

# MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

## INTEROFFICE COMMUNICATION

TO: File

FROM: Susan Kilmer

DATE: February 27, 2020

SUBJECT: Monthly Ethylene Oxide Sampling at Viant Medical, Inc. for November and December 2019

### Overview

Viant Medical, Inc. (Viant) in Grand Rapids, Michigan was identified by the United States Environmental Protection Agency (USEPA) National Air Toxics Assessment (NATA) as having elevated ethylene oxide ambient air impacts. Subsequent computer modeling by the Air Quality Division (AQD) showed impacts above the Initial Risk Screening Level (IRSL) at  $0.0002 \mu\text{g}/\text{m}^3$  and Secondary Risk Screening Level (SRSL) at  $0.002 \mu\text{g}/\text{m}^3$ . To ascertain the accuracy of the computer model, the AQD initially conducted a [Phase I](#) (limited monitoring) sampling study for ethylene oxide in the vicinity of Viant in November 2018. A more robust [Phase II](#) sampling effort was conducted in March 2019 near the facility, on the Grand Valley State University campus, locations in the City of Grand Rapids, and several upwind and downwind locations.

As part of a compliance plan related to an enforcement action, Viant has agreed to conduct monthly perimeter sampling for ethylene oxide. Viant contracted with Ramboll US Corporation (Ramboll) to conduct ambient air sampling at four outdoor locations as well as one indoor location on a once per month basis. The monthly sampling began in July 2019 and will continue through February 2020. The AQD began collecting a side by side outdoor air sample with Viant at one location starting in August 2019 and will continue through February 2020. The EPA has established criteria for comparing data from different laboratories. If values from two different laboratories are within  $\pm 20\%$ , then the laboratories have good comparability. Results of all sampling events are available on the website [www.michigan.gov/viant](http://www.michigan.gov/viant)

### Sampling Details

Ambient air monitoring for ethylene oxide was accomplished using the EPA TO-15 Summa canister method. The EPA's National Contract Laboratory, Eastern Research Group (ERG), performed the analysis. ERG's laboratory detection limit is  $0.025 \mu\text{g}/\text{m}^3$ . Since the SRSL is lower than the detection limit of the current method for ethylene oxide, the monitoring data will have to be carefully interpreted. For example, if a sample result is reported as non-detect, it is possible that the actual level could still be above the SRSL.

## Results

Ramboll collected five samples over a 24-hour period on November 20, 2019 and December 12, 2019 as well as a duplicate canister at one location each month. The AQD received the Viant results in December 2019 and January 2020 respectively. The results from the November sampling are on page 2 of the report named "Ambient Air Sampling at Viant Medical Facility, Grand Rapids, Michigan November 2019 Sampling Events Results" (Viant Report) and likewise on page 2 of the December Viant Report. The results from the AQD canister collected in November are on page 3 and the December sample is on page 4 of the ERG lab report.

The results of the November samples collected by Ramboll and the AQD are similar to the results observed during the AQD's Phase I and II sampling events in the greater Grand Rapids community. The AQD canister was located at site #4 with two Ramboll canisters. The AQD canister result was  $0.22 \mu\text{g}/\text{m}^3$  whereas the Ramboll canisters were  $0.13$  and  $0.14 \mu\text{g}/\text{m}^3$ . This difference is greater than the EPA recommended  $\pm 20\%$  criteria. The reason for the difference has not yet been determined. The wind direction on the November sample day was from the southwest, blowing to the northeast. No samples were collected on the northeast side of the facility.

The results of the December samples collected by Ramboll and the AQD are similar to the AQD's Phase I and II sample results at three of the four locations. However, the December results at site #4, on the north side of the facility, were higher than the other three locations. The wind direction on the December sample day was from the south, blowing to the north and therefore site #4 was directly downwind. The results of the Ramboll canisters were  $0.54$  and  $0.60 \mu\text{g}/\text{m}^3$  and the AQD canister result was  $0.51 \mu\text{g}/\text{m}^3$  which demonstrated good comparability in adherences to the EPA recommended  $\pm 20\%$  criteria.



Eastern Research Group  
601 Keystone Park Drive  
Suite 700  
Morrisville, NC 27560

January 07, 2020

Ms. Amy Robinson  
U.S. Environmental Protection Agency, Region 5  
PO Box 30260  
Lansing, MI 48909  
Project Name: Viant EtO

Dear Ms. Amy Robinson,

This report contains the analytical results for the sample(s) received under chain(s) of custody by Eastern Research Group on 11/21/19 12:26 through 12/16/19 10:04.

The test results in this report are in compliance with NELAC accreditation requirements for the certified parameters. All analyses were performed as described in the US EPA-approved QAPP, under the contract for UATMP, NATTS, CSATAM, PAMS and NMOC support (US EPA Contract No. EP-D-14-030). This cover page is an integral part of this report, and any exceptions or comments are noted on the last page.

Release of the data contained in this data package and in the data submitted in the electronic data deliverable, has been authorized by the Program Manager, or the Program Manager's designee as verified by the following signature.

The issuance of the final Certificate of Analysis takes precedence over any previous Report. If you have any questions, please contact me at 919-468-7924.

Sincerely,

Julie Swift  
Program Manager  
[julie.swift@erg.com](mailto:julie.swift@erg.com)

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## CERTIFICATE OF ANALYSIS

U.S. Environmental Protection Agency, Region 5

PO Box 30260

Lansing, MI 48909

**ATTN:** Ms. Amy Robinson

**PHONE:** (517) 241-2198 **FAX:** (312) 886-5824

**FILE #:** 4173.00

**REPORTED:** 01/07/20 14:57

**SUBMITTED:** 11/21/19 to 12/16/19

**AQS SITE CODE:**

**SITE CODE:** Viant EtO

### ANALYTICAL REPORT FOR SAMPLES

| <u>SampleName</u> | <u>LabNumber</u> | <u>Matrix</u> | <u>Sampled</u> | <u>Received</u> |
|-------------------|------------------|---------------|----------------|-----------------|
| Viant             | 9112109-01       | Air           | 11/20/19 11:26 | 11/21/19 12:26  |
| Viant             | 9121615-01       | Air           | 12/12/19 23:25 | 12/16/19 10:04  |



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FILE #: 4173.00

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SUBMITTED: 11/21/19 to 12/16/19

AQS SITE CODE:

SITE CODE: Viant EtO

Description: Viant

Lab ID: 9112109-01

Sampled: 11/20/19 11:26

Pressure @ Receipt: 0" Hg

Canister #: AZ53

Received: 11/21/19 12:26

Comments:

Analyzed: 11/27/19 01:58

### Air Toxics by EPA Compendium Method TO-15

| <u>Analyte</u> | <u>Results</u> |                         | <u>Flag</u> | <u>MDL</u>  |
|----------------|----------------|-------------------------|-------------|-------------|
|                | <u>ppbv</u>    | <u>ug/m<sup>3</sup></u> |             | <u>ppbv</u> |
| Ethylene oxide | 0.124          | 0.22                    |             | 0.0250      |



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FILE #: 4173.00

REPORTED: 01/07/20 14:57

SUBMITTED: 11/21/19 to 12/16/19

AQS SITE CODE:

SITE CODE: Viant EtO

Description: Viant

Lab ID: 9121615-01

Sampled: 12/12/19 23:25

Pressure @ Receipt: 0" Hg

Canister #: 19664

Received: 12/16/19 10:04

Comments:

Analyzed: 12/20/19 06:58

### Air Toxics by EPA Compendium Method TO-15

| <u>Analyte</u> | <u>Results</u> |                         | <u>Flag</u> | <u>MDL</u>  |
|----------------|----------------|-------------------------|-------------|-------------|
|                | <u>ppbv</u>    | <u>ug/m<sup>3</sup></u> |             | <u>ppbv</u> |
| Ethylene oxide | 0.280          | 0.51                    |             | 0.0250      |



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**REPORTED:** 01/07/20 14:57

**SUBMITTED:** 11/21/19 to 12/16/19

**AQS SITE CODE:**

**SITE CODE:** Viant EtO

| Analyte | Result | Units | Source<br>Result | RPD | RPD<br>Limit | Notes |
|---------|--------|-------|------------------|-----|--------------|-------|
|---------|--------|-------|------------------|-----|--------------|-------|

### Air Toxics by EPA Compendium Method TO-15 - Quality Control

*Batch B9K2605 - Summa Canister Prep*

**Blank (B9K2605-BLK1)**

Prepared: 11/18/19 Analyzed: 11/26/19

|                |    |      |  |  |  |   |
|----------------|----|------|--|--|--|---|
| Ethylene oxide | ND | ppbv |  |  |  | U |
|----------------|----|------|--|--|--|---|

*Batch B9L1707 - Summa Canister Prep*

**Blank (B9L1707-BLK1)**

Prepared: 12/17/19 Analyzed: 12/19/19

|                |    |      |  |  |  |   |
|----------------|----|------|--|--|--|---|
| Ethylene oxide | ND | ppbv |  |  |  | U |
|----------------|----|------|--|--|--|---|



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**SUBMITTED:** 11/21/19 to 12/16/19

**AQS SITE CODE:**

**SITE CODE:** Viant EtO

| Analyte | Result | Units | % Difference | Limit (%) | Notes |
|---------|--------|-------|--------------|-----------|-------|
|---------|--------|-------|--------------|-----------|-------|

