid	0.9	0.2%	3M TM Formaldehyde Monitor 3720/3721
hydrazine, monohydrate	7803-57-8	Liquid	0.01	21.2%	SKC Gastec Dosi-tube (810-3D) qualitative

Table 2. Passive Sampling

Name	CAS#	Form	OEL (mg/M^3)	Ratio Conc/OEL	Media
Inorganic and Organic Acids					
hydrogen chloride	7647-01-0	Gas	29.8	0.3%	NIOSH 7903 (IC) Silica gel tube (400/200mg)
phosphoric acid	7664-38-2	Liquid	1.0	0.2%	NIOSH 7903 (IC) Silica gel tube (400/200mg)
nitric acid	7697-37-2	Liquid	5.2	0.2%	NIOSH 7903 (IC) Silica gel tube (400/200mg)
chlorosulfonic acid	7790-94-5	Liquid	0.1	0.1%	NIOSH 7903 (IC) Silica gel tube (400/200mg)
formic acid	64-18-6	Liquid	9.4	0.1%	NIOSH 7903 (IC) Silica gel tube (400/200mg)
acetic acid	64-19-7	Liquid	24.6	0.1%	NIOSH 7903 (IC) Silica gel tube (400/200mg)
Solids					
silicon dioxide	14808-60-7	Solid	0.1	21.3%	37 mm MCE filters/ Gravametric and 7300 Analysis
copper, dust as cu	7440-50-8	Solid	0.1	0.9%	37 mm MCE filters/ Gravametric and 7300 Analysis
silica, crystalline - cristobalite	14464-46-1	Solid	0.1	0.6%	37 mm MCE filters/ Gravametric and 7300 Analysis
lead	7439-92-1	Solid	0.1	0.2%	37 mm MCE filters/ Gravametric and 7300 Analysis
potassium hydroxide	1310-58-3	Solid	2.0	0.8%	37 mm MCE filters/ Gravametric and 7300 Analysis
sodium metabisulfite	7681-57-4	Solid	5.0	0.1%	37 mm MCE filters/ Gravametric and 7300 Analysis
Miscellaneous					
methylene bis(4-cyclohexylisocyanate)	5124-30-1	Liquid	0.1	0.9%	OSHA PV2092 (HPLC/UV) Coated glass fiber filter in cassette
cyclohexylamine	108-91-8	Liquid	40.6	0.3%	OSHA PV2016 (GC-FID) Coated XAD-7 tube
epichlorohydrin (1-chloro-2,3-epoxypropane)	106-89-8	Liquid	1.9	0.2%	NIOSH 1010 (GC-FID) Charcoal tube (100/50mg)
2-diethylaminoethanol	100-37-8	Liquid	47.9	3.6%	NIOSH 2007 (GC-FID) Silica gel tube (300/150mg)

Table 3. Sampling Dates

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7/24	7/25	7/26	7/27	7/28	7/29	7/30
7/31	8/1	8/2	8/3	8/4	8/5	8/6
8/7	8/8	8/9	8/10	8/11	8/12	8/13
8/14	8/15	8/16	8/17	8/18	8/19	8/20
8/21	8/22	8/23	8/24	8/25	8/26	8/27
8/28	8/29	8/30	8/31	9/1	9/2	9/3

2.3 Sampling and Analysis Methods

Sampling preparation included collection of badges, calibration of pumps for active sampling, and preparation of chains of custody (COCs) used to record pertinent sample data (e.g., location, date, time, sample duration). Each event required setting up nine badges for passive sampling and six pumps with attached tubes and filters for active sampling. Badges for passive and active sampling were attached to a structure made of a tripod, polyvinyl chloride pipe, and clamps (see Figure 2) and faced toward the exhaust stream. Tabs were removed and pumps were turned on as required to begin sampling.

All sampling media were placed in the fan exhaust area. After the staging of the pumps and badges, research activities in the laboratories, exhaust fume hoods, and snorkels continued as normal. There were no known maintenance activities potentially affecting the exhaust plenum at this time. The only sources of contaminants in the exhaust system were related to laboratory activities.

At the end of day, sample pumps were turned off, and the media were removed from the apparatus and managed/stored as appropriate. Pumps were post-calibrated and COCs were completed. As mentioned previously, field blanks were also prepared on a weekly basis and submitted for analysis with the samples collected that week. Analysis was performed by Bureau Veritas, located in Novi, Michigan. Bureau Veritas maintains AIHA accreditation.

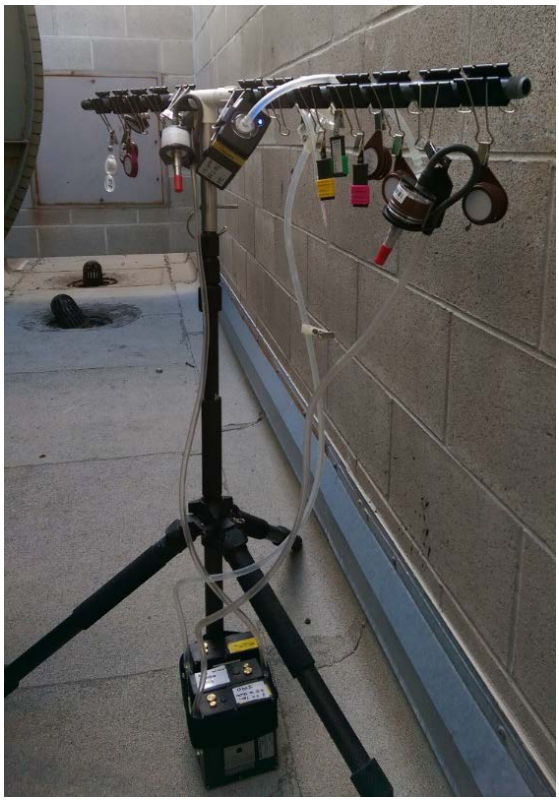

Figure 2. Sampling Apparatus

3.0 Test Results

The primary reportable results from the LSL-II exhaust sampling study include the concentrations of air chemical emissions at the fan discharge location. This section describes the sampling results and compares the results to calculated emissions.

3.1 Sampling Results

Air emissions from the face of the operating fan on the LSL-II roof were obtained twice a week for a 6-week time period from July 26 to September 1 (see Table 3). Sixteen media were used in the sampling campaign and submitted for analysis along with weekly trip blanks. Table 4 is a summary of the samples submitted. Samples with a "B" in the ID indicate field blanks. Sample loss is also identified in the table and was due to breakage (glass media used for mineral acids), malfunction (pumps), lab error, or missing data. Lost and missing data were about 5% of the total results.

A summary of the analytical results is presented in Table 5; the full data set is in Appendix A. Maximum concentrations of each analyte are shown in milligrams per cubic meter (mg/m^3). OEL concentrations are displayed in comparison to measured concentrations and the ratio of the concentration to the OEL is also presented. The total number of analyses for each analyte is shown along with the number of results above the detection limit. For all analytes, the detection limit was less than the corresponding OEL, indicating that the sampling campaign provided measurements of sufficient resolution to compare with the OELs. The analyte with the highest detection limit compared to the OEL was epichlorohydrin at 13%. All

epichlorohydrin results were below the detection limit, so the maximum concentration was less than 13% of the OEL. For most of the analytes (40 out of 49), all results were below detection limits.

Measured concentrations above detection limits were below the OELs. The analyte with the highest concentration compared to the OEL was acetonitrile at 16%. Table 6 shows the analytes with detectable results, the detection frequency for these analytes, and the maximum ratio of the measured concentration to the OEL. Notes on quality implications are included. For acetonitrile, detectable concentrations were also obtained from the field blank, indicating possible issues with contamination. For some of the other analytes, the detectable results were very close to the detection limit, indicating a greater uncertainty in the reportable value.

All results with concentrations above the detection limit are listed in Table 7. This includes all the results for acetonitrile and formaldehyde and a few of the results for carbon tetrachloride, dichlorodifluoro-methane, and hydrochloric acid. Three out of six acetonitrile field blank results also had results above detection limits. The results for field blanks are given in units of mass because there is no volume of sample air that can be used to calculate concentration. Results from the three field blanks that were above the detection limit were 100 – 160 µg. This compares to 400 µg on the sample with the maximum concentration of 11 mg/M^3 which is 16% of the OEL.

Table 4. Samples and Results Obtained

Date→	7/26	7/28	7/28	8/2	8/4	8/4	8/9	8/11	8/11	8/16	8/18	8/18	8/23	8/25	8/25	8/30	9/1	9/1
Sample ID→	1	2	3B	4	5	6B	7	8	9B	10	11	12B	13	14	15B	16	17	18B
ACE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	NS	1	1
ACID	NS	3	3	3	3	3	3	3	3	3	3	3	SM	SM	SM	SM	SM	SM
ACR	1	1	1	1	1	1	1	1	1	1	1	1	1	NS	1	1	1	1
DMAA	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
EO	1	1	1	1	1	1	1	1	1	1	1	1	1	NS	1	1	1	1
EPI	1	1	1	1	1	1	1	1	1	1	1	1	SM	SM	SM	1	1	1
FMH	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ISO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	NS	1
MET	1	1	1	1	1	1	1	NS	NS	1	1	1	1	1	1	1	1	1
MTL	4	4	4	4	4	4	4	4	4	NS	4	4	4	4	4	4	4	4
NH3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ORG	25	25	25	24[a]	24[a]	24[a]	25	25	25	25	25	25	25	25	25	25	25	25
RP	1	1	NS	1	1	NS	1	1	1	1	1	NS	1	1	1	1	1	1
SI	3[b]	3[b]	3[b]	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
SO	1	1	1	1	1	1	1	1	1	1	1	1	1	NS	1	1	1	1
TCTF	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

NS = No sample submitted.

SM = Sample Results Missing.

(a) Acetone results lost due to lab error.

(b) Results for tridymite given in addition to quartz and crystobalite.

Table 5. Summary of Analytical Results

Group	Analyte	Conc. (mg/M^3)[a]	OEL (mg/M^3)	% of OEL	# of Samples	Results >DL
ACE	Acetonitrile[b]	11	67.16	16%	11	9
ACID	Hydrochloric acid	0.087	29.77	0.29%	7	3
	Nitric acid	0.52	5.16	10%	7	3
	Phosphoric acid	<0.025	1	2.5%	7	0
ACR	Acrylonitrile	<0.13	4.34	3.0%	11	0
DMAA	Dimethylacetamide	<0.19	35.63	0.53%	12	0
	Dimethylformamide	<0.43	29.89	1.4%	12	0
EO	Ethylene oxide	<0.14	1.8	7.8%	11	0
EPI	Epichlorohydrin	<0.25	1.89	13%	10	0
FMH	Formaldehyde	0.019	0.92	2.1%	12	12
ISO	Methylene -bis(4-cyclohexylisocyanate)[c]	<0.0012	0.05	2.4%	11	0
MET	Methanol	<0.91	262.09	0.35%	11	0
MTL	Copper	<0.00073	0.1	0.73%	11	0
	Lead	<0.00073	0.05	1.5%	11	0
	Potassium[d]	<0.0073	2	0.37%	11	0
	Sodium[e]	<0.0073	5	0.15%	11	0
NH3	Ammonia	<0.37	34.83	1.1%	12	0
ORG	1,1,1-trichloroethane	<0.24	1909.9	0.013%	12	0
	1,1-dichloroethane	<0.22	404.74	0.054%	12	0
	1,2,4-trichlorobenzene	<0.36	148.13	0.24%	12	0
	1,2,4-Trimethylbenzene	<0.17	122.89	0.14%	12	0
	1,2-dichlorobenzene	<0.32	150.32	0.21%	12	0
	1,2-Dichloroethane	<0.22	202.39	0.11%	12	0
	1,4-dichlorobenzene	<0.32	150.32	0.21%	12	0
	Acetone	<0.15	2375.46	0.0063%	10	0
	Benzene	<0.041	3.19	1.3%	12	0
	Carbon tetrachloride	0.81	62.91	1.3%	12	2
	Chlorobenzene	<0.25	345.28	0.072%	12	0
	Chloroform	<0.26	48.83	0.53%	12	0
	Cumene	<0.18	245.79	0.073%	12	0
	Ethanol	<0.34	1884.25	0.018%	12	0
	Ethylbenzene	<0.16	434.19	0.037%	12	0
	Methyl ethyl ketone	<0.12	589.78	0.020%	12	0
	Methylene chloride	<0.27	86.84	0.31%	12	0
	o-Xylene	<0.16	434.19	0.037%	12	0

Table 5. (contd)

Group	Analyte	Conc. (mg/M^3)[(a)]	OEL (mg/M^3)	% of OEL	# of Samples	Results >DL
	Pentane	<0.082	2950.92	0.0028%	12	0
	p-Xylene	<0.16	434.19	0.037%	12	0
	Styrene	<0.26	425.93	0.061%	12	0
	Tetrachloroethene	<0.31	678.12	0.046%	12	0
	Tetrahydrofuran	<0.12	589.78	0.020%	12	0
	Toluene	<0.14	753.62	0.019%	12	0
	Trichloroethylene	<0.24	537.42	0.045%	12	0
RP	Particulate, respirable	0.04	5	0.80%	11	4
SI	Cristobalite	<0.0029	0.05	5.8%	12	0
	Quartz	0.0048	0.05	9.6%	12	1
	Tridymite	<0.0058			2	0
SO	Sulfur dioxide	0.38	5.24	7.3%	10	2
TCTF	1,1,2-Trichlorotrifluoroethane	<0.47	7600	0.0062%	12	0
	Dichlorodifluoromethane	9.4	4945.6	0.19%	12	2
	Total				547	37
				%<DL →	93.2%	6.8%

DL = detection limit.

(a) Represents the highest detected concentration or the highest detection limit if not detected.

(b) Analyte was detected in the field blank at 160 µg which is 40% of the quantity detected on the sample with the maximum concentration of 11 mg/M^3.

(c) Total isocyanate as methylene -bis(4-cyclohexylisocyanate).

(d) Total potassium as potassium hydroxide.

(e) Total sodium as sodium metabisulfite.

Table 6. Summary of Analytes with Detectable Results

Chemical	# >DL	Max Concentration % of OEL	Notes
Acetonitrile	9/11	16%	Found in 2 blanks at up to 7% of OEL
Carbon tetrachloride	2/12	1.3%	
Dichlorodifluoromethane	2/12	0.19%	
Formaldehyde	12/12	2.1%	
Hydrochloric acid	3/7	0.29%	
Nitric acid	3/7	10%	
Particulate, respirable	4/12	0.80%	DL is ~0.6% of OEL
Quartz	1/12	9.6%	DL is ~6% of OEL
Sulfur dioxide	2/11	7.1%	DL is ~6% of OEL

Table 7. Analytical Results Greater Than Detection Limit

SampleDate	Analyte	Results, mg/m^3	OEL mg/m^3	%OEL
8/9/2016	Acetonitrile	11	67.16	16%
8/23/2016	Acetonitrile	11	67.16	16%
8/11/2016	Acetonitrile	9.1	67.16	13%
8/25/2016	Acetonitrile	4.5	67.16	6.7%
8/2/2016	Acetonitrile	0.56	67.16	0.83%
7/26/2016	Acetonitrile	0.24	67.16	0.36%
8/4/2016	Acetonitrile	0.21	67.16	0.31%
7/28/2016	Acetonitrile	0.2	67.16	0.30%
8/18/2016	Acetonitrile	0.16	67.16	0.24%
8/30/2016	Carbon tetrachloride	0.81	62.91	1.3%
8/2/2016	Carbon tetrachloride	0.44	62.91	0.70%
8/30/2016	Dichlorodifluoromethane	9.3	4945.6	0.16%
8/23/2016	Dichlorodifluoromethane	9.4	4945.6	0.16%
8/23/2016	Formaldehyde	0.019	0.92	2.1%
8/25/2016	Formaldehyde	0.019	0.92	2.1%
8/11/2016	Formaldehyde	0.017	0.92	1.8%
8/30/2016	Formaldehyde	0.017	0.92	1.8%
8/16/2016	Formaldehyde	0.014	0.92	1.5%
8/4/2016	Formaldehyde	0.013	0.92	1.4%
7/28/2016	Formaldehyde	0.01	0.92	1.1%
9/1/2016	Formaldehyde	0.0094	0.92	1.0%
8/18/2016	Formaldehyde	0.0092	0.92	1.0%
7/26/2016	Formaldehyde	0.0089	0.92	1.0%
8/9/2016	Formaldehyde	0.0077	0.92	0.84%
8/2/2016	Formaldehyde	0.0076	0.92	0.83%
8/2/2016	Hydrochloric acid	0.087	29.77	0.29%
8/4/2016	Hydrochloric acid	0.023	29.77	0.077%
8/16/2016	Hydrochloric acid	0.023	29.77	0.077%
8/2/2016	Nitric acid	0.52	5.16	10%
8/4/2016	Nitric acid	0.11	5.16	2.1%
8/16/2016	Nitric Acid	0.098	5.16	1.9%
8/16/2016	Particulate, respirable	0.04	5	0.80%
8/4/2016	Particulate, respirable	0.028	5	0.56%

Table 7. (contd)

SampleDate	Analyte	Results, mg/m^3	OEL mg/m^3	%OEL
8/30/2016	Particulate, respirable	0.027	5	0.54%
9/1/2016	Particulate, respirable	0.027	5	0.54%
8/2/2016	Quartz	0.0048	0.05	9.6%
8/23/2016	Sulfur dioxide	0.38	5.24	7.3%
8/16/2016	Sulfur dioxide	0.37	5.24	7.1%

3.2 Comparison to Calculated Emissions

The selection of chemicals of concern in the exhaust stream was based on estimated emissions using chemical inventory data combined with release assumptions (Section 2.2). These estimated concentrations were divided by OELs to provide a ratio, which was used to rank the chemicals and determine which were of greatest concern for the sampling campaign. Sampling results are compared to estimated emissions for those chemicals with measured detectable results in Table 8. Detection limit concentrations are also shown to provide perspective on the measured concentrations. The table shows that calculations underestimated emission concentrations compared to measured concentrations for five analytes, and overestimated or were within the range for three. Respirable particles is a general category for which no calculations were made.

Table 8. Comparison of Estimated Emissions to Measured Emissions

Chemical	Measured Concentration, % of OEL	Estimated Concentration, % of OEL	Detection Limit, % of OEL
Acetonitrile	0.24% - 16%	6.2%	0.18%
Carbon Tetrachloride	0.70% - 1.3%	0.063%	0.46%
Dichlorodifluoromethane	0.19%	0.000092%	0.0081%
Formaldehyde	0.83% - 2.1%	0.17%	0.54%
Hydrochloric Acid	0.077% - 0.29%	0.33%	0.050%
Nitric Acid	1.9% - 10%	0.16%	0.18%
Particulate, Respirable	0.54% - 0.80%		0.60%
Quartz	9.6%	21%	5.8%
Sulfur Dioxide	7.1% - 7.3%	0.66%	5.5%

Estimated emissions for the analytes with all results below detection limits were evaluated by determining whether or not the estimates were above detection limits. Table 9 shows the results of this evaluation. For the first 15 analytes listed, calculations predicted that measured concentrations would be above the detection limit. In these cases, calculations overestimated emission concentrations compared to measurements. For the other 23 analytes, calculations and measurements both resulted in concentrations below detection limits.