### Air Toxics by EPA Compendium Method TO-15 - Quality Control

#### *Sequence 1911058*

##### **Calibration Check (1911058-CCV1)**

Prepared & Analyzed: 11/26/19

|                |      |      |     |       |
|----------------|------|------|-----|-------|
| Ethylene oxide | 2.75 | ppbv | 9.9 | 30.00 |
|----------------|------|------|-----|-------|

#### *Sequence 1912038*

##### **Calibration Check (1912038-CCV1)**

Prepared: 12/17/19 Analyzed: 12/19/19

|                |      |      |     |       |
|----------------|------|------|-----|-------|
| Ethylene oxide | 2.51 | ppbv | 0.5 | 30.00 |
|----------------|------|------|-----|-------|





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**FILE #:** 4173.00

**REPORTED:** 01/07/20 14:57

**SUBMITTED:** 11/21/19 to 12/16/19

**AQS SITE CODE:**

**SITE CODE:** Viant EtO

### Notes and Definitions

|     |                             |
|-----|-----------------------------|
| U   | Under Detection Limit       |
| ND  | Analyte NOT DETECTED        |
| NR  | Not Reported                |
| MDL | Method Detection Limit      |
| RPD | Relative Percent Difference |

Note: The test results meet all requirements of NELAC; however the following analytes are not accredited: 1,2,4-trimethylbenzene, 1,2-dibromoethane, 1,2-dichloropropane, 1,3,5-trimethylbenzene, 1,3-butadiene, acetylene, acrolein, bromochloromethane, bromodichloromethane, bromoform, carbon disulfide, dibromochloromethane, dichlorodifluoromethane, dichlorotetrafluoroethane, ethyl acrylate, ethyl tert butyl ether, ethylene oxide, hexachloro-1,3-butadiene, n-octane, propylene, tert amyl methyl ether, tetrachloroethylene, trans-1,2-dichloroethylene, trichlorofluoromethane, and trichlorotrifluoroethane.

AMBIENT AIR SAMPLING AT VIAN T MEDICAL  
FACILITY, GRAND RAPIDS, MICHIGAN  
NOVEMBER 2019 SAMPLING EVENT RESULTS

Prepared For:  
Hogan Lovells US LLP  
Denver, CO

On Behalf Of:  
Viant Medical  
Grand Rapids, MI

Prepared By:  
Ramboll US Corporation  
Arlington, VA

Date  
December 2019

Project Number  
1690010876

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Appendix A: Air Sampling Program Results Summary

Appendix B: Photographs of Sampling Locations

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## 1. INTRODUCTION

Ramboll US Corporation (Ramboll) has prepared this report to summarize the sampling procedures and results of Ramboll's November 2019 air sampling event at the Viant Medical (Viant) facility located at 520 Watson Street Southwest in Grand Rapids, Michigan (the "facility" or the "site"). The sampling event was completed during a 24-hour period between November 19 and 20, 2019, and included the collection of five outdoor ambient air samples<sup>1</sup> and one indoor air (IA) sample, which were submitted for laboratory analysis of ethylene oxide (EtO). The sampling was performed in accordance with the scope of work outlined in the April 2019 Ambient Air Sampling Work Plan (the "April 2019 Work Plan") prepared by Ramboll. The sections below describe the sampling methodology and results from the November 2019 sampling event.

## 2. SAMPLING LOCATIONS

The five sampling locations selected during this event were the same locations sampled by Ramboll during previous events. Location #4 was selected for the placement of co-located samples, resulting in the collection of six samples in total. Sampling locations are depicted on Figure 1 and photographs of each sample are included in Appendix B.

## 3. METHODOLOGY

All six samples were collected using individually certified 6-liter stainless steel SUMMA® canisters equipped with individually certified 24-hour mass flow controllers provided by Eurofins Air Toxics (EAT). The canisters were secured to the same fixtures that were used during previous sampling events for sample collection within the breathing zone (approximately 5-6 feet). The co-located canister inlets at Location #4 were approximately 2 feet<sup>2</sup> away from each other.

Prior to sample collection at each location, a shut-in test was performed on each canister and mass flow controller using the methods described in the initial July 2019 sampling report. After the successful completion of each shut-in test, the valve on the canister was opened to begin collection of the 24-hour integrated sample. The recordkeeping and canister pressure monitoring methods used in the field during this event are the same as those described previously. The winds primarily blew from the southwest during the 24-hour sampling period, which began November 19, 2019 and ended November 20, 2019.

After approximately 24 hours from the start of the event, the valves on the canisters were closed, final field measurements were recorded, and samples were shipped overnight to EAT in Folsom, California for analysis of EtO using the methods specified in the April 2019 Work Plan. The laboratory received the canisters on November 21, 2019 and analyzed the samples on November 25 and 26, 2019.

Additionally, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) collected one canister sample at Location #4 in the same 24-hour time period as Ramboll's samples. EGLE's

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<sup>1</sup> One of the samples was a co-located sample.

<sup>2</sup> Because of the diameter of the utility pole used to secure the canisters at Location #4, the canister inlets were placed two feet from each other.

canister was sent to a different contract laboratory for analysis and will be discussed separately by EGLE.

## 4. RESULTS

The results from the November 2019 Ramboll sampling event are reported in Tables 1 and 2.

| Table 1: Outdoor Air Sampling Results, November 19-20, 2019                 |         |   |  |  |
|---|---------|---|--|--|
| Sample Location ID  | On-Site | Location Description                                | EtO Concentration ( $\mu\text{g}/\text{m}^3$ ) | Sample-Specific MDL ( $\mu\text{g}/\text{m}^3$ ) |
| 1   | Yes     | South of building in parking lot                    | 0.14 J   | 0.043  |
| 2   | Yes     | West of building, along western property boundary   | 0.15 J   | 0.054  |
| 3   | No      | Northwest of building along Watson Street Southwest | 0.11 J   | 0.045  |
| 4 (co-located samples)  | Yes     | North of building, northern corner of parking lot   | 0.14;<br>0.13 J (co-located sample)            | 0.039;<br>0.045                                  |
| J = Laboratory-estimated value below the Reporting Limit but above the MDL. |         |   |  |  |

| Table 2: Indoor Air Sampling Results, November 19-20, 2019 |                      |  |  |
|--|----------------------|--|--|
| Sample Location ID   | Location Description | EtO Concentration ( $\mu\text{g}/\text{m}^3$ ) | Sample-Specific MDL ( $\mu\text{g}/\text{m}^3$ ) |
| IA   | Scrubber room        | 580  | 0.12   |

EtO was detected in all samples collected during the November 2019 event. The EtO concentration in outdoor ambient air samples ranged from 0.11 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) at Location #3 to 0.15  $\mu\text{g}/\text{m}^3$  at Location #2 (Figure 1). All but one of the concentrations were reported at or below the laboratory reporting limit, and therefore laboratory-estimated values are provided. EGLE provided meteorological data collected in five-minute intervals from its Grand Rapids – Monroe Street air monitoring site, which is approximately 1.7 miles north-northeast of Viant.<sup>3</sup> As evident from a wind rose prepared using the meteorological data (Figure 2), winds were generally blowing from the southwest during the sampling event. Wind speeds varied between 0 and 8 miles per hour (mph). The EtO concentration inside the scrubber room was 580  $\mu\text{g}/\text{m}^3$ . A summary of results from this and prior Ramboll sampling events is provided in Appendix A.

<sup>3</sup> The Grand Rapids – Monroe Street air monitoring site is part of the state's air monitoring network as well as the federal NCore multipollutant monitoring network. Meteorological measurements collected at the site are subject to quality assurance procedures in the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV: Meteorological Measurements Version 2.0.

## 5. QUALITY ASSURANCE

Ramboll evaluated data quality based on acceptance criteria specified by the United States Environmental Protection Agency (USEPA) for precision, completeness, bias, and sensitivity in accordance with the April 2019 Work Plan. To evaluate the repeatability of sampling procedures, one co-located sample was collected at Location #4 during this investigation. The difference in concentrations of EtO detected in these co-located samples was 7.4% (using the calculated average detected concentration as the denominator) and within the acceptable range of 25%, as defined in the April 2019 Work Plan. Additionally, a daily laboratory control sample (LCS) and a laboratory control sample duplicate (LCSD) that contain a known concentration of EtO were analyzed to evaluate the repeatability of laboratory analytical methods. Their results are reported in terms of the percent of EtO recovered (i.e., detected) relative to the known concentration of EtO in the LCS and LCSD. The relative percent difference in detected concentrations of EtO was 1.6%, which also is in the acceptable range of within 25%. Given the sensitivity of the laboratory analytical method, the laboratory diluted the sample collected inside the scrubber room, which increased the Minimum Detection Limit (MDL) above the target MDL for this sample. A summary of all quality assurance criteria related to the November 2019 sampling event is provided in Table 3 below.