Table 9. Comparison of Estimated Concentrations for Analytes with All Results Below Detection Limits

Group	Analyte	Estimated Concentrations >DL?
DMAA	Dimethylformamide	Yes
MET	Methanol	Yes
MTL	Copper	Yes
MTL	Potassium	Yes
NH3	Ammonia	Yes
ORG	Acetone	Yes
ORG	Benzene	Yes
ORG	Ethanol	Yes
ORG	Methyl ethyl ketone	Yes
ORG	Methylene chloride	Yes
ORG	Tetrahydrofuran	Yes
ORG	Toluene	Yes
ORG	Trichloroethylene	Yes
SI	Cristobalite	Yes
SI	Tridymite	Yes
ACID	Phosphoric acid	No
ACR	Acrylonitrile	No
DMAA	Dimethylacetamide	No
EO	Ethylene oxide	No
EPI	Epichlorohydrin	No
ISO	Methylene -bis(4-cyclohexylisocyanate) (H2MDI)	No
MTL	Lead	No
MTL	Sodium	No
ORG	1,1,1-Trichloroethane	No
ORG	1,1-Dichloroethane	No
ORG	1,2,4-Trichlorobenzene	No
ORG	1,2,4-Trimethylbenzene	No
ORG	1,2-Dichlorobenzene	No
ORG	1,2-Dichloroethane	No
ORG	1,4-Dichlorobenzene	No
ORG	Chlorobenzene	No
ORG	Chloroform	No
ORG	Cumene	No
ORG	Ethylbenzene	No
ORG	o-Xylene	No
ORG	Pentane	No
ORG	p-Xylene	No

Table 9. (contd)

Group	Analyte	Estimated Concentrations >DL?
ORG	Styrene	No
ORG	Tetrachloroethene	No
TCTF	1,1,2-Trichlorotrifluoroethane	No

4.0 Conclusion

Sampling for air chemical emissions was performed in the LSL-II ventilation stack over the 6-week period from July 26 to September 1, 2016. The primary purpose of this sampling was to determine the concentration of chemicals emitted from research operations to gain an understanding of potential worker exposures. A total of 12 sampling events were carried out using 16 sample media. The analytical results provided concentration data on 49 analytes. Some summary points derived from this study are as follows:

- Analytic detection limits were all below the OEL for the chemical analyzed.
  - Detection limits as a percent of the OELs ranged from 0.003% (pentane) to 13% (epichlorohydrin).
- Most of the results were below detection limits.
  - All results for 40 of the 49 chemicals were below detection limits.
  - Detection frequency for the nine chemicals with detectable results ranged from 1 in 12 (quartz) to 12 in 12 (acetonitrile).
- Concentrations of chemicals with detectable results were a fraction of the OEL for that chemical.
  - Concentrations as a percent of the OELs ranged from 0.08% (hydrochloric acid) to 16.4% (acetonitrile).
  - Acetonitrile was also detected in three out of six of the field blanks analyzed in quantities comparable to 6.5% of the OEL.
- Calculations underestimated measured concentrations for five chemicals with detectable results and overestimated or were within range for three.
- For the 40 chemicals with nondetectable measured results, calculations predicted that 15 would be above and 25 below the detection limits. Thus 15 were overestimated and 25 did not have low enough detection limits to make the comparison.

This sampling effort will inform other study components to develop a more complete picture of the potential exposure of workers to stack emissions during LSL-II rooftop activities. Mixing studies were conducted to inform spatial variation in concentrations at other rooftop locations and can be used in conjunction with these results, thereby providing temporal variations in concentrations to estimate the potential exposure to workers working in and around the LSL-II stack.

5.0 References

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Appendix A

Sampling Results

Appendix A

Sampling Results

Note that Field Blanks are identified with a "B" in the Event column and that results for field blanks are only given in mass and not in concentration because there is no sample air volume associated with them.

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
7/26/2016	1	ACE	Acetonitrile		7.8		0.24
7/26/2016	1	ACR	Acrylonitrile	<	4	<	0.13
7/26/2016	1	DMAA	Dimethylacetamide	<	4	<	0.19
7/26/2016	1	DMAA	Dimethylformamide	<	10	<	0.43
7/26/2016	1	EO	Ethylene Oxide	<	2	<	0.14
7/26/2016	1	EP1	Epichlorohydrin	<	5	<	0.25
7/26/2016	1	FMH	Formaldehyde		0.17		0.00089
7/26/2016	1	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00012
7/26/2016	1	MET	Methanol	<	10	<	0.91
7/26/2016	1	MTL	Copper	<	1	<	0.000073
7/26/2016	1	MTL	Lead	<	1	<	0.000073
7/26/2016	1	MTL	Potassium	<	10	<	0.00073
7/26/2016	1	MTL	Sodium	<	10	<	0.00073
7/26/2016	1	NH3	Ammonia	<	10	<	0.37
7/26/2016	1	ORG	1,1,1-Trichloroethane	<	5	<	0.24
7/26/2016	1	ORG	1,1-Dichloroethane	<	5	<	0.22
7/26/2016	1	ORG	1,2,4-Trichlorobenzene	<	6	<	0.36
7/26/2016	1	ORG	1,2,4-Trimethylbenzene	<	3	<	0.17
7/26/2016	1	ORG	1,2-Dichlorobenzene	<	6	<	0.32
7/26/2016	1	ORG	1,2-Dichloroethane	<	5	<	0.22
7/26/2016	1	ORG	1,4-Dichlorobenzene	<	6	<	0.32
7/26/2016	1	ORG	Acetone	<	4	<	0.15
7/26/2016	1	ORG	Benzene	<	1	<	0.04
7/26/2016	1	ORG	Carbon Tetrachloride	<	6	<	0.29
7/26/2016	1	ORG	Chlorobenzene	<	5	<	0.25
7/26/2016	1	ORG	Chloroform	<	6	<	0.26
7/26/2016	1	ORG	Cumene	<	3	<	0.18
7/26/2016	1	ORG	Ethanol	<	10	<	0.34
7/26/2016	1	ORG	Ethylbenzene	<	3	<	0.16
7/26/2016	1	ORG	Methyl Ethyl Ketone	<	3	<	0.12
7/26/2016	1	ORG	Methylene Chloride	<	7	<	0.27

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
7/26/2016	1	ORG	o-Xylene	<	3	<	0.16
7/26/2016	1	ORG	Pentane	<	2	<	0.08
7/26/2016	1	ORG	p-Xylene	<	3	<	0.16
7/26/2016	1	ORG	Styrene	<	5	<	0.26
7/26/2016	1	ORG	Tetrachloroethene	<	6	<	0.31
7/26/2016	1	ORG	Tetrahydrofuran	<	3	<	0.12
7/26/2016	1	ORG	Toluene	<	3	<	0.14
7/26/2016	1	ORG	Trichloroethylene	<	5	<	0.24
7/26/2016	1	RP	Particulate, Respirable	<	50	<	0.02
7/26/2016	1	S0	Sulfur Dioxide	<	3	<	0.29
7/26/2016	1	S1	Cristobalite	<	5	<	0.00029
7/26/2016	1	S1	Quartz	<	5	<	0.00029
7/26/2016	1	S1	Tridymite	<	10	<	0.00058
7/26/2016	1	TCTF	1,1,2-Trichlorotrifluoroethane	<	10	<	0.47
7/26/2016	1	TCTF	Dichlorodifluoromethane	<	10	<	0.4
7/28/2016	2	ACE	Acetonitrile		6.8		0.2
7/28/2016	2	ACID	Hydrochloric Acid	<	5	<	0.01
7/28/2016	2	ACID	Nitric Acid	<	3	<	0.00087
7/28/2016	2	ACID	Phosphoric Acid	<	8	<	0.02
7/28/2016	2	ACR	Acrylonitrile	<	4	<	0.06
7/28/2016	2	DMAA	Dimethylacetamide	<	4	<	0.18
7/28/2016	2	DMAA	Dimethylformamide	<	10	<	0.4
7/28/2016	2	EO	Ethylene Oxide	<	2	<	0.13
7/28/2016	2	EP1	Epichlorohydrin	<	5	<	0.24
7/28/2016	2	FMH	Formaldehyde		0.23		0.01
7/28/2016	2	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00011
7/28/2016	2	MET	Methanol	<	10	<	0.87
7/28/2016	2	MTL	Copper	<	1	<	0.000069
7/28/2016	2	MTL	Lead	<	1	<	0.000069
7/28/2016	2	MTL	Potassium	<	10	<	0.00069
7/28/2016	2	MTL	Sodium	<	10	<	0.00069
7/28/2016	2	NH3	Ammonia	<	10	<	0.35
7/28/2016	2	ORG	1,1,1-Trichloroethane	<	5	<	0.23
7/28/2016	2	ORG	1,1-Dichloroethane	<	5	<	0.21
7/28/2016	2	ORG	1,2,4-Trichlorobenzene	<	6	<	0.34
7/28/2016	2	ORG	1,2,4-Trimethylbenzene	<	3	<	0.16
7/28/2016	2	ORG	1,2-Dichlorobenzene	<	6	<	0.3
7/28/2016	2	ORG	1,2-Dichloroethane	<	5	<	0.21

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
7/28/2016	2	ORG	1,4-Dichlorobenzene	<	6	<	0.3
7/28/2016	2	ORG	Acetone	<	4	<	0.14
7/28/2016	2	ORG	Benzene	<	1	<	0.04
7/28/2016	2	ORG	Carbon Tetrachloride	<	6	<	0.28
7/28/2016	2	ORG	Chlorobenzene	<	5	<	0.24
7/28/2016	2	ORG	Chloroform	<	6	<	0.25
7/28/2016	2	ORG	Cumene	<	3	<	0.17
7/28/2016	2	ORG	Ethanol	<	10	<	0.32
7/28/2016	2	ORG	Ethylbenzene	<	3	<	0.15
7/28/2016	2	ORG	Methyl Ethyl Ketone	<	3	<	0.12
7/28/2016	2	ORG	Methylene Chloride	<	7	<	0.26
7/28/2016	2	ORG	o-Xylene	<	3	<	0.15
7/28/2016	2	ORG	Pentane	<	2	<	0.08
7/28/2016	2	ORG	p-Xylene	<	3	<	0.15
7/28/2016	2	ORG	Styrene	<	5	<	0.24
7/28/2016	2	ORG	Tetrachloroethene	<	6	<	0.3
7/28/2016	2	ORG	Tetrahydrofuran	<	3	<	0.11
7/28/2016	2	ORG	Toluene	<	3	<	0.13
7/28/2016	2	ORG	Trichloroethylene	<	5	<	0.23
7/28/2016	2	RP	Particulate, Respirable	<	50	<	0.02
7/28/2016	2	S0	Sulfur Dioxide	<	3	<	0.28
7/28/2016	2	S1	Cristobalite	<	5	<	0.00028
7/28/2016	2	S1	Quartz	<	5	<	0.00028
7/28/2016	2	S1	Tridymite	<	10	<	0.00056
7/28/2016	2	TCTF	1,1,2-Trichlorotrifluoroethane	<	10	<	0.45
7/28/2016	2	TCTF	Dichlorodifluoromethane	<	10	<	0.39
7/28/2016	3B	ACE	Acetonitrile	<	4		
7/28/2016	3B	ACID	Hydrochloric Acid	<	5		
7/28/2016	3B	ACID	Nitric Acid	<	3		
7/28/2016	3B	ACID	Phosphoric Acid	<	8		
7/28/2016	3B	ACR	Acrylonitrile	<	4		
7/28/2016	3B	DMAA	Dimethylacetamide	<	4		
7/28/2016	3B	DMAA	Dimethylformamide	<	10		
7/28/2016	3B	EO	Ethylene Oxide	<	2		
7/28/2016	3B	EP1	Epichlorohydrin	<	5		
7/28/2016	3B	FMH	Formaldehyde	<	0.1		
7/28/2016	3B	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4		
7/28/2016	3B	MET	Methanol	<	10		

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
7/28/2016	3B	MTL	Copper	<	1		
7/28/2016	3B	MTL	Lead	<	1		
7/28/2016	3B	MTL	Potassium	<	10		
7/28/2016	3B	MTL	Sodium	<	10		
7/28/2016	3B	NH3	Ammonia	<	10		
7/28/2016	3B	ORG	1,1,1-Trichloroethane	<	5		
7/28/2016	3B	ORG	1,1-Dichloroethane	<	5		
7/28/2016	3B	ORG	1,2,4-Trichlorobenzene	<	6		
7/28/2016	3B	ORG	1,2,4-Trimethylbenzene	<	3		
7/28/2016	3B	ORG	1,2-Dichlorobenzene	<	6		
7/28/2016	3B	ORG	1,2-Dichloroethane	<	5		
7/28/2016	3B	ORG	1,4-Dichlorobenzene	<	6		
7/28/2016	3B	ORG	Acetone	<	4		
7/28/2016	3B	ORG	Benzene	<	1		
7/28/2016	3B	ORG	Carbon Tetrachloride	<	6		
7/28/2016	3B	ORG	Chlorobenzene	<	5		
7/28/2016	3B	ORG	Chloroform	<	6		
7/28/2016	3B	ORG	Cumene	<	3		
7/28/2016	3B	ORG	Ethanol	<	10		
7/28/2016	3B	ORG	Ethylbenzene	<	3		
7/28/2016	3B	ORG	Methyl Ethyl Ketone	<	3		
7/28/2016	3B	ORG	Methylene Chloride	<	7		
7/28/2016	3B	ORG	o-Xylene	<	3		
7/28/2016	3B	ORG	Pentane	<	2		
7/28/2016	3B	ORG	p-Xylene	<	3		
7/28/2016	3B	ORG	Styrene	<	5		
7/28/2016	3B	ORG	Tetrachloroethene	<	6		
7/28/2016	3B	ORG	Tetrahydrofuran	<	3		
7/28/2016	3B	ORG	Toluene	<	3		
7/28/2016	3B	ORG	Trichloroethylene	<	5		
7/28/2016	3B	S0	Sulfur Dioxide	<	3		
7/28/2016	3B	S1	Cristobalite	<	5		
7/28/2016	3B	S1	Quartz	<	5		
7/28/2016	3B	S1	Tridymite	<	10		
7/28/2016	3B	TCTF	1,1,2-Trichlorotrifluoroethane	<	10		
7/28/2016	3B	TCTF	Dichlorodifluoromethane	<	10		
8/2/2016	4	ACE	Acetonitrile		19		0.56
8/2/2016	4	ACID	Hydrochloric Acid		34		0.087

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/2/2016	4	ACID	Nitric Acid		200		0.52
8/2/2016	4	ACID	Phosphoric Acid	<	8	<	0.02
8/2/2016	4	ACR	Acrylonitrile	<	4	<	0.13
8/2/2016	4	DMAA	Dimethylacetamide	<	4	<	0.18
8/2/2016	4	DMAA	Dimethylformamide	<	10	<	0.4
8/2/2016	4	EO	Ethylene Oxide	<	2	<	0.13
8/2/2016	4	EPI	Epichlorohydrin	<	5	<	0.24
8/2/2016	4	FMH	Formaldehyde		0.15		0.0076
8/2/2016	4	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00056
8/2/2016	4	MET	Methanol	<	10	<	0.87
8/2/2016	4	MTL	Copper	<	1	<	0.00069
8/2/2016	4	MTL	Lead	<	1	<	0.00069
8/2/2016	4	MTL	Potassium	<	10	<	0.0069
8/2/2016	4	MTL	Sodium	<	10	<	0.0069
8/2/2016	4	NH3	Ammonia	<	10	<	0.35
8/2/2016	4	ORG	1,1,1-Trichloroethane	<	5	<	0.23
8/2/2016	4	ORG	1,1-Dichloroethane	<	5	<	0.21
8/2/2016	4	ORG	1,2,4-Trichlorobenzene	<	6	<	0.34
8/2/2016	4	ORG	1,2,4-Trimethylbenzene	<	3	<	0.16
8/2/2016	4	ORG	1,2-Dichlorobenzene	<	6	<	0.3
8/2/2016	4	ORG	1,2-Dichloroethane	<	5	<	0.21
8/2/2016	4	ORG	1,4-Dichlorobenzene	<	6	<	0.3
8/2/2016	4	ORG	Benzene	<	1	<	0.04
8/2/2016	4	ORG	Carbon Tetrachloride		9.5		0.44
8/2/2016	4	ORG	Chlorobenzene	<	5	<	0.24
8/2/2016	4	ORG	Chloroform	<	6	<	0.25
8/2/2016	4	ORG	Cumene	<	3	<	0.17
8/2/2016	4	ORG	Ethanol	<	10	<	0.32
8/2/2016	4	ORG	Ethylbenzene	<	3	<	0.15
8/2/2016	4	ORG	Methyl Ethyl Ketone	<	3	<	0.12
8/2/2016	4	ORG	Methylene Chloride	<	7	<	0.26
8/2/2016	4	ORG	o-Xylene	<	3	<	0.15
8/2/2016	4	ORG	Pentane	<	2	<	0.08
8/2/2016	4	ORG	p-Xylene	<	3	<	0.15
8/2/2016	4	ORG	Styrene	<	5	<	0.24
8/2/2016	4	ORG	Tetrachloroethene	<	6	<	0.3
8/2/2016	4	ORG	Tetrahydrofuran	<	3	<	0.11
8/2/2016	4	ORG	Toluene	<	3	<	0.13

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/2/2016	4	ORG	Trichloroethylene	<	5	<	0.23
8/2/2016	4	RP	Particulate, Respirable	<	50	<	0.028
8/2/2016	4	SI	Cristobalite	<	5	<	0.0028
8/2/2016	4	SI	Quartz		8.8		0.0048
8/2/2016	4	SO	Sulfur Dioxide	<	3	<	0.28
8/4/2016	5	ACE	Acetonitrile		7.3		0.21
8/4/2016	5	ACR	Acrylonitrile	<	4	<	0.13
8/4/2016	5	DMAA	Dimethylacetamide	<	4	<	0.17
8/4/2016	5	DMAA	Dimethylformamide	<	10	<	0.39
8/4/2016	5	EO	Ethylene Oxide	<	2	<	0.13
8/4/2016	5	EPI	Epichlorohydrin	<	5	<	0.24
8/4/2016	5	FMH	Formaldehyde		0.26		0.013
8/4/2016	5	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00075
8/4/2016	5	MET	Methanol	<	10	<	0.86
8/4/2016	5	MTL	Copper	<	1	<	0.00069
8/4/2016	5	MTL	Lead	<	1	<	0.00069
8/4/2016	5	MTL	Potassium	<	10	<	0.0069
8/4/2016	5	MTL	Sodium	<	10	<	0.0069
8/4/2016	5	NH3	Ammonia	<	10	<	0.35
8/4/2016	5	ORG	1,1,1-Trichloroethane	<	5	<	0.23
8/4/2016	5	ORG	1,1-Dichloroethane	<	5	<	0.21
8/4/2016	5	ORG	1,2,4-Trichlorobenzene	<	6	<	0.34
8/4/2016	5	ORG	1,2,4-Trimethylbenzene	<	3	<	0.16
8/4/2016	5	ORG	1,2-Dichlorobenzene	<	6	<	0.3
8/4/2016	5	ORG	1,2-Dichloroethane	<	5	<	0.21
8/4/2016	5	ORG	1,4-Dichlorobenzene	<	6	<	0.3
8/4/2016	5	ORG	Benzene	<	1	<	0.039
8/4/2016	5	ORG	Carbon Tetrachloride	<	6	<	0.28
8/4/2016	5	ORG	Chlorobenzene	<	5	<	0.24
8/4/2016	5	ORG	Chloroform	<	6	<	0.25
8/4/2016	5	ORG	Cumene	<	3	<	0.17
8/4/2016	5	ORG	Ethanol	<	10	<	0.32
8/4/2016	5	ORG	Ethylbenzene	<	3	<	0.15
8/4/2016	5	ORG	Methyl Ethyl Ketone	<	3	<	0.12
8/4/2016	5	ORG	Methylene Chloride	<	7	<	0.26
8/4/2016	5	ORG	o-Xylene	<	3	<	0.15
8/4/2016	5	ORG	Pentane	<	2	<	0.079
8/4/2016	5	ORG	p-Xylene	<	3	<	0.15

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/4/2016	5	ORG	Styrene	<	5	<	0.24
8/4/2016	5	ORG	Tetrachloroethene	<	6	<	0.3
8/4/2016	5	ORG	Tetrahydrofuran	<	3	<	0.11
8/4/2016	5	ORG	Toluene	<	3	<	0.13
8/4/2016	5	ORG	Trichloroethylene	<	5	<	0.22
8/4/2016	5	RP	Particulate, Respirable		50		0.028
8/4/2016	5	SI	Cristobalite	<	5	<	0.0027
8/4/2016	5	SI	Quartz	<	5	<	0.0027
8/4/2016	5	SO	Sulfur Dioxide	<	3	<	0.27
8/4/2016	6B	ACE	Acetonitrile		19		
8/4/2016	6B	ACID	Hydrochloric Acid	<	5		
8/4/2016	6B	ACID	Nitric Acid	<	3		
8/4/2016	6B	ACID	Phosphoric Acid	<	8		
8/4/2016	6B	ACR	Acrylonitrile	<	4		
8/4/2016	6B	DMAA	Dimethylacetamide	<	4		
8/4/2016	6B	DMAA	Dimethylformamide	<	10		
8/4/2016	6B	EO	Ethylene Oxide	<	2		
8/4/2016	6B	EPI	Epichlorohydrin	<	5		
8/4/2016	6B	FMH	Formaldehyde	<	0.1		
8/4/2016	6B	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4		
8/4/2016	6B	MET	Methanol	<	10		
8/4/2016	6B	MTL	Copper	<	1		
8/4/2016	6B	MTL	Lead	<	1		
8/4/2016	6B	MTL	Potassium	<	10		
8/4/2016	6B	MTL	Sodium	<	10		
8/4/2016	6B	NH3	Ammonia	<	10		
8/4/2016	6B	ORG	1,1,1-Trichloroethane	<	5		
8/4/2016	6B	ORG	1,1-Dichloroethane	<	5		
8/4/2016	6B	ORG	1,2,4-Trichlorobenzene	<	6		
8/4/2016	6B	ORG	1,2,4-Trimethylbenzene	<	3		
8/4/2016	6B	ORG	1,2-Dichlorobenzene	<	6		
8/4/2016	6B	ORG	1,2-Dichloroethane	<	5		
8/4/2016	6B	ORG	1,4-Dichlorobenzene	<	6		
8/4/2016	6B	ORG	Benzene	<	1		
8/4/2016	6B	ORG	Carbon Tetrachloride	<	6		
8/4/2016	6B	ORG	Chlorobenzene	<	5		
8/4/2016	6B	ORG	Chloroform	<	6		
8/4/2016	6B	ORG	Cumene	<	3		