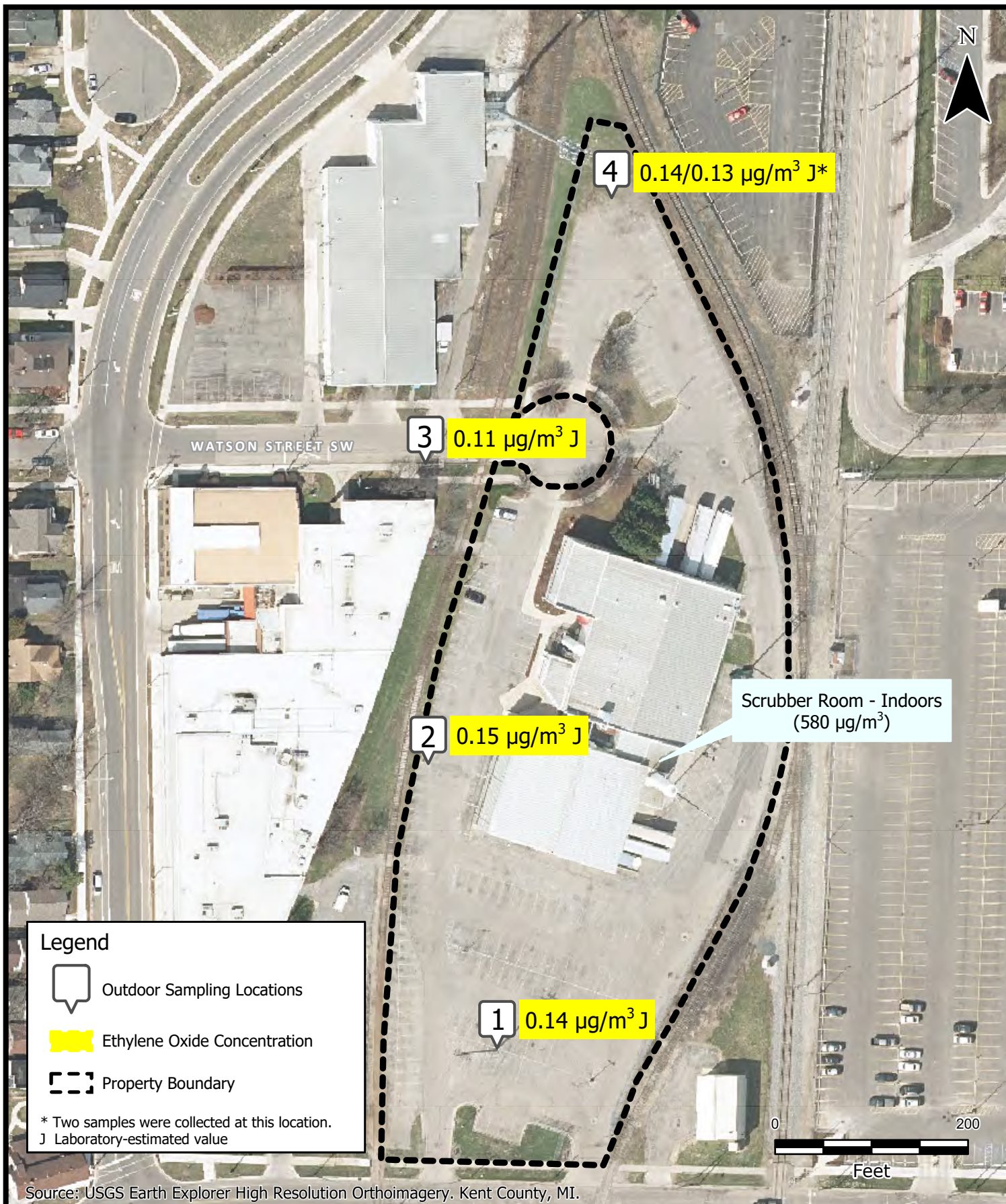
| Table 3: Quality Control Criteria for TO-15 Sample Collection and Analysis, November 19-20, 2019   |                                |   |  |  |                   |
|--|--------------------------------|---|--|--|-------------------|
| Quality Control Sample   | Data Quality Indicators (DQIs) | Frequency   | Acceptance Criteria  | November 2019 Outcome                            | Corrective Action |
| Co-located sample  | Precision                      | 1 per day   | Within 25%   | 7.4%   | N/A               |
| Replicate sample**   | Precision                      | 1 per batch   | Within 25% for sample concentrations greater than five times reporting limit | 1.6%   | N/A               |
| Valid sample count   | Completeness                   | N/A   | 85% or more of total samples   | 100% (100% for total sampling program)           | N/A               |
| Canister batch blank   | Bias                           | After analysis of standards and prior to sample analysis, or when contamination is present. | Below the reporting limit  | Below reporting limit of 0.090 µg/m <sup>3</sup> | N/A               |
| Method Detection Limit   | Sensitivity                    | 1 per method modification   | 0.05 ppb (0.09 µg/m <sup>3</sup> ) or less                                   | N/A* (no change to method)                       | N/A               |
| Sampling period  | Field QC                       | All samples   | 24 hours +/- 1 hour  | All samples                                      | N/A               |
| <p>*Sample-specific MDLs noted in Tables 1 and 2 may be affected by dilution.</p> <p>**Laboratory analysis of LCS and LCSD were used to evaluate precision of analytical methods during this sampling event.</p> |                                |   |  |  |                   |

## 6. CONCLUSIONS

EtO was detected at concentrations in ambient air surrounding the Viant facility at concentrations between  $0.11 \mu\text{g}/\text{m}^3$  and  $0.15 \mu\text{g}/\text{m}^3$  during the November 2019 sampling event. No correlation was apparent between sample concentrations and predominant wind direction, as was evident during monthly sampling events prior to October 2019.



FIGURE 1  
MAP OF SAMPLING RESULTS



**SAMPLING RESULTS (NOVEMBER 2019)**  
VIANT MEDICAL  
GRAND RAPIDS, MICHIGAN

**FIGURE**  
**1**

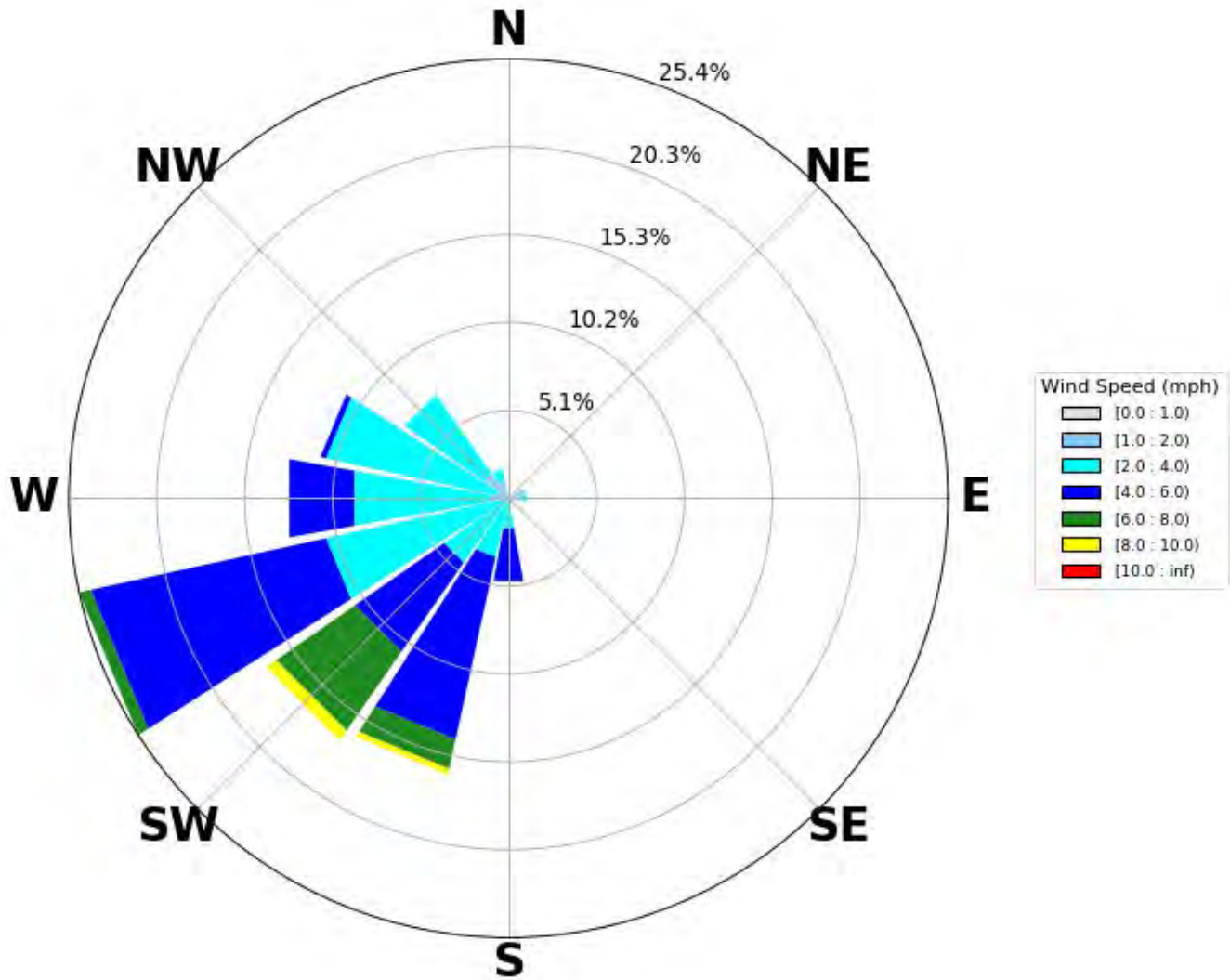
FIGURE 2  
WIND ROSE

WIND ROSE PLOT:

**EGLE Met Station - Grand Rapids, MI**  
Monroe Ave, south of Leonard St.

DISPLAY:

**Wind Speed**  
**Direction (blowing from)**



COMMENTS:

DATA PERIOD:

**Start Date:**  
**11/19/2019 - 11:35**

**End Date:**  
**11/20/2019 - 12:00**

CALM WINDS:

**2.4%**

AVG. WIND SPEED:

**3.38 mph**

## WIND ROSE FOR EGLE GRAND RAPIDS METEOROLOGICAL STATION

COMPANY NAME:

**Viant Medical**

DATE:

**12/6/2019**

DRAFTED BY:

**HA**

FIGURE  
2

**RAMBOLL**

APPENDIX A  
AIR SAMPLING PROGRAM RESULTS  
SUMMARY

Ethylene Oxide Concentrations ( $\mu\text{g}/\text{m}^3$ ) in Outdoor Air

| Sample Dates (24-Hour Period) | Predominant Wind Direction(s) During Event | Location ID and Description |                  |   |                            |
|-------------------------------|--|-----------------------------|------------------|---|----------------------------|
|                               |  | #1                          | #2               | #3  | #4                         |
|                               |  | South of Building           | West of Building | Northwest of Building (off-site along Watson Street SW) | North of Building          |
| 7/9/2019 - 7/10/2019          | SE   | 0.27                        | 0.77             | 0.98  | 1.8 (Note 1)               |
| 8/12/2019 - 8/13/2019         | W, NW, N, NE                               | 2.5                         | 0.22             | 0.21  | 0.28 / 0.28 <sup>c</sup>   |
| 9/10/2019 - 9/11/2019         | SW, S                                      | 0.38                        | 0.51             | 0.40  | 0.90 / 0.76 <sup>c</sup>   |
| 10/16/2019 - 10/17/2019       | NW   | 0.20 / 0.20 <sup>c</sup>    | 0.15 J           | 0.34  | 0.16                       |
| 11/19/2019 - 11/20/2019       | SW   | 0.14 J                      | 0.15 J           | 0.11 J  | 0.14 / 0.13 <sup>c</sup> J |

Notes:

/ = Quality control sampling data is separated by a slash (/)

<sup>c</sup> = Co-located sample

J = Laboratory-estimated value

Note 1 = Result represents an average concentration over a 21-hour period

Ethylene Oxide Concentrations ( $\mu\text{g}/\text{m}^3$ ) in Indoor Air

|                               | Location ID and Description |
|-------------------------------|-----------------------------|
| Sample Dates (24-Hour Period) | IA (Scrubber Room)          |
| 7/9/2019 - 7/10/2019          | 440 / 450 <sup>c</sup>      |
| 8/12/2019 - 8/13/2019         | 460                         |
| 9/10/2019 - 9/11/2019         | 710                         |
| 10/16/2019 - 10/17/2019       | 590                         |
| 11/19/2019 - 11/20/2019       | 580                         |

Notes:

/ = Quality control sampling data is separated by a slash (/)

<sup>c</sup> = Co-located sample

## APPENDIX B

### PHOTOGRAPHS OF SAMPLING LOCATIONS





Photo 1: View of sample collection at location #1, facing south.



Photo 2: View of sample collection at location #2, facing west.



## Site Photographs

Viant Medical  
520 Watson Street Southwest, Grand Rapids, Michigan  
November 2019





Photo 3: View of sample collection at location #3, facing east.



Photo 4: View of co-located sample collection at location #4, facing north. Sample collected by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) also pictured (center canister).



## Site Photographs

Viant Medical  
520 Watson Street Southwest, Grand Rapids, Michigan  
November 2019



Photo 5: View of sample collection at indoor air (IA) location within scrubber room.

## APPENDIX C LABORATORY ANALYTICAL REPORT



12/6/2019

Ms. Christine Ng

Ramboll

4350 N. Fairfax Drive

Suite 300

Arlington VA 22203

Project Name: Viant Medical-Grand Rapids

Project #: 1690010876

Workorder #: 1911474

Dear Ms. Christine Ng

The following report includes the data for the above referenced project for sample(s) received on 11/21/2019 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 SIM are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott

Project Manager

# WORK ORDER #: 1911474

## Work Order Summary

|                        |  |                  |   |
|------------------------|--|------------------|---|
| <b>CLIENT:</b>         | Ms. Christine Ng<br>Ramboll<br>4350 N. Fairfax Drive<br>Suite 300<br>Arlington, VA 22203 | <b>BILL TO:</b>  | Accounts Payable-Arlington VA<br>Ramboll<br>4350 N. Fairfax Drive<br>Suite 300<br>Arlington, VA 22203 |
| <b>PHONE:</b>          | 703-516-2382   | <b>P.O. #</b>    | WO-2019-ARL-01  |
| <b>FAX:</b>            | 703-516-2302   | <b>PROJECT #</b> | 1690010876 Viant Medical-Grand  |
| <b>DATE RECEIVED:</b>  | 11/21/2019   | <b>CONTACT:</b>  | Rapids<br>Ausha Scott   |
| <b>DATE COMPLETED:</b> | 12/04/2019   |                  |   |

| <u>FRACTION #</u> | <u>NAME</u>  | <u>TEST</u>        | <u>RECEIPT<br/>VAC./PRES.</u> | <u>FINAL<br/>PRESSURE</u> |
|-------------------|--------------|--------------------|-------------------------------|---------------------------|
| 01A               | 20191119-1   | Modified TO-15 SIM | 5.0 "Hg                       | 5 psi                     |
| 02A               | 20191119-2   | Modified TO-15 SIM | 10.0 "Hg                      | 5 psi                     |
| 03A               | 20191119-3   | Modified TO-15 SIM | 6.0 "Hg                       | 5 psi                     |
| 04A               | 20191119-4   | Modified TO-15 SIM | 2.0 "Hg                       | 5 psi                     |
| 05A               | 20191119-DUP | Modified TO-15 SIM | 6.0 "Hg                       | 5 psi                     |
| 06A               | 20191119-IA  | Modified TO-15 SIM | 7.0 "Hg                       | 5 psi                     |
| 07A               | Lab Blank    | Modified TO-15 SIM | NA                            | NA                        |
| 08A               | CCV          | Modified TO-15 SIM | NA                            | NA                        |
| 09A               | LCS          | Modified TO-15 SIM | NA                            | NA                        |
| 09AA              | LCSD         | Modified TO-15 SIM | NA                            | NA                        |

CERTIFIED BY:



Technical Director

DATE: 12/04/19

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

**LABORATORY NARRATIVE**  
**EPA TO-15 Ethylene oxide (SIM)**  
**Ramboll**  
**Workorder# 1911474**

Six 6 Liter Summa Canister (EO) samples were received on November 21, 2019. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the SIM acquisition mode for the measurement of Ethylene oxide in ambient air.

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

Ethylene Oxide is not included on the laboratory's NELAP scope of accreditation for TO-15 SIM. However, TO-15 method and NELAP quality requirements were met.

As per project specific client request the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. The canisters used for this project have been certified to the Reporting Limit for Ethylene Oxide. Concentrations that are below the level at which the canister was certified may be false positives.

Dilution was performed on sample 20191119-IA due to the presence of high level target species.

**Definition of Data Qualifying Flags**

Nine qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

CN - See Case Narrative

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical-Grand Rapids

|                             |                             |                             |                       |
|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | 20191119-1                  | <b>Date/Time Analyzed:</b>  | 11/26/19 03:18 AM     |
| <b>Lab ID:</b>              | 1911474-01A                 | <b>Dilution Factor:</b>     | 1.61                  |
| <b>Date/Time Collected:</b> | 11/20/19 11:49 AM           | <b>Instrument/Filename:</b> | msd30.i / 30112520sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.043          | D              | 0.14                  | 0.14 J            |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.



MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical-Grand Rapids

|                             |                             |                              |                       |
|-----------------------------|-----------------------------|------------------------------|-----------------------|
| <b>Client ID:</b>           | 20191119-2                  | <b>Date/Time Analyzed:</b>   | 11/26/19 04:02 AM     |
| <b>Lab ID:</b>              | 1911474-02A                 | <b>Dilution Factor:</b>      | 2.01                  |
| <b>Date/Time Collected:</b> | 11/20/19 11:45 AM           | <b>Instrument/File name:</b> | msd30.i / 30112521sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                              |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.054          | D              | 0.18                  | 0.15 J            |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
Viant Medical-Grand Rapids

|                             |                             |                              |                       |
|-----------------------------|-----------------------------|------------------------------|-----------------------|
| <b>Client ID:</b>           | 20191119-3                  | <b>Date/Time Analyzed:</b>   | 11/26/19 04:46 AM     |
| <b>Lab ID:</b>              | 1911474-03A                 | <b>Dilution Factor:</b>      | 1.68                  |
| <b>Date/Time Collected:</b> | 11/20/19 11:40 AM           | <b>Instrument/File name:</b> | msd30.i / 30112522sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                              |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.045          | D              | 0.15                  | 0.11 J            |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical-Grand Rapids

|                             |                             |                             |                       |
|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | 20191119-4                  | <b>Date/Time Analyzed:</b>  | 11/26/19 05:30 AM     |
| <b>Lab ID:</b>              | 1911474-04A                 | <b>Dilution Factor:</b>     | 1.44                  |
| <b>Date/Time Collected:</b> | 11/20/19 11:26 AM           | <b>Instrument/Filename:</b> | msd30.i / 30112523sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.039          | D              | 0.13                  | 0.14              |