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/4/2016	6B	ORG	Ethanol	<	10		
8/4/2016	6B	ORG	Ethylbenzene	<	3		
8/4/2016	6B	ORG	Methyl Ethyl Ketone	<	3		
8/4/2016	6B	ORG	Methylene Chloride	<	7		
8/4/2016	6B	ORG	o-Xylene	<	3		
8/4/2016	6B	ORG	Pentane	<	2		
8/4/2016	6B	ORG	p-Xylene	<	3		
8/4/2016	6B	ORG	Styrene	<	5		
8/4/2016	6B	ORG	Tetrachloroethene	<	6		
8/4/2016	6B	ORG	Tetrahydrofuran	<	3		
8/4/2016	6B	ORG	Toluene	<	3		
8/4/2016	6B	ORG	Trichloroethylene	<	5		
8/4/2016	6B	SI	Cristobalite	<	5		
8/4/2016	6B	SI	Quartz	<	5		
8/4/2016	6B	SO	Sulfur Dioxide	<	3		
8/9/2016	7	ACE	Acetonitrile		400		11
8/9/2016	7	ACID	Hydrochloric Acid	<	5	<	0.014
8/9/2016	7	ACID	Nitric Acid	<	3	<	0.0083
8/9/2016	7	ACID	Phosphoric Acid	<	8	<	0.022
8/9/2016	7	ACR	Acrylonitrile	<	4	<	0.13
8/9/2016	7	DMAA	1,1,1-Trichloroethane	<	5	<	0.22
8/9/2016	7	DMAA	1,1-Dichloroethane	<	5	<	0.21
8/9/2016	7	DMAA	1,2,4-Trichlorobenzene	<	6	<	0.34
8/9/2016	7	DMAA	1,2,4-Trimethylbenzene	<	3	<	0.16
8/9/2016	7	DMAA	1,2-Dichlorobenzene	<	6	<	0.3
8/9/2016	7	DMAA	1,2-Dichloroethane	<	5	<	0.21
8/9/2016	7	DMAA	1,4-Dichlorobenzene	<	6	<	0.3
8/9/2016	7	DMAA	Acetone	<	4	<	0.14
8/9/2016	7	DMAA	Benzene	<	1	<	0.039
8/9/2016	7	DMAA	Carbon Tetrachloride	<	6	<	0.28
8/9/2016	7	DMAA	Chlorobenzene	<	5	<	0.24
8/9/2016	7	DMAA	Chloroform	<	6	<	0.25
8/9/2016	7	DMAA	Cumene	<	3	<	0.17
8/9/2016	7	DMAA	Ethanol	<	10	<	0.32
8/9/2016	7	DMAA	Ethylbenzene	<	3	<	0.15
8/9/2016	7	DMAA	Methyl Ethyl Ketone	<	3	<	0.11
8/9/2016	7	DMAA	Methylene Chloride	<	7	<	0.26
8/9/2016	7	DMAA	o-Xylene	<	3	<	0.15

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/9/2016	7	DMAA	Pentane	<	2	<	0.079
8/9/2016	7	DMAA	p-Xylene	<	3	<	0.15
8/9/2016	7	DMAA	Styrene	<	5	<	0.24
8/9/2016	7	DMAA	Tetrachloroethene	<	6	<	0.29
8/9/2016	7	DMAA	Tetrahydrofuran	<	3	<	0.11
8/9/2016	7	DMAA	Toluene	<	3	<	0.13
8/9/2016	7	DMAA	Trichloroethylene	<	5	<	0.22
8/9/2016	7	EO	Ethylene Oxide	<	2	<	0.055
8/9/2016	7	EPI	Epichlorohydrin	<	5	<	0.23
8/9/2016	7	FMH	Formaldehyde		0.16		0.0077
8/9/2016	7	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00056
8/9/2016	7	MTL	Copper	<	1	<	0.00069
8/9/2016	7	MTL	Lead	<	1	<	0.00069
8/9/2016	7	MTL	Potassium	<	10	<	0.0069
8/9/2016	7	MTL	Sodium	<	10	<	0.0069
8/9/2016	7	NH3	Ammonia	<	10	<	0.35
8/9/2016	7	ORG	Dimethylacetamide	<	4	<	0.17
8/9/2016	7	ORG	Dimethylformamide	<	10	<	0.39
8/9/2016	7	RP	Particulate, Respirable	<	50	<	0.028
8/9/2016	7	SI	Cristobalite	<	5	<	0.0028
8/9/2016	7	SI	Quartz	<	5	<	0.0028
8/9/2016	7	SO	Sulfur Dioxide	<	3	<	0.28
8/9/2016	7	TCIF	1,1,2-Trichlorotrifluoroethane	<	10	<	0.44
8/9/2016	7	TCIF	Dichlorodifluoromethane	<	10	<	0.38
8/11/2016	8	ACE	Acetonitrile		320		9.1
8/11/2016	8	ACID	Hydrochloric Acid	<	5	<	0.014
8/11/2016	8	ACID	Nitric Acid	<	3	<	0.0083
8/11/2016	8	ACID	Phosphoric Acid	<	8	<	0.022
8/11/2016	8	ACR	Acrylonitrile	<	4	<	0.13
8/11/2016	8	DMAA	1,1,1-Trichloroethane	<	5	<	0.22
8/11/2016	8	DMAA	1,1-Dichloroethane	<	5	<	0.21
8/11/2016	8	DMAA	1,2,4-Trichlorobenzene	<	6	<	0.33
8/11/2016	8	DMAA	1,2,4-Trimethylbenzene	<	3	<	0.16
8/11/2016	8	DMAA	1,2-Dichlorobenzene	<	6	<	0.3
8/11/2016	8	DMAA	1,2-Dichloroethane	<	5	<	0.21
8/11/2016	8	DMAA	1,4-Dichlorobenzene	<	6	<	0.3
8/11/2016	8	DMAA	Acetone	<	4	<	0.14
8/11/2016	8	DMAA	Benzene	<	1	<	0.039

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/11/2016	8	DMAA	Carbon Tetrachloride	<	6	<	0.27
8/11/2016	8	DMAA	Chlorobenzene	<	5	<	0.24
8/11/2016	8	DMAA	Chloroform	<	6	<	0.25
8/11/2016	8	DMAA	Cumene	<	3	<	0.17
8/11/2016	8	DMAA	Ethanol	<	10	<	0.32
8/11/2016	8	DMAA	Ethylbenzene	<	3	<	0.15
8/11/2016	8	DMAA	Methyl Ethyl Ketone	<	3	<	0.11
8/11/2016	8	DMAA	Methylene Chloride	<	7	<	0.25
8/11/2016	8	DMAA	o-Xylene	<	3	<	0.15
8/11/2016	8	DMAA	Pentane	<	2	<	0.078
8/11/2016	8	DMAA	p-Xylene	<	3	<	0.15
8/11/2016	8	DMAA	Styrene	<	5	<	0.24
8/11/2016	8	DMAA	Tetrachloroethene	<	6	<	0.29
8/11/2016	8	DMAA	Tetrahydrofuran	<	3	<	0.11
8/11/2016	8	DMAA	Toluene	<	3	<	0.13
8/11/2016	8	DMAA	Trichloroethylene	<	5	<	0.22
8/11/2016	8	EO	Ethylene Oxide	<	2	<	0.056
8/11/2016	8	EPI	Epichlorohydrin	<	5	<	0.23
8/11/2016	8	FMH	Formaldehyde		0.35		0.017
8/11/2016	8	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00055
8/11/2016	8	MTL	Copper	<	1	<	0.00068
8/11/2016	8	MTL	Lead	<	1	<	0.00068
8/11/2016	8	MTL	Potassium	<	10	<	0.0068
8/11/2016	8	MTL	Sodium	<	10	<	0.0068
8/11/2016	8	NH3	Ammonia	<	10	<	0.35
8/11/2016	8	ORG	Dimethylacetamide	<	4	<	0.17
8/11/2016	8	ORG	Dimethylformamide	<	10	<	0.39
8/11/2016	8	RP	Particulate, Respirable	<	50		
8/11/2016	8	SI	Cristobalite	<	5	<	0.0027
8/11/2016	8	SI	Quartz	<	5	<	0.0027
8/11/2016	8	SO	Sulfur Dioxide	<	3	<	0.27
8/11/2016	8	TCIF	1,1,2-Trichlorotrifluoroethane	<	10	<	0.44
8/11/2016	8	TCIF	Dichlorodifluoromethane	<	10	<	0.38
8/11/2016	9B	ACE	Acetonitrile		160		
8/11/2016	9B	ACID	Hydrochloric Acid	<	5		
8/11/2016	9B	ACID	Nitric Acid	<	3		
8/11/2016	9B	ACID	Phosphoric Acid	<	8		
8/11/2016	9B	ACR	Acrylonitrile	<	4		