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical-Grand Rapids

|                             |                             |                             |                       |
|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | 20191119-DUP                | <b>Date/Time Analyzed:</b>  | 11/26/19 06:14 AM     |
| <b>Lab ID:</b>              | 1911474-05A                 | <b>Dilution Factor:</b>     | 1.68                  |
| <b>Date/Time Collected:</b> | 11/20/19 11:26 AM           | <b>Instrument/Filename:</b> | msd30.i / 30112524sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.045          | D              | 0.15                  | 0.13 J            |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical-Grand Rapids

|                             |                             |                             |                       |
|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | 20191119-IA                 | <b>Date/Time Analyzed:</b>  | 11/26/19 06:55 AM     |
| <b>Lab ID:</b>              | 1911474-06A                 | <b>Dilution Factor:</b>     | 4.66                  |
| <b>Date/Time Collected:</b> | 11/20/19 11:58 AM           | <b>Instrument/Filename:</b> | msd30.i / 30112525sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.12           | D              | 0.42                  | 580               |

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical-Grand Rapids

|                             |                     |                             |                       |
|-----------------------------|---------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | Lab Blank           | <b>Date/Time Analyzed:</b>  | 11/25/19 11:54 AM     |
| <b>Lab ID:</b>              | 1911474-07A         | <b>Dilution Factor:</b>     | 1.00                  |
| <b>Date/Time Collected:</b> | NA - Not Applicable | <b>Instrument/Filename:</b> | msd30.i / 30112506sim |
| <b>Media:</b>               | NA - Not Applicable |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.027          | D              | 0.090                 | Not Detected      |

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical-Grand Rapids

|                             |                     |                             |                       |
|-----------------------------|---------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | CCV                 | <b>Date/Time Analyzed:</b>  | 11/25/19 08:47 AM     |
| <b>Lab ID:</b>              | 1911474-08A         | <b>Dilution Factor:</b>     | 1.00                  |
| <b>Date/Time Collected:</b> | NA - Not Applicable | <b>Instrument/Filename:</b> | msd30.i / 30112502sim |
| <b>Media:</b>               | NA - Not Applicable |                             |                       |

| Compound       | CAS#    | %Recovery |
|----------------|---------|-----------|
| Ethylene Oxide | 75-21-8 | 95        |

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical-Grand Rapids

|                             |                     |                             |                       |
|-----------------------------|---------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | LCS                 | <b>Date/Time Analyzed:</b>  | 11/25/19 09:29 AM     |
| <b>Lab ID:</b>              | 1911474-09A         | <b>Dilution Factor:</b>     | 1.00                  |
| <b>Date/Time Collected:</b> | NA - Not Applicable | <b>Instrument/Filename:</b> | msd30.i / 30112503sim |
| <b>Media:</b>               | NA - Not Applicable |                             |                       |

| Compound       | CAS#    | %Recovery |
|----------------|---------|-----------|
| Ethylene Oxide | 75-21-8 | 121       |

D: Analyte not within the DoD scope of accreditation.

\* % Recovery is calculated using unrounded analytical results.



MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical-Grand Rapids

|                             |                     |                             |                       |
|-----------------------------|---------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | LCSD                | <b>Date/Time Analyzed:</b>  | 11/25/19 10:10 AM     |
| <b>Lab ID:</b>              | 1911474-09AA        | <b>Dilution Factor:</b>     | 1.00                  |
| <b>Date/Time Collected:</b> | NA - Not Applicable | <b>Instrument/Filename:</b> | msd30.i / 30112504sim |
| <b>Media:</b>               | NA - Not Applicable |                             |                       |

| Compound       | CAS#    | %Recovery |
|----------------|---------|-----------|
| Ethylene Oxide | 75-21-8 | 123       |

D: Analyte not within the DoD scope of accreditation.

\* % Recovery is calculated using unrounded analytical results.

## APPENDIX D

### LABORATORY CHAIN OF CUSTODY

180 Blue Ravine Rd. Suite B, Folsom, CA 95630  
Phone (800) 985-5955 Fax (916) 351-8279

PID: NA Workorder #: NA

1911474

page of 1

Client: Rumbell Special Instructions/Notes:

Project Name: Vent Medical-Grand Rapids

Project Manager: Christine Ny Project # 1690010876

Sampler: Nick Marfin

Site Name: Vent Medical

Modified TO-15 SIM for ethylene  
Field-measured initial + final pressure  
included in this COC. Lab-measured initial  
pressure included on back of sample can this  
\* See sheet of data + COC

Turnaround Time (Rush surcharges may apply)

Standard ☒ Rush ☐ (specify)

Canister Vacuum/Pressure Lab Use Only Requested Analyses

| Lab ID | Field Sample Identification(Location) | Can # | Flow Controller # | Start Sampling Information |      | Stop Sampling Information |      | Initial (in Hg) | Final (in Hg) | Receipt | Final (psig)<br>Gas: N <sub>2</sub> / He | Ethylene Oxide |
|--------|---------------------------------------|-------|-------------------|----------------------------|------|---------------------------|------|-----------------|---------------|---------|--|----------------|
|        |                                       |       |                   | Date                       | Time | Date                      | Time |                 |               |         |  |                |

|     |              |        |       |          |      |            |      |      |     |  |  |  |
|-----|--------------|--------|-------|----------|------|------------|------|------|-----|--|--|--|
| 01A | 20191119-1   | 6L0494 | 22685 | 11/19/19 | 1146 | 11/20/2011 | 1149 | 28   | 6.5 |  |  |  |
| 02A | 20191119-2   | 6L0272 | 2487  |          | 1149 |            | 1145 | 30   | 5.5 |  |  |  |
| 03A | 20191119-3   | 6L2429 | 22206 |          | 1142 |            | 1140 | 28.5 | 7.5 |  |  |  |
| 04A | 20191119-4   | 6L1722 | 22189 |          | 1138 |            | 1126 | 28.5 | 4   |  |  |  |
| 05A | 20191119-BVP | 6L2434 | 22462 |          | 1138 |            | 1126 | 28   | 6.5 |  |  |  |
| 06A | 20191119-2A  | 6L1062 | 22850 |          | 1211 |            | 1150 | 29   | 5.5 |  |  |  |

Relinquished by: (Signature/Affiliation) [Signature] Date 11/20/2019 Time 1300 Received by: (Signature/Affiliation) Fedex Express Date 11/20/2011 Time 1300

Relinquished by: (Signature/Affiliation) [Signature] Date 11/20/2019 Time 1300 Received by: (Signature/Affiliation) [Signature] Date 11/21/19 Time 0945

Relinquished by: (Signature/Affiliation) [Signature] Date 11/21/19 Time 0945

Shipper Name: FedEx Custody Seats Intact? Yes Lab Use Only None

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

\* Consider 6L0973 damaged during deployment. Top of tube above valve broke off and no flow controller. No other apparent damage noted to consider on flow controller. Rumbell will follow up w/ lab personnel.

AMBIENT AIR SAMPLING AT VIAN T MEDICAL  
FACILITY, GRAND RAPIDS, MICHIGAN  
DECEMBER 2019 SAMPLING EVENT RESULTS

Prepared For:  
Hogan Lovells US LLP  
Denver, CO

On Behalf Of:  
Viant Medical  
Grand Rapids, MI

Prepared By:  
Ramboll US Corporation  
Arlington, VA

Date  
January 2020

Project Number  
1690010876

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## FIGURES

Figure 1: Map of Sampling Results

Figure 2: Wind Rose

## TABLES

Table 1: Outdoor Air Sampling Results, December 12-13, 2019

Table 2: Indoor Air Sampling Results, December 12-13, 2019

Table 3: Quality Control Criteria for TO-15 Sample Collection and Analysis, December 12-13, 2019

## APPENDICES

Appendix A: Air Sampling Program Results Summary

Appendix B: Photographs of Sampling Locations

Appendix C: Laboratory Analytical Report

Appendix D: Laboratory Chain of Custody

## 1. INTRODUCTION

Ramboll US Corporation (Ramboll) has prepared this report to summarize the sampling procedures and results of Ramboll's December 2019 air sampling event at the Viant Medical (Viant) facility located at 520 Watson Street Southwest in Grand Rapids, Michigan (the "facility" or the "site"). The sampling event was completed during a 24-hour period between December 12 and 13, 2019, and included the collection of five outdoor ambient air samples<sup>1</sup> and one indoor air (IA) sample, which were submitted for laboratory analysis of ethylene oxide (EtO). The sampling was performed in accordance with the scope of work outlined in the April 2019 Ambient Air Sampling Work Plan (the "April 2019 Work Plan") prepared by Ramboll. The sections below describe the sampling methodology and results from the December 2019 sampling event.

## 2. SAMPLING LOCATIONS

The five sampling locations selected during this event were the same locations sampled by Ramboll during previous events. Location #4 was selected for the placement of co-located samples, resulting in the collection of six samples in total. Sampling locations are depicted on Figure 1 and photographs of each sample are included in Appendix B.

## 3. METHODOLOGY

All six samples were collected using individually certified 6-liter stainless steel SUMMA® canisters equipped with individually certified 24-hour mass flow controllers provided by Eurofins Air Toxics (EAT). The canisters were secured to the same fixtures that were used during previous sampling events for sample collection within the breathing zone (approximately 5-6 feet). The co-located canister inlets at Location #4 were approximately 1-foot<sup>2</sup> away from each other.

Prior to sample collection at each location, a shut-in test was performed on each canister and mass flow controller using the methods described in the initial July 2019 sampling report. After the successful completion of each shut-in test, the valve on the canister was opened to begin collection of the 24-hour integrated sample. The recordkeeping and canister pressure monitoring methods used in the field during this event are the same as those described previously. The winds primarily blew from the south during the 24-hour sampling period, which began December 12, 2019 and ended December 13, 2019.

After approximately 24 hours from the start of the event, the valves on the canisters were closed, final field measurements were recorded, and samples were shipped overnight to EAT in Folsom, California for analysis of EtO using the methods specified in the April 2019 Work Plan. The laboratory received the canisters on December 14, 2019 and analyzed the samples on December 17, 2019.