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/11/2016	9B	DMAA	1,1,1-Trichloroethane	<	5		
8/11/2016	9B	DMAA	1,1-Dichloroethane	<	5		
8/11/2016	9B	DMAA	1,2,4-Trichlorobenzene	<	6		
8/11/2016	9B	DMAA	1,2,4-Trimethylbenzene	<	3		
8/11/2016	9B	DMAA	1,2-Dichlorobenzene	<	6		
8/11/2016	9B	DMAA	1,2-Dichloroethane	<	5		
8/11/2016	9B	DMAA	1,4-Dichlorobenzene	<	6		
8/11/2016	9B	DMAA	Acetone	<	4		
8/11/2016	9B	DMAA	Benzene	<	1		
8/11/2016	9B	DMAA	Carbon Tetrachloride	<	6		
8/11/2016	9B	DMAA	Chlorobenzene	<	5		
8/11/2016	9B	DMAA	Chloroform	<	6		
8/11/2016	9B	DMAA	Cumene	<	3		
8/11/2016	9B	DMAA	Ethanol	<	10		
8/11/2016	9B	DMAA	Ethylbenzene	<	3		
8/11/2016	9B	DMAA	Methyl Ethyl Ketone	<	3		
8/11/2016	9B	DMAA	Methylene Chloride	<	7		
8/11/2016	9B	DMAA	o-Xylene	<	3		
8/11/2016	9B	DMAA	Pentane	<	2		
8/11/2016	9B	DMAA	p-Xylene	<	3		
8/11/2016	9B	DMAA	Styrene	<	5		
8/11/2016	9B	DMAA	Tetrachloroethene	<	6		
8/11/2016	9B	DMAA	Tetrahydrofuran	<	3		
8/11/2016	9B	DMAA	Toluene	<	3		
8/11/2016	9B	DMAA	Trichloroethylene	<	5		
8/11/2016	9B	EO	Ethylene Oxide	<	2		
8/11/2016	9B	EPI	Epichlorohydrin	<	5		
8/11/2016	9B	FMH	Formaldehyde	<	0.1		
8/11/2016	9B	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4		
8/11/2016	9B	MTL	Copper	<	1		
8/11/2016	9B	MTL	Lead	<	1		
8/11/2016	9B	MTL	Potassium	<	10		
8/11/2016	9B	MTL	Sodium	<	10		
8/11/2016	9B	NH3	Ammonia	<	10		
8/11/2016	9B	ORG	Dimethylacetamide	<	4		
8/11/2016	9B	ORG	Dimethylformamide	<	10		
8/11/2016	9B	RP	Particulate, Respirable	<	50		
8/11/2016	9B	SI	Cristobalite	<	5		

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/11/2016	9B	SI	Quartz	<	5		
8/11/2016	9B	SO	Sulfur Dioxide	<	3		
8/11/2016	9B	TCIF	1,1,2-Trichlorotrifluoroethane	<	10		
8/11/2016	9B	TCIF	Dichlorodifluoromethane	<	10		
8/16/2016	10	ACE	Acetonitrile	<	4	<	0.12
8/16/2016	10	ACID	Hydrochloric Acid		7.3		0.023
8/16/2016	10	ACID	Nitric Acid		31		0.098
8/16/2016	10	ACID	Phosphoric Acid	<	8	<	0.025
8/16/2016	10	ACR	Acrylonitrile	<	4	<	0.13
8/16/2016	10	DMAA	Dimethylacetamide	<	4	<	0.18
8/16/2016	10	DMAA	Dimethylformamide	<	10	<	0.4
8/16/2016	10	EO	Ethylene Oxide	<	2	<	0.058
8/16/2016	10	EPI	Epichlorohydrin	<	5	<	0.24
8/16/2016	10	FMH	Formaldehyde		0.28		0.014
8/16/2016	10	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00057
8/16/2016	10	MET	Methanol	<	10	<	0.88
8/16/2016	10	NH3	Ammonia	<	10	<	0.36
8/16/2016	10	Org	1,1,1-Trichloroethane	<	5	<	0.23
8/16/2016	10	Org	1,1-Dichloroethane	<	5	<	0.22
8/16/2016	10	Org	1,2,4-Trichlorobenzene	<	6	<	0.35
8/16/2016	10	Org	1,2,4-Trimethylbenzene	<	3	<	0.16
8/16/2016	10	Org	1,2-Dichlorobenzene	<	6	<	0.31
8/16/2016	10	Org	1,2-Dichloroethane	<	5	<	0.22
8/16/2016	10	Org	1,4-Dichlorobenzene	<	6	<	0.31
8/16/2016	10	Org	Acetone	<	4	<	0.14
8/16/2016	10	Org	Benzene	<	1	<	0.04
8/16/2016	10	Org	Carbon Tetrachloride	<	6	<	0.28
8/16/2016	10	Org	Chlorobenzene	<	5	<	0.24
8/16/2016	10	Org	Chloroform	<	6	<	0.26
8/16/2016	10	Org	Cumene	<	3	<	0.18
8/16/2016	10	Org	Ethanol	<	10	<	0.33
8/16/2016	10	Org	Ethylbenzene	<	3	<	0.16
8/16/2016	10	Org	Methyl Ethyl Ketone	<	3	<	0.12
8/16/2016	10	Org	Methylene Chloride	<	7	<	0.26
8/16/2016	10	Org	o-Xylene	<	3	<	0.16
8/16/2016	10	Org	Pentane	<	2	<	0.081
8/16/2016	10	Org	p-Xylene	<	3	<	0.16
8/16/2016	10	Org	Styrene	<	5	<	0.25

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/16/2016	10	Org	Tetrachloroethene	<	6	<	0.3
8/16/2016	10	Org	Tetrahydrofuran	<	3	<	0.12
8/16/2016	10	Org	Toluene	<	3	<	0.14
8/16/2016	10	Org	Trichloroethylene	<	5	<	0.23
8/16/2016	10	RP	Particulate, Respirable		70		0.04
8/16/2016	10	Si	Cristobalite	<	5	<	0.0028
8/16/2016	10	Si	Quartz	<	5	<	0.0028
8/16/2016	10	SO	Sulfur Dioxide		3.9		0.37
8/16/2016	10	TCTF	1,1,2-Trichlorotrifluoroethane	<	10	<	0.46
8/16/2016	10	TCTF	Dichlorodifluoromethane	<	10	<	0.39
8/18/2016	11	ACE	Acetonitrile		5.2		0.16
8/18/2016	11	ACID	Hydrochloric Acid	<	5	<	0.015
8/18/2016	11	ACID	Nitric Acid	<	3	<	0.0093
8/18/2016	11	ACID	Phosphoric Acid	<	8	<	0.025
8/18/2016	11	ACR	Acrylonitrile	<	4	<	0.13
8/18/2016	11	DMAA	Dimethylacetamide	<	4	<	0.18
8/18/2016	11	DMAA	Dimethylformamide	<	10	<	0.41
8/18/2016	11	EO	Ethylene Oxide	<	2	<	0.059
8/18/2016	11	EPI	Epichlorohydrin	<	5	<	0.24
8/18/2016	11	FMH	Formaldehyde		0.18		0.0092
8/18/2016	11	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00058
8/18/2016	11	MET	Methanol	<	10	<	0.89
8/18/2016	11	MTL	Copper	<	1	<	0.00072
8/18/2016	11	MTL	Lead	<	1	<	0.00072
8/18/2016	11	MTL	Potassium	<	10	<	0.0072
8/18/2016	11	MTL	Sodium	<	10	<	0.0072
8/18/2016	11	NH3	Ammonia	<	10	<	0.36
8/18/2016	11	Org	1,1,1-Trichloroethane	<	5	<	0.23
8/18/2016	11	Org	1,1-Dichloroethane	<	5	<	0.22
8/18/2016	11	Org	1,2,4-Trichlorobenzene	<	6	<	0.35
8/18/2016	11	Org	1,2,4-Trimethylbenzene	<	3	<	0.17
8/18/2016	11	Org	1,2-Dichlorobenzene	<	6	<	0.31
8/18/2016	11	Org	1,2-Dichloroethane	<	5	<	0.22
8/18/2016	11	Org	1,4-Dichlorobenzene	<	6	<	0.31
8/18/2016	11	Org	Acetone	<	4	<	0.14
8/18/2016	11	Org	Benzene	<	1	<	0.041
8/18/2016	11	Org	Carbon Tetrachloride	<	6	<	0.29
8/18/2016	11	Org	Chlorobenzene	<	5	<	0.25

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/18/2016	11	Org	Chloroform	<	6	<	0.26
8/18/2016	11	Org	Cumene	<	3	<	0.18
8/18/2016	11	Org	Ethanol	<	10	<	0.33
8/18/2016	11	Org	Ethylbenzene	<	3	<	0.16
8/18/2016	11	Org	Methyl Ethyl Ketone	<	3	<	0.12
8/18/2016	11	Org	Methylene Chloride	<	7	<	0.27
8/18/2016	11	Org	o-Xylene	<	3	<	0.16
8/18/2016	11	Org	Pentane	<	2	<	0.082
8/18/2016	11	Org	p-Xylene	<	3	<	0.16
8/18/2016	11	Org	Styrene	<	5	<	0.25
8/18/2016	11	Org	Tetrachloroethene	<	6	<	0.31
8/18/2016	11	Org	Tetrahydrofuran	<	3	<	0.12
8/18/2016	11	Org	Toluene	<	3	<	0.14
8/18/2016	11	Org	Trichloroethylene	<	5	<	0.23
8/18/2016	11	RP	Particulate, Respirable	<	50	<	0.03
8/18/2016	11	Si	Cristobalite	<	5	<	0.0029
8/18/2016	11	Si	Quartz	<	5	<	0.0029
8/18/2016	11	SO	Sulfur Dioxide	<	3	<	0.29
8/18/2016	11	TCTF	1,1,2-Trichlorotrifluoroethane	<	10	<	0.46
8/18/2016	11	TCTF	Dichlorodifluoromethane	<	10	<	0.4
8/18/2016	12B	ACE	Acetonitrile	<	4		
8/18/2016	12B	ACID	Hydrochloric Acid	<	5		
8/18/2016	12B	ACID	Nitric Acid	<	3		
8/18/2016	12B	ACID	Phosphoric Acid	<	8		
8/18/2016	12B	ACR	Acrylonitrile	<	4		
8/18/2016	12B	DMAA	Dimethylacetamide	<	4		
8/18/2016	12B	DMAA	Dimethylformamide	<	10		
8/18/2016	12B	EO	Ethylene Oxide	<	2		
8/18/2016	12B	EPI	Epichlorohydrin	<	5		
8/18/2016	12B	FMH	Formaldehyde	<	0.1		
8/18/2016	12B	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4		
8/18/2016	12B	MET	Methanol	<	10		
8/18/2016	12B	MTL	Copper	<	1		
8/18/2016	12B	MTL	Lead	<	1		
8/18/2016	12B	MTL	Potassium	<	10		
8/18/2016	12B	MTL	Sodium	<	10		
8/18/2016	12B	NH3	Ammonia	<	10		
8/18/2016	12B	Org	1,1,1-Trichloroethane	<	5		