Additionally, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) collected one canister sample at Location #4 in the same 24-hour time period as Ramboll's samples. EGLE's

---

<sup>1</sup> One of the samples was a co-located sample.

<sup>2</sup> Because of the diameter of the utility pole used to secure the canisters at Location #4, the canister inlets were placed one-foot from each other.

canister was sent to a different contract laboratory for analysis and will be discussed separately by EGLE.

## 4. RESULTS

The results from the December 2019 Ramboll sampling event are reported in Tables 1 and 2.

| Table 1: Outdoor Air Sampling Results, December 12-13, 2019                 |         |   |  |  |
|---|---------|---|--|--|
| Sample Location ID  | On-Site | Location Description                                | EtO Concentration ( $\mu\text{g}/\text{m}^3$ ) | Sample-Specific MDL ( $\mu\text{g}/\text{m}^3$ ) |
| 1   | Yes     | South of building in parking lot                    | 0.048 J  | 0.041  |
| 2   | Yes     | West of building, along western property boundary   | 0.12 J   | 0.042  |
| 3   | No      | Northwest of building along Watson Street Southwest | 0.10 J   | 0.042  |
| 4 (co-located samples)  | Yes     | North of building, northern corner of parking lot   | 0.54;<br>0.60 (co-located sample)              | 0.043;<br>0.040                                  |
| J = Laboratory-estimated value below the Reporting Limit but above the MDL. |         |   |  |  |

| Table 2: Indoor Air Sampling Results, December 12-13, 2019 |                      |  |  |
|--|----------------------|--|--|
| Sample Location ID   | Location Description | EtO Concentration ( $\mu\text{g}/\text{m}^3$ ) | Sample-Specific MDL ( $\mu\text{g}/\text{m}^3$ ) |
| IA   | Scrubber room        | 280  | 0.12   |

EtO was detected in all samples collected during the December 2019 event. The EtO concentration in outdoor ambient air samples ranged from 0.048 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) at Location #1 to 0.60  $\mu\text{g}/\text{m}^3$  in a co-located sample at Location #4 (Figure 1). Except for the co-located samples, all outdoor sample concentrations were reported below the laboratory reporting limit, and therefore laboratory-estimated values are provided for these samples. EGLE provided meteorological data collected in five-minute intervals from its Grand Rapids – Monroe Street air monitoring site, which is approximately 1.7 miles north-northeast of Viant.<sup>3</sup> As evident from a wind rose prepared using the meteorological data (Figure 2), winds were generally blowing from the south during the sampling event. Wind speeds varied between 3 and 11 miles per hour (mph). The EtO concentration inside the scrubber room was 280  $\mu\text{g}/\text{m}^3$ . A summary of results from this and prior Ramboll sampling events is provided in Appendix A.

<sup>3</sup> The Grand Rapids – Monroe Street air monitoring site is part of the state's air monitoring network as well as the federal NCore multipollutant monitoring network. Meteorological measurements collected at the site are subject to quality assurance procedures in the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV: Meteorological Measurements Version 2.0.



## 5. QUALITY ASSURANCE

Ramboll evaluated data quality based on acceptance criteria specified by the United States Environmental Protection Agency (USEPA) for precision, completeness, bias, and sensitivity in accordance with the April 2019 Work Plan. To evaluate the repeatability of sampling procedures, one co-located sample was collected at Location #4 during this investigation. The difference in concentrations of EtO detected in these co-located samples was 10.5% (using the calculated average detected concentration as the denominator) and within the acceptable range of 25%, as defined in the April 2019 Work Plan. Additionally, a laboratory replicate sample analysis of the sample collected at Location #1 was performed. In this replicate analysis, the difference in detected concentration of EtO was approximately 35.9% (using the calculated average detected concentration as the denominator). While the acceptable difference in concentrations of EtO detected in replicate analyses is 25% for sample concentrations greater than five times the reporting limit, the measured concentrations were both below the reporting limit ( $0.14 \mu\text{g}/\text{m}^3$ ), and therefore the percentage difference is not required to meet the target acceptance criteria of 25%.<sup>4</sup> Given the sensitivity of the laboratory analytical method, the laboratory diluted the sample collected inside the scrubber room, which increased the Minimum Detection Limit (MDL) above the target MDL for this sample. A summary of all quality assurance criteria related to the December 2019 sampling event is provided in Table 3 below.

---

<sup>4</sup> According to the laboratory report, the sample concentrations of EtO were near the sample-specific MDL of  $0.041 \mu\text{g}/\text{m}^3$  which likely influenced the precision of the replicate analyses.

| Table 3: Quality Control Criteria for TO-15 Sample Collection and Analysis, December 12-13, 2019 |                                |   |  |  |  |
|--|--------------------------------|---|--|--|--|
| Quality Control Sample   | Data Quality Indicators (DQIs) | Frequency   | Acceptance Criteria  | December 2019 Outcome                            | Corrective Action  |
| Co-located sample  | Precision                      | 1 per day   | Within 25%   | 10.5%  | N/A  |
| Replicate sample   | Precision                      | 1 per batch   | Within 25% for sample concentrations greater than five times reporting limit | 35.9%  | None; reanalysis not required because sample concentration was not greater than five times reporting limit |
| Valid sample count   | Completeness                   | N/A   | 85% or more of total samples   | 100% (100% for total sampling program)           | N/A  |
| Canister batch blank   | Bias                           | After analysis of standards and prior to sample analysis, or when contamination is present. | Below the reporting limit  | Below reporting limit of 0.090 µg/m <sup>3</sup> | N/A  |
| Method Detection Limit   | Sensitivity                    | 1 per method modification   | 0.05 ppb (0.09 µg/m <sup>3</sup> ) or less                                   | N/A* (no change to method)                       | N/A  |
| Sampling period  | Field QC                       | All samples   | 24 hours +/- 1 hour  | All samples                                      | N/A  |
| *Sample-specific MDLs noted in Tables 1 and 2 may be affected by dilution.                       |                                |   |  |  |  |

## 6. CONCLUSIONS

EtO was detected at concentrations in ambient air surrounding the Viant facility at concentrations between 0.048 µg/m<sup>3</sup> and 0.60 µg/m<sup>3</sup> during the December 2019 sampling event, with the highest concentration observed in the predominant downwind direction relative to the site building.