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/18/2016	12B	Org	1,1-Dichloroethane	<	5		
8/18/2016	12B	Org	1,2,4-Trichlorobenzene	<	6		
8/18/2016	12B	Org	1,2,4-Trimethylbenzene	<	3		
8/18/2016	12B	Org	1,2-Dichlorobenzene	<	6		
8/18/2016	12B	Org	1,2-Dichloroethane	<	5		
8/18/2016	12B	Org	1,4-Dichlorobenzene	<	6		
8/18/2016	12B	Org	Acetone	<	4		
8/18/2016	12B	Org	Benzene	<	1		
8/18/2016	12B	Org	Carbon Tetrachloride	<	6		
8/18/2016	12B	Org	Chlorobenzene	<	5		
8/18/2016	12B	Org	Chloroform	<	6		
8/18/2016	12B	Org	Cumene	<	3		
8/18/2016	12B	Org	Ethanol	<	10		
8/18/2016	12B	Org	Ethylbenzene	<	3		
8/18/2016	12B	Org	Methyl Ethyl Ketone	<	3		
8/18/2016	12B	Org	Methylene Chloride	<	7		
8/18/2016	12B	Org	o-Xylene	<	3		
8/18/2016	12B	Org	Pentane	<	2		
8/18/2016	12B	Org	p-Xylene	<	3		
8/18/2016	12B	Org	Styrene	<	5		
8/18/2016	12B	Org	Tetrachloroethene	<	6		
8/18/2016	12B	Org	Tetrahydrofuran	<	3		
8/18/2016	12B	Org	Toluene	<	3		
8/18/2016	12B	Org	Trichloroethylene	<	5		
8/18/2016	12B	Si	Cristobalite	<	5		
8/18/2016	12B	Si	Quartz	<	5		
8/18/2016	12B	SO	Sulfur Dioxide	<	3		
8/18/2016	12B	TCTF	1,1,2-Trichlorotrifluoroethane	<	10		
8/18/2016	12B	TCTF	Dichlorodifluoromethane	<	10		
8/23/2016	13	ACE	Acetonitrile		380		11
8/23/2016	13	ACR	Acrylonitrile	<	4	<	0.13
8/23/2016	13	DMAA	Dimethylacetamide	<	4	<	0.18
8/23/2016	13	DMAA	Dimethylformamide	<	10	<	0.4
8/23/2016	13	EO	Ethylene Oxide	<	2	<	0.058
8/23/2016	13	FMH	Formaldehyde		0.39		0.019
8/23/2016	13	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00057
8/23/2016	13	MET	Methanol	<	10	<	0.88
8/23/2016	13	MTL	Copper	<	1	<	0.00071

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/23/2016	13	MTL	Lead	<	1	<	0.00071
8/23/2016	13	MTL	Potassium	<	10	<	0.0071
8/23/2016	13	MTL	Sodium	<	10	<	0.0071
8/23/2016	13	NH3	Ammonia	<	10	<	0.36
8/23/2016	13	ORG	1,1,1-Trichloroethane	<	5	<	0.23
8/23/2016	13	ORG	1,1-Dichloroethane	<	5	<	0.22
8/23/2016	13	ORG	1,2,4-Trichlorobenzene	<	6	<	0.35
8/23/2016	13	ORG	1,2,4-Trimethylbenzene	<	3	<	0.16
8/23/2016	13	ORG	1,2-Dichlorobenzene	<	6	<	0.31
8/23/2016	13	ORG	1,2-Dichloroethane	<	5	<	0.22
8/23/2016	13	ORG	1,4-Dichlorobenzene	<	6	<	0.31
8/23/2016	13	ORG	Acetone	<	4	<	0.14
8/23/2016	13	ORG	Benzene	<	1	<	0.04
8/23/2016	13	ORG	Carbon Tetrachloride	<	6	<	0.28
8/23/2016	13	ORG	Chlorobenzene	<	5	<	0.24
8/23/2016	13	ORG	Chloroform	<	6	<	0.26
8/23/2016	13	ORG	Cumene	<	3	<	0.17
8/23/2016	13	ORG	Ethanol	<	10	<	0.33
8/23/2016	13	ORG	Ethylbenzene	<	3	<	0.16
8/23/2016	13	ORG	Methyl Ethyl Ketone	<	3	<	0.12
8/23/2016	13	ORG	Methylene Chloride	<	7	<	0.26
8/23/2016	13	ORG	o-Xylene	<	3	<	0.16
8/23/2016	13	ORG	Pentane	<	2	<	0.081
8/23/2016	13	ORG	p-Xylene	<	3	<	0.16
8/23/2016	13	ORG	Styrene	<	5	<	0.25
8/23/2016	13	ORG	Tetrachloroethene	<	6	<	0.3
8/23/2016	13	ORG	Tetrahydrofuran	<	3	<	0.12
8/23/2016	13	ORG	Toluene	<	3	<	0.14
8/23/2016	13	ORG	Trichloroethylene	<	5	<	0.23
8/23/2016	13	RP	Particulate, Respirable	<	50	<	0.025
8/23/2016	13	SI	Cristobalite	<	5	<	0.0029
8/23/2016	13	SI	Quartz	<	5	<	0.0029
8/23/2016	13	SO	Sulfur Dioxide		4		
8/23/2016	13	TCTF	1,1,2-Trichlorotrifluoroethane	<	10	<	0.45
8/23/2016	13	TCTF	Dichlorodifluoromethane		240		9.4
8/24/2016	14	RP	Particulate, Respirable	<	50	<	0.028
8/25/2016	14	ACE	Acetonitrile		160		4.5
8/25/2016	14	DMAA	Dimethylacetamide	<	4	<	0.17

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/25/2016	14	DMAA	Dimethylformamide	<	10	<	0.39
8/25/2016	14	FMH	Formaldehyde		0.39		0.019
8/25/2016	14	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00056
8/25/2016	14	MET	Methanol	<	10	<	0.86
8/25/2016	14	MTL	Copper	<	1	<	0.0007
8/25/2016	14	MTL	Lead	<	1	<	0.0007
8/25/2016	14	MTL	Potassium	<	10	<	0.007
8/25/2016	14	MTL	Sodium	<	10	<	0.007
8/25/2016	14	NH3	Ammonia	<	10	<	0.35
8/25/2016	14	ORG	1,1,1-Trichloroethane	<	5	<	0.23
8/25/2016	14	ORG	1,1-Dichloroethane	<	5	<	0.21
8/25/2016	14	ORG	1,2,4-Trichlorobenzene	<	6	<	0.34
8/25/2016	14	ORG	1,2,4-Trimethylbenzene	<	3	<	0.16
8/25/2016	14	ORG	1,2-Dichlorobenzene	<	6	<	0.3
8/25/2016	14	ORG	1,2-Dichloroethane	<	5	<	0.21
8/25/2016	14	ORG	1,4-Dichlorobenzene	<	6	<	0.3
8/25/2016	14	ORG	Acetone	<	4	<	0.14
8/25/2016	14	ORG	Benzene	<	1	<	0.039
8/25/2016	14	ORG	Carbon Tetrachloride	<	6	<	0.28
8/25/2016	14	ORG	Chlorobenzene	<	5	<	0.24
8/25/2016	14	ORG	Chloroform	<	6	<	0.25
8/25/2016	14	ORG	Cumene	<	3	<	0.17
8/25/2016	14	ORG	Ethanol	<	10	<	0.32
8/25/2016	14	ORG	Ethylbenzene	<	3	<	0.15
8/25/2016	14	ORG	Methyl Ethyl Ketone	<	3	<	0.12
8/25/2016	14	ORG	Methylene Chloride	<	7	<	0.26
8/25/2016	14	ORG	o-Xylene	<	3	<	0.15
8/25/2016	14	ORG	Pentane	<	2	<	0.079
8/25/2016	14	ORG	p-Xylene	<	3	<	0.15
8/25/2016	14	ORG	Styrene	<	5	<	0.24
8/25/2016	14	ORG	Tetrachloroethene	<	6	<	0.3
8/25/2016	14	ORG	Tetrahydrofuran	<	3	<	0.11
8/25/2016	14	ORG	Toluene	<	3	<	0.13
8/25/2016	14	ORG	Trichloroethylene	<	5	<	0.22
8/25/2016	14	SI	Cristobalite	<	5	<	0.0028
8/25/2016	14	SI	Quartz	<	5	<	0.0028
8/25/2016	14	TCTF	1,1,2-Trichlorotrifluoroethane	<	10	<	0.45
8/25/2016	14	TCTF	Dichlorodifluoromethane	<	10	<	0.38

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/25/2016	15B	ACE	Acetonitrile		100		
8/25/2016	15B	ACR	Acrylonitrile	<	4		
8/25/2016	15B	DMAA	Dimethylacetamide	<	4		
8/25/2016	15B	DMAA	Dimethylformamide	<	10		
8/25/2016	15B	EO	Ethylene Oxide	<	2		
8/25/2016	15B	FMH	Formaldehyde	<	0.1		
8/25/2016	15B	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4		
8/25/2016	15B	MET	Methanol	<	10		
8/25/2016	15B	MTL	Copper	<	1		
8/25/2016	15B	MTL	Lead	<	1		
8/25/2016	15B	MTL	Potassium	<	10		
8/25/2016	15B	MTL	Sodium	<	10		
8/25/2016	15B	NH3	Ammonia	<	10		
8/25/2016	15B	ORG	1,1,1-Trichloroethane	<	5		
8/25/2016	15B	ORG	1,1-Dichloroethane	<	5		
8/25/2016	15B	ORG	1,2,4-Trichlorobenzene	<	6		
8/25/2016	15B	ORG	1,2,4-Trimethylbenzene	<	3		
8/25/2016	15B	ORG	1,2-Dichlorobenzene	<	6		
8/25/2016	15B	ORG	1,2-Dichloroethane	<	5		
8/25/2016	15B	ORG	1,4-Dichlorobenzene	<	6		
8/25/2016	15B	ORG	Acetone	<	4		
8/25/2016	15B	ORG	Benzene	<	1		
8/25/2016	15B	ORG	Carbon Tetrachloride	<	6		
8/25/2016	15B	ORG	Chlorobenzene	<	5		
8/25/2016	15B	ORG	Chloroform	<	6		
8/25/2016	15B	ORG	Cumene	<	3		
8/25/2016	15B	ORG	Ethanol	<	10		
8/25/2016	15B	ORG	Ethylbenzene	<	3		
8/25/2016	15B	ORG	Methyl Ethyl Ketone	<	3		
8/25/2016	15B	ORG	Methylene Chloride	<	7		
8/25/2016	15B	ORG	o-Xylene	<	3		
8/25/2016	15B	ORG	Pentane	<	2		
8/25/2016	15B	ORG	p-Xylene	<	3		
8/25/2016	15B	ORG	Styrene	<	5		
8/25/2016	15B	ORG	Tetrachloroethene	<	6		
8/25/2016	15B	ORG	Tetrahydrofuran	<	3		
8/25/2016	15B	ORG	Toluene	<	3		
8/25/2016	15B	ORG	Trichloroethylene	<	5		