FIGURE 1  
MAP OF SAMPLING RESULTS

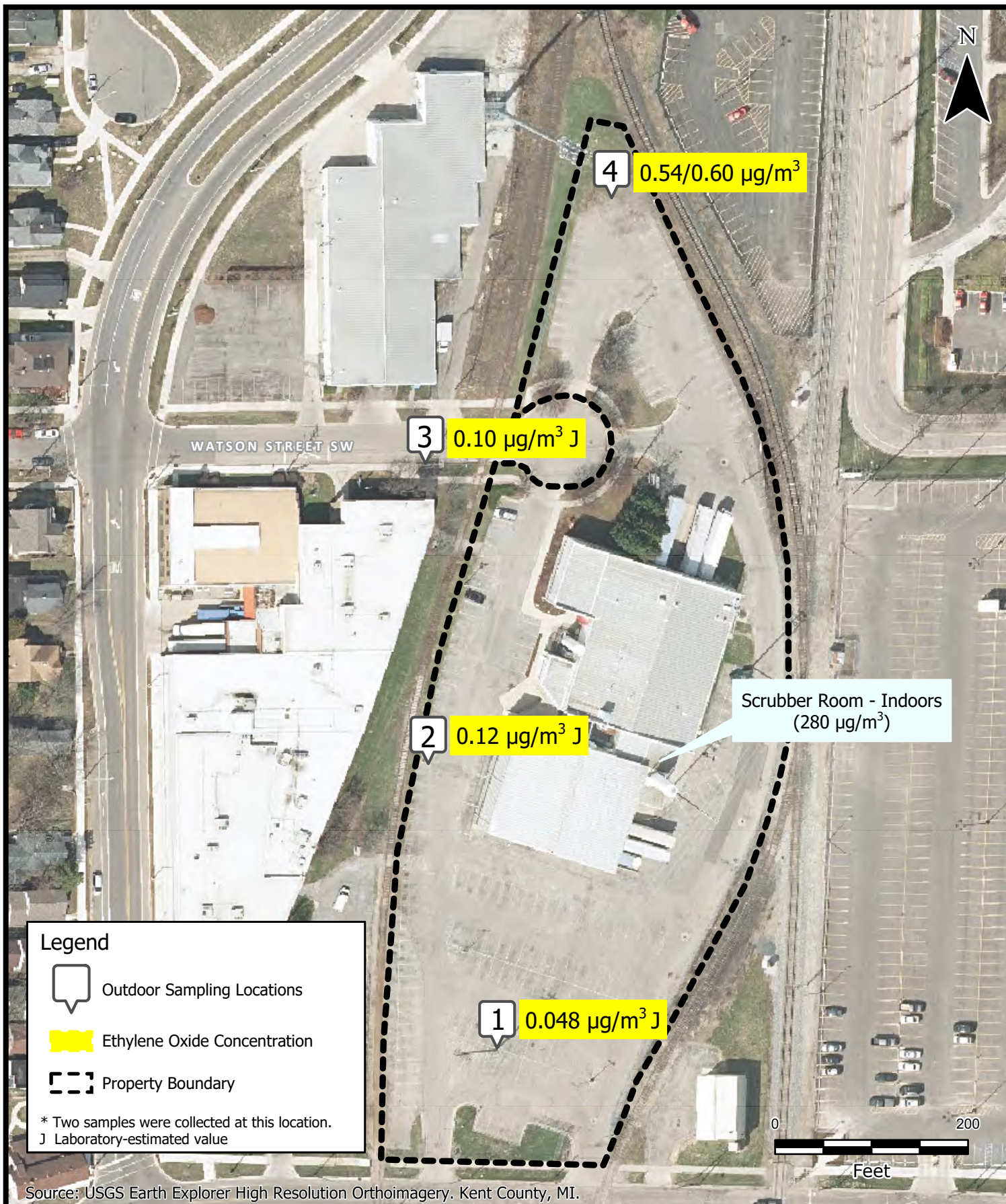


FIGURE 2  
WIND ROSE

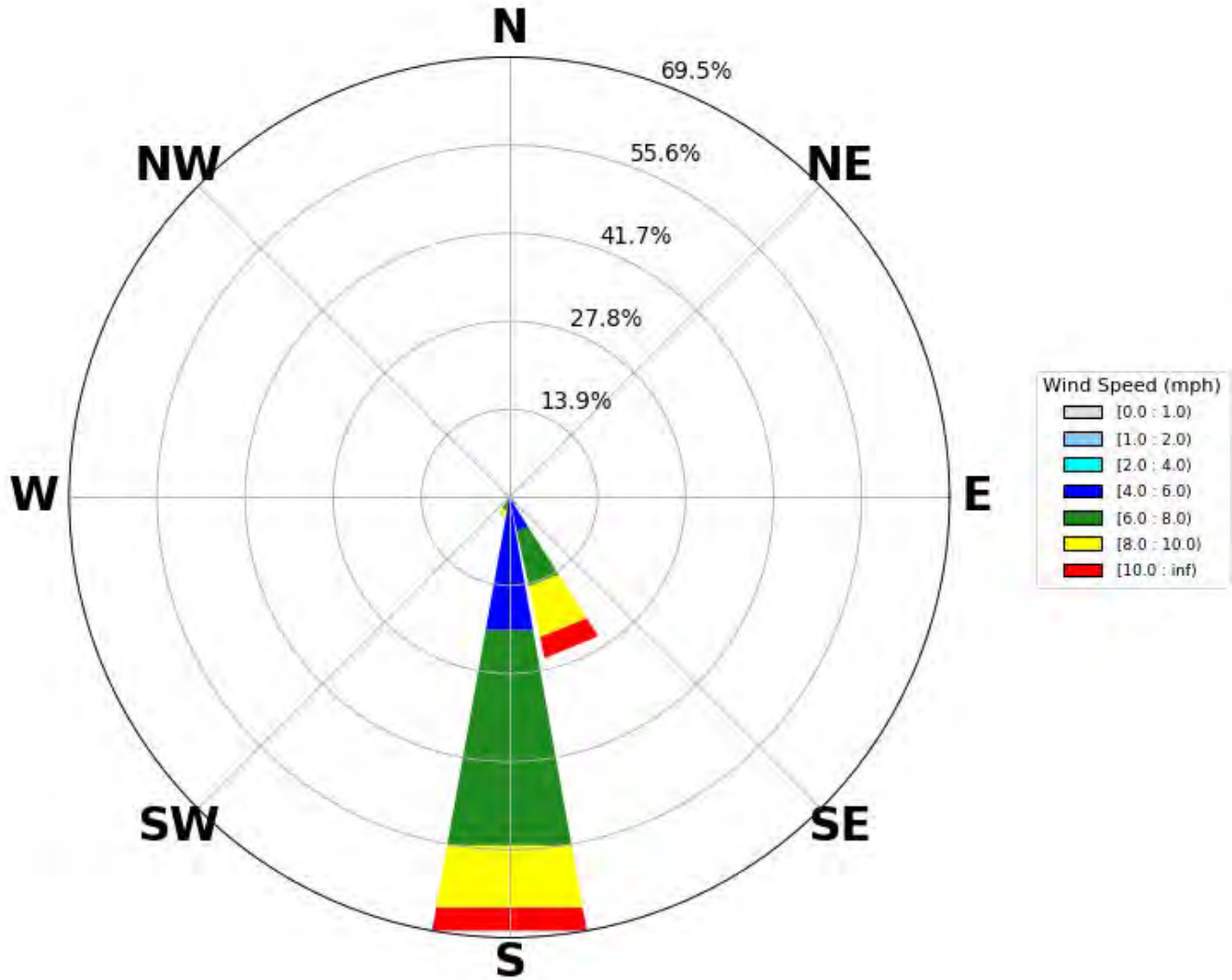


WIND ROSE PLOT:

**EGLE Met Station - Grand Rapids, MI**  
Monroe Ave, south of Leonard St.

DISPLAY:

**Wind Speed**  
**Direction (blowing from)**



COMMENTS:

DATA PERIOD:

**Start Date:**  
**12/12/2019 - 11:46**

**End Date:**  
**12/13/2019 - 12:00**

CALM WINDS:

**0%**

AVG. WIND SPEED:

**6.59 mph**

## WIND ROSE FOR EGLE GRAND RAPIDS METEOROLOGICAL STATION

COMPANY NAME:

**Viant Medical**

DATE:

**1/3/2020**

DRAFTED BY:

**HA**

FIGURE  
2

**RAMBOLL**

APPENDIX A  
AIR SAMPLING PROGRAM RESULTS  
SUMMARY

Ethylene Oxide Concentrations ( $\mu\text{g}/\text{m}^3$ ) in Outdoor Air

| Sample Dates (24-Hour Period) | Predominant Wind Direction(s) During Event | Location ID and Description |                  |   |                            |
|-------------------------------|--|-----------------------------|------------------|---|----------------------------|
|                               |  | #1                          | #2               | #3  | #4                         |
|                               |  | South of Building           | West of Building | Northwest of Building (off-site along Watson Street SW) | North of Building          |
| 7/9/2019 - 7/10/2019          | SE   | 0.27                        | 0.77             | 0.98  | 1.8 (Note 1)               |
| 8/12/2019 - 8/13/2019         | W, NW, N, NE                               | 2.5                         | 0.22             | 0.21  | 0.28 / 0.28 <sup>c</sup>   |
| 9/10/2019 - 9/11/2019         | SW, S                                      | 0.38                        | 0.51             | 0.40  | 0.90 / 0.76 <sup>c</sup>   |
| 10/16/2019 - 10/17/2019       | NW   | 0.20 / 0.20 <sup>c</sup>    | 0.15 J           | 0.34  | 0.16                       |
| 11/19/2019 - 11/20/2019       | SW   | 0.14 J                      | 0.15 J           | 0.11 J  | 0.14 / 0.13 <sup>c</sup> J |
| 12/12/2019 - 12/13/2019       | S  | 0.048 J                     | 0.12 J           | 0.10 J  | 0.54 / 0.60 <sup>c</sup>   |

Notes:

/ = Quality control sampling data is separated by a slash (/)

<sup>c</sup> = Co-located sample

J = Laboratory-estimated value

Note 1 = Result represents an average concentration over a 21-hour period



Ethylene Oxide Concentrations ( $\mu\text{g}/\text{m}^3$ ) in Indoor Air

|                               | Location ID and Description |
|-------------------------------|-----------------------------|
| Sample Dates (24-Hour Period) | IA (Scrubber Room)          |
| 7/9/2019 - 7/10/2019          | 440 / 450 <sup>c</sup>      |
| 8/12/2019 - 8/13/2019         | 460                         |
| 9/10/2019 - 9/11/2019         | 710                         |
| 10/16/2019 - 10/17/2019       | 590                         |
| 11/19/2019 - 11/20/2019       | 580                         |
| 12/12/2019 - 12/13/2019       | 280                         |

Notes:

/ = Quality control sampling data is separated by a slash (/)

<sup>c</sup> = Co-located sample

## APPENDIX B

### PHOTOGRAPHS OF SAMPLING LOCATIONS



Photo 1: View of sample collection at location #1, facing south.



Photo 2: View of sample collection at location #2, facing west.





Photo 3: View of sample collection at location #3, facing north.



Photo 4: View of co-located sample collection at location #4, facing north. Sample collected by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) also pictured (center canister).



## Site Photographs

Viant Medical  
520 Watson Street Southwest, Grand Rapids, Michigan  
December 2019



Photo 5: View of sample collection at indoor air (IA) location within scrubber room.

## APPENDIX C LABORATORY ANALYTICAL REPORT

12/31/2019

Ms. Christine Ng

Ramboll

4350 N. Fairfax Drive

Suite 300

Arlington VA 22203

Project Name: Viant Medical Grand Rapids

Project #: 1690010876

Workorder #: 1912331

Dear Ms. Christine Ng

The following report includes the data for the above referenced project for sample(s) received on 12/14/2019 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 SIM are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott

Project Manager

# WORK ORDER #: 1912331

## Work Order Summary

|                        |  |                  |   |
|------------------------|--|------------------|---|
| <b>CLIENT:</b>         | Ms. Christine Ng<br>Ramboll<br>4350 N. Fairfax Drive<br>Suite 300<br>Arlington, VA 22203 | <b>BILL TO:</b>  | Accounts Payable<br>Ramboll<br>333 West Wacker Drive<br>Suite 2700<br>Chicago, IL 60606 |
| <b>PHONE:</b>          | 703-516-2382   | <b>P.O. #</b>    | WO-2019-ARL-01  |
| <b>FAX:</b>            | 703-516-2302   | <b>PROJECT #</b> | 1690010876 Viant Medical Grand Rapids   |
| <b>DATE RECEIVED:</b>  | 12/14/2019   | <b>CONTACT:</b>  | Ausha Scott   |
| <b>DATE COMPLETED:</b> | 12/27/2019   |                  |   |

| <u>FRACTION #</u> | <u>NAME</u>              | <u>TEST</u>        | <u>RECEIPT<br/>VAC./PRES.</u> | <u>FINAL<br/>PRESSURE</u> |
|-------------------|--------------------------|--------------------|-------------------------------|---------------------------|
| 01A               | 20191212-1               | Modified TO-15 SIM | 3.5 "Hg                       | 5 psi                     |
| 01AA              | 20191212-1 Lab Duplicate | Modified TO-15 SIM | 3.5 "Hg                       | 5 psi                     |
| 02A               | 20191212-2               | Modified TO-15 SIM | 4.0 "Hg                       | 5 psi                     |
| 03A               | 20191212-3               | Modified TO-15 SIM | 4.5 "Hg                       | 5 psi                     |
| 04A               | 20191212-4               | Modified TO-15 SIM | 5.0 "Hg                       | 5 psi                     |
| 05A               | 20191212-DUP             | Modified TO-15 SIM | 3.0 "Hg                       | 5 psi                     |
| 06A               | 20191212-IA              | Modified TO-15 SIM | 7.0 "Hg                       | 5 psi                     |
| 07A               | Lab Blank                | Modified TO-15 SIM | NA                            | NA                        |
| 08A               | CCV                      | Modified TO-15 SIM | NA                            | NA                        |
| 09A               | LCS                      | Modified TO-15 SIM | NA                            | NA                        |
| 09AA              | LCSD                     | Modified TO-15 SIM | NA                            | NA                        |

CERTIFIED BY:



Technical Director

DATE: 12/27/19

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279



**LABORATORY NARRATIVE**  
**EPA TO-15 Ethylene oxide (SIM)**  
**Ramboll**  
**Workorder# 1912331**

Six 6 Liter Summa Canister (EO) samples were received on December 14, 2019. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the SIM acquisition mode for the measurement of Ethylene oxide in ambient air.

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

The laboratory sample duplicate exceeded the method required 25%RPD criterion with a precision of 35%RPD. However, the sample concentrations measured in each run were near the method detection limit which likely influenced the measured precision.

Ethylene Oxide is not included on the laboratory's NELAP scope of accreditation for TO-15 SIM. However, TO-15 method and NELAP quality requirements were met.

As per project specific client request the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. The canisters used for this project have been certified to the Reporting Limit for Ethylene Oxide. Concentrations that are below the level at which the canister was certified may be false positives.

Dilution was performed on sample 20191212-IA due to the presence of high level target species.

**Definition of Data Qualifying Flags**

Nine qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

CN - See Case Narrative

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                             |                             |                       |
|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | 20191212-1                  | <b>Date/Time Analyzed:</b>  | 12/17/19 04:48 PM     |
| <b>Lab ID:</b>              | 1912331-01A                 | <b>Dilution Factor:</b>     | 1.52                  |
| <b>Date/Time Collected:</b> | 12/13/19 11:52 AM           | <b>Instrument/Filename:</b> | msd30.i / 30121709sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.041          | D              | 0.14                  | 0.048 J           |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                             |                             |                       |
|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | 20191212-1 Lab Duplicate    | <b>Date/Time Analyzed:</b>  | 12/17/19 05:32 PM     |
| <b>Lab ID:</b>              | 1912331-01AA                | <b>Dilution Factor:</b>     | 1.52                  |
| <b>Date/Time Collected:</b> | 12/13/19 11:52 AM           | <b>Instrument/Filename:</b> | msd30.i / 30121710sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.041          | D              | 0.14                  | 0.069 J           |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                             |                             |                       |
|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | 20191212-2                  | <b>Date/Time Analyzed:</b>  | 12/17/19 06:17 PM     |
| <b>Lab ID:</b>              | 1912331-02A                 | <b>Dilution Factor:</b>     | 1.55                  |
| <b>Date/Time Collected:</b> | 12/13/19 11:45 AM           | <b>Instrument/Filename:</b> | msd30.i / 30121711sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.042          | D              | 0.14                  | 0.12 J            |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                             |                              |                       |
|-----------------------------|-----------------------------|------------------------------|-----------------------|
| <b>Client ID:</b>           | 20191212-3                  | <b>Date/Time Analyzed:</b>   | 12/17/19 07:01 PM     |
| <b>Lab ID:</b>              | 1912331-03A                 | <b>Dilution Factor:</b>      | 1.58                  |
| <b>Date/Time Collected:</b> | 12/13/19 11:39 AM           | <b>Instrument/File name:</b> | msd30.i / 30121712sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                              |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.042          | D              | 0.14                  | 0.10 J            |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                             |                             |                       |
|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | 20191212-4                  | <b>Date/Time Analyzed:</b>  | 12/17/19 07:45 PM     |
| <b>Lab ID:</b>              | 1912331-04A                 | <b>Dilution Factor:</b>     | 1.61                  |
| <b>Date/Time Collected:</b> | 12/13/19 11:11 AM           | <b>Instrument/Filename:</b> | msd30.i / 30121713sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.043          | D              | 0.14                  | 0.54              |

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                             |                             |                       |
|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | 20191212-DUP                | <b>Date/Time Analyzed:</b>  | 12/17/19 08:30 PM     |
| <b>Lab ID:</b>              | 1912331-05A                 | <b>Dilution Factor:</b>     | 1.49                  |
| <b>Date/Time Collected:</b> | 12/13/19 11:11 AM           | <b>Instrument/Filename:</b> | msd30.i / 30121714sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.040          | D              | 0.13                  | 0.60              |

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                             |                             |                       |
|-----------------------------|-----------------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | 20191212-IA                 | <b>Date/Time Analyzed:</b>  | 12/17/19 09:11 PM     |
| <b>Lab ID:</b>              | 1912331-06A                 | <b>Dilution Factor:</b>     | 4.66                  |
| <b>Date/Time Collected:</b> | 12/13/19 12:00 PM           | <b>Instrument/Filename:</b> | msd30.i / 30121715sim |
| <b>Media:</b>               | 6 Liter Summa Canister (EO) |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.12           | D              | 0.42                  | 280               |

D: Analyte not within the DoD scope of accreditation.



MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                     |                             |                       |
|-----------------------------|---------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | Lab Blank           | <b>Date/Time Analyzed:</b>  | 12/17/19 01:25 PM     |
| <b>Lab ID:</b>              | 1912331-07A         | <b>Dilution Factor:</b>     | 1.00                  |
| <b>Date/Time Collected:</b> | NA - Not Applicable | <b>Instrument/Filename:</b> | msd30.i / 30121706sim |
| <b>Media:</b>               | NA - Not Applicable |                             |                       |

| Compound       | CAS#    | MDL<br>(ug/m3) | LOD<br>(ug/m3) | Rpt. Limit<br>(ug/m3) | Amount<br>(ug/m3) |
|----------------|---------|----------------|----------------|-----------------------|-------------------|
| Ethylene Oxide | 75-21-8 | 0.027          | D              | 0.090                 | Not Detected      |

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                     |                             |                       |
|-----------------------------|---------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | CCV                 | <b>Date/Time Analyzed:</b>  | 12/17/19 10:03 AM     |
| <b>Lab ID:</b>              | 1912331-08A         | <b>Dilution Factor:</b>     | 1.00                  |
| <b>Date/Time Collected:</b> | NA - Not Applicable | <b>Instrument/Filename:</b> | msd30.i / 30121702sim |
| <b>Media:</b>               | NA - Not Applicable |                             |                       |

| Compound       | CAS#    | %Recovery |
|----------------|---------|-----------|
| Ethylene Oxide | 75-21-8 | 82        |

D: Analyte not within the DoD scope of accreditation.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                     |                             |                       |
|-----------------------------|---------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | LCS                 | <b>Date/Time Analyzed:</b>  | 12/17/19 10:44 AM     |
| <b>Lab ID:</b>              | 1912331-09A         | <b>Dilution Factor:</b>     | 1.00                  |
| <b>Date/Time Collected:</b> | NA - Not Applicable | <b>Instrument/Filename:</b> | msd30.i / 30121703sim |
| <b>Media:</b>               | NA - Not Applicable |                             |                       |

| Compound       | CAS#    | %Recovery |
|----------------|---------|-----------|
| Ethylene Oxide | 75-21-8 | 79        |

D: Analyte not within the DoD scope of accreditation.

\* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS SIM  
 Viant Medical Grand Rapids

|                             |                     |                             |                       |
|-----------------------------|---------------------|-----------------------------|-----------------------|
| <b>Client ID:</b>           | LCSD                | <b>Date/Time Analyzed:</b>  | 12/17/19 11:25 AM     |
| <b>Lab ID:</b>              | 1912331-09AA        | <b>Dilution Factor:</b>     | 1.00                  |
| <b>Date/Time Collected:</b> | NA - Not Applicable | <b>Instrument/Filename:</b> | msd30.i / 30121704sim |
| <b>Media:</b>               | NA - Not Applicable |                             |                       |

| Compound       | CAS#    | %Recovery |
|----------------|---------|-----------|
| Ethylene Oxide | 75-21-8 | 97        |

D: Analyte not within the DoD scope of accreditation.

\* % Recovery is calculated using unrounded analytical results.

## APPENDIX D

### LABORATORY CHAIN OF CUSTODY