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/25/2016	15B	RP	Particulate, Respirable	<	50		
8/25/2016	15B	SI	Cristobalite	<	5		
8/25/2016	15B	SI	Quartz	<	5		
8/25/2016	15B	SO	Sulfur Dioxide	<	3		
8/25/2016	15B	TCTF	1,1,2-Trichlorotrifluoroethane	<	10		
8/25/2016	15B	TCTF	Dichlorodifluoromethane	<	10		
8/30/2016	16	ACR	Acrylonitrile	<	4	<	0.13
8/30/2016	16	DMAA	Dimethylacetamide	<	4	<	0.17
8/30/2016	16	DMAA	Dimethylformamide	<	10	<	0.39
8/30/2016	16	EO	Ethylene Oxide	<	2	<	0.056
8/30/2016	16	EPI	Epichlorohydrin	<	5	<	0.23
8/30/2016	16	FMH	Formaldehyde		0.35		0.017
8/30/2016	16	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4	<	0.00055
8/30/2016	16	MET	Methanol	<	10	<	0.85
8/30/2016	16	MTL	Copper	<	1	<	0.00067
8/30/2016	16	MTL	Lead	<	1	<	0.00067
8/30/2016	16	MTL	Potassium	<	10	<	0.0067
8/30/2016	16	MTL	Sodium	<	10	<	0.0067
8/30/2016	16	NH3	Ammonia	<	10	<	0.35
8/30/2016	16	ORG	1,1,1-Trichloroethane	<	5	<	0.22
8/30/2016	16	ORG	1,1-Dichloroethane	<	5	<	0.21
8/30/2016	16	ORG	1,2,4-Trichlorobenzene	<	6	<	0.33
8/30/2016	16	ORG	1,2,4-Trimethylbenzene	<	3	<	0.16
8/30/2016	16	ORG	1,2-Dichlorobenzene	<	6	<	0.3
8/30/2016	16	ORG	1,2-Dichloroethane	<	5	<	0.21
8/30/2016	16	ORG	1,4-Dichlorobenzene	<	6	<	0.3
8/30/2016	16	ORG	Acetone	<	4	<	0.14
8/30/2016	16	ORG	Benzene	<	1	<	0.039
8/30/2016	16	ORG	Carbon Tetrachloride		18		0.81
8/30/2016	16	ORG	Chlorobenzene	<	5	<	0.24
8/30/2016	16	ORG	Chloroform	<	6	<	0.25
8/30/2016	16	ORG	Cumene	<	3	<	0.17
8/30/2016	16	ORG	Ethanol	<	10	<	0.32
8/30/2016	16	ORG	Ethylbenzene	<	3	<	0.15
8/30/2016	16	ORG	Methyl Ethyl Ketone	<	3	<	0.11
8/30/2016	16	ORG	Methylene Chloride	<	7	<	0.26
8/30/2016	16	ORG	o-Xylene	<	3	<	0.15
8/30/2016	16	ORG	Pentane	<	2	<	0.078

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
8/30/2016	16	ORG	p-Xylene	<	3	<	0.15
8/30/2016	16	ORG	Styrene	<	5	<	0.24
8/30/2016	16	ORG	Tetrachloroethene	<	6	<	0.29
8/30/2016	16	ORG	Tetrahydrofuran	<	3	<	0.11
8/30/2016	16	ORG	Toluene	<	3	<	0.13
8/30/2016	16	ORG	Trichloroethylene	<	5	<	0.22
8/30/2016	16	RP	Particulate, Respirable		50		0.027
8/30/2016	16	Si	Cristobalite	<	5	<	0.0027
8/30/2016	16	Si	Quartz	<	5	<	0.0027
8/30/2016	16	SO	Sulfur Dioxide	<	3	<	0.27
8/30/2016	16	TCTF	1,1,2-Trichlorotrifluoroethane	<	10	<	0.44
8/30/2016	16	TCTF	Dichlorodifluoromethane		250		9.3
9/1/2016	17	ACE	Acetonitrile	<	4	<	0.11
9/1/2016	17	ACR	Acrylonitrile	<	4	<	0.13
9/1/2016	17	DMAA	Dimethylacetamide	<	4	<	0.17
9/1/2016	17	DMAA	Dimethylformamide	<	10	<	0.39
9/1/2016	17	EO	Ethylene Oxide	<	2	<	0.056
9/1/2016	17	EPI	Epichlorohydrin	<	5	<	0.23
9/1/2016	17	FMH	Formaldehyde		0.2		0.0094
9/1/2016	17	MET	Methanol	<	10	<	0.85
9/1/2016	17	MTL	Copper	<	1	<	0.00068
9/1/2016	17	MTL	Lead	<	1	<	0.00068
9/1/2016	17	MTL	Potassium	<	10	<	0.0068
9/1/2016	17	MTL	Sodium	<	10	<	0.0068
9/1/2016	17	NH3	Ammonia	<	10	<	0.34
9/1/2016	17	ORG	1,1,1-Trichloroethane	<	5	<	0.22
9/1/2016	17	ORG	1,1-Dichloroethane	<	5	<	0.21
9/1/2016	17	ORG	1,2,4-Trichlorobenzene	<	6	<	0.33
9/1/2016	17	ORG	1,2,4-Trimethylbenzene	<	3	<	0.16
9/1/2016	17	ORG	1,2-Dichlorobenzene	<	6	<	0.3
9/1/2016	17	ORG	1,2-Dichloroethane	<	5	<	0.21
9/1/2016	17	ORG	1,4-Dichlorobenzene	<	6	<	0.3
9/1/2016	17	ORG	Acetone	<	4	<	0.14
9/1/2016	17	ORG	Benzene	<	1	<	0.039
9/1/2016	17	ORG	Carbon Tetrachloride	<	6	<	0.27
9/1/2016	17	ORG	Chlorobenzene	<	5	<	0.23
9/1/2016	17	ORG	Chloroform	<	6	<	0.25
9/1/2016	17	ORG	Cumene	<	3	<	0.17

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
9/1/2016	17	ORG	Ethanol	<	10	<	0.31
9/1/2016	17	ORG	Ethylbenzene	<	3	<	0.15
9/1/2016	17	ORG	Methyl Ethyl Ketone	<	3	<	0.11
9/1/2016	17	ORG	Methylene Chloride	<	7	<	0.25
9/1/2016	17	ORG	o-Xylene	<	3	<	0.15
9/1/2016	17	ORG	Pentane	<	2	<	0.078
9/1/2016	17	ORG	p-Xylene	<	3	<	0.15
9/1/2016	17	ORG	Styrene	<	5	<	0.24
9/1/2016	17	ORG	Tetrachloroethene	<	6	<	0.29
9/1/2016	17	ORG	Tetrahydrofuran	<	3	<	0.11
9/1/2016	17	ORG	Toluene	<	3	<	0.13
9/1/2016	17	ORG	Trichloroethylene	<	5	<	0.22
9/1/2016	17	RP	Particulate, Respirable		50		0.027
9/1/2016	17	Si	Cristobalite	<	5	<	0.0029
9/1/2016	17	Si	Quartz	<	5	<	0.0029
9/1/2016	17	SO	Sulfur Dioxide	<	3	<	0.27
9/1/2016	17	TCTF	1,1,2-Trichlorotrifluoroethane	<	10	<	0.44
9/1/2016	17	TCTF	Dichlorodifluoromethane	<	10	<	0.38
9/1/2016	18B	ACE	Acetonitrile	<	4		
9/1/2016	18B	ACR	Acrylonitrile	<	4		
9/1/2016	18B	DMAA	Dimethylacetamide	<	4		
9/1/2016	18B	DMAA	Dimethylformamide	<	10		
9/1/2016	18B	EO	Ethylene Oxide	<	2		
9/1/2016	18B	EPI	Epichlorohydrin	<	5		
9/1/2016	18B	FMH	Formaldehyde	<	0.1		
9/1/2016	18B	ISO	Methylene -bis(4-cyclohexylisocyanate)	<	0.4		
9/1/2016	18B	MET	Methanol	<	10		
9/1/2016	18B	MTL	Copper	<	1		
9/1/2016	18B	MTL	Lead	<	1		
9/1/2016	18B	MTL	Potassium	<	10		
9/1/2016	18B	MTL	Sodium	<	10		
9/1/2016	18B	NH3	Ammonia	<	10		
9/1/2016	18B	ORG	1,1,1-Trichloroethane	<	5		
9/1/2016	18B	ORG	1,1-Dichloroethane	<	5		
9/1/2016	18B	ORG	1,2,4-Trichlorobenzene	<	6		
9/1/2016	18B	ORG	1,2,4-Trimethylbenzene	<	3		
9/1/2016	18B	ORG	1,2-Dichlorobenzene	<	6		
9/1/2016	18B	ORG	1,2-Dichloroethane	<	5		

Sample Date	Event	ID	Analyte	Results, µg		Results, mg/m^3	
9/1/2016	18B	ORG	1,4-Dichlorobenzene	<	6		
9/1/2016	18B	ORG	Acetone	<	4		
9/1/2016	18B	ORG	Benzene	<	1		
9/1/2016	18B	ORG	Carbon Tetrachloride	<	6		
9/1/2016	18B	ORG	Chlorobenzene	<	5		
9/1/2016	18B	ORG	Chloroform	<	6		
9/1/2016	18B	ORG	Cumene	<	3		
9/1/2016	18B	ORG	Ethanol	<	10		
9/1/2016	18B	ORG	Ethylbenzene	<	3		
9/1/2016	18B	ORG	Methyl Ethyl Ketone	<	3		
9/1/2016	18B	ORG	Methylene Chloride	<	7		
9/1/2016	18B	ORG	o-Xylene	<	3		
9/1/2016	18B	ORG	Pentane	<	2		
9/1/2016	18B	ORG	p-Xylene	<	3		
9/1/2016	18B	ORG	Styrene	<	5		
9/1/2016	18B	ORG	Tetrachloroethene	<	6		
9/1/2016	18B	ORG	Tetrahydrofuran	<	3		
9/1/2016	18B	ORG	Toluene	<	3		
9/1/2016	18B	ORG	Trichloroethylene	<	5		
9/1/2016	18B	RP	Particulate, Respirable	<	50		
9/1/2016	18B	Si	Cristobalite	<	5		
9/1/2016	18B	Si	Quartz	<	5		
9/1/2016	18B	SO	Sulfur Dioxide	<	3		
9/1/2016	18B	TCTF	1,1,2-Trichlorotrifluoroethane	<	10		
9/1/2016	18B	TCTF	Dichlorodifluoromethane	<	10		

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