**DEPARTMENT OF THE AIR FORCE**
**AIR FORCE CIVIL ENGINEER CENTER**
**JOINT BASE CHARLESTON SOUTH CAROLINA**

31 March 2025

Ms. Laura Powers
AFCEC/CZOE, JB Charleston ISS
203 S. Davis Drive, Bldg 247, 1st Floor
Joint Base Charleston, SC 29404-4707

Mr. Robert A. Dunn, Hydrogeologist
Underground Storage Tank Management Division
Bureau of Land and Waste Management
South Carolina Dept. of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201

RE: Draft Final Site-Specific Work Plan and Groundwater Monitoring Report for AOC T (TU544), Building 129 UST (GWPD #16344), Joint Base Charleston-Air, South Carolina

Dear Mr. Dunn,

The purpose of this letter is to submit one (1) hardcopy and electronic copy (CD) of the subject plan for Area of Concern T (AOC T, TU544, GWPD #16344) at Joint Base Charleston-Air, South Carolina for your review and approval. Should you have any questions or comments regarding the attached, please contact me by telephone at (843) 963-2701 or by email at laura.powers.3@us.af.mil.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. This document is signed and certified in accordance with R.61-79.270.11 and 270.30(K).

Sincerely,

LAURA POWERS, GS-12, DAFC
Remedial Project Manager

cc: Elizabeth Rhine (Bhate Environmental Associates, Inc.)

# Site-Specific Work Plan for Approved ACQAP
# Underground Storage Tank Management Division

To: Robert Dunn (SCDHEC Project Manager)
From: Elizabeth Rhine (Contractor Project Manager)
Contractor: Bhate Environmental Associates, Inc. UST Contractor Certification Number: UCC0439

Facility Name: TU544 (Area of Concern [AOC] T), Building 129 UST UST Permit #: 16344
Facility Address: 101 Hill Blvd, Bldg 129, Joint Base Charleston, South Carolina 20404
Responsible Party: United States Air Force Phone: 843-963-2701
RP Address: 203 S Davis Drive, Building 247, 1st Floor, JBCA, South Carolina 29404-4707
Property Owner (if different): Not Applicable
Property Owner Address: Not Applicable
Current Use of Property: Joint Air Base

**Scope of Work** (Please check all that apply)

- ☐ IGWA
- ☐ Tier II
- ☐ Groundwater Sampling
- ☐ GAC
- ☐ Tier I
- ☐ Monitoring Well Installation
- ☑ Other Installation and operation of a biosparge system

**Analyses** (Please check all that apply)

Groundwater/Surface Water:

- ☐ BTEXNMDCA (8260D)
- ☐ Oxygenates (8260D)
- ☐ EDB (8011)
- ☐ PAH (8270E)
- ☐ Lead
- ☐ 8 RCRA Metals
- ☐ TPH
- ☐ pH
- ☐ BOD
- ☐ Nitrate
- ☐ Sulfate
- ☐ Methane
- ☐ Ethanol
- ☐ Dissolved Iron
- ☑ Other BTEX+Naphthalene (8260D) and Naphthalene (2870E SIM)

Drinking Water Supply Wells:

- ☐ BTEXNMDCA (524.2)
- ☐ Oxygenates & Ethanol (8260D)
- ☐ Mecury (200.8 245.1 or 245.2)
- ☐ RCRA Metals (200.8)
- ☐ EDB (504.1)

Soil:

- ☐ BTEXNM
- ☐ Lead
- ☐ RCRA Metals
- ☐ TPH-DRO (3550B/8015B)
- ☐ Grain Size
- ☐ PAH
- ☐ Oil & Grease (9071)
- ☐ TPH-GRO (5030B/8015B)
- ☐ TOC

Air:

- ☐ BTEXN

**Sample Collection** (Estimate the number of samples of each matrix that are expected to be collected.)

| | | | |
|---|---|---|---|
| _____ Soil | 0 Water Supply Wells | 1 Air | 0 Field Blank |
| 3 Monitoring Wells | 0 Surface Water | 1 Duplicate | 1 Trip Blank |

**Field Screening Methodology**

Estimate number and total completed depth for each point, and include their proposed locations on the attached map.

# of shallow points proposed: 1 Estimated Footage: 2 feet per point
# of deep points proposed: 3 Estimated Footage: 18 feet per point
Field Screening Methodology: Photoionization Detector (PID)

**Permanent Monitoring Wells**

Estimate number and total completed depth for each well, and include their proposed locations on the attached map.

# of shallow wells: 0 Estimated Footage: _____ feet per point
# of deep wells: 0 Estimated Footage: _____ feet per point
# of recovery wells: 0 Estimated Footage: _____ feet per point
Comments, if warranted:

UST Permit #: 16344 Facility Name: TU544 (Area of Concern [AOC] T), Building 129 UST

**Implementation Schedule** (Number of calendar days from approval)

Field Work Start-Up: 30 Field Work Completion: 104

Report Submittal: 180 # of Copies Provided to Property Owners: NA

**Aquifer Characterization**

Pump Test: ☐ Slug Test: ☐ (Check one and provide explanation below for choice)

None

**Investigation Derived Waste Disposal**

Soil: <1 Tons Purge Water: ~100 Gallons

Drilling Fluids: 0 Gallons Free-Phase Product: none Gallons

**Additional Details For This Scope of Work**

For example, list wells to be sampled, wells to be abandoned/repaired, well pads/bolts/caps to replace, details of AFVR event, etc.

See Attachment 2 for installation and operation of three temporary biosparge wells and one vapor point, as well as the associated performance monitoring.

**Compliance With Annual Contractor Quality Assurance Plan (ACQAP)**

No Laboratory as indicated in ACQAP? (Yes/No) If no, indicate laboratory information below.

Name of Laboratory: Pace Analytical National Center

SCDHEC Certification Number: 84004002

Name of Laboratory Director: Chris Johnson

No Well Driller as indicated in ACQAP? (Yes/No) If no, indicate driller information below.

Name of Well Driller: Edge Solutions

SCLLR Certification Number: 1407A

None Other variations from ACQAP. Please describe below.

**Attachments**

1. Attach a copy of the relevant portion of the USGS topographic map showing the site location.

2. Prepare a site base map. This map must be accurately scaled, but does not need to be surveyed. The map must include the following:

| | |
|---|---|
| North Arrow | Proposed monitoring well locations |
| Location of property lines | Legend with facility name and address, UST permit number, and bar scale |
| Location of buildings | Streets or highways (indicate names and numbers) |
| Previous soil sampling locations | Location of all present and former ASTs and USTs |
| Previous monitoring well locations | Location of all potential receptors |
| Proposed soil boring locations | |

3. Assessment Component Cost Agreement, SCDHEC Form D-3664

Site Vicinity and Location
USGS Topographic Map

**Attachment 1**

Site Specific Work Plan and Groundwater Monitoring Report
for AOC T (TU544) UST 16344
Joint Base Charleston - Air, South Carolina

DRAWN BY: MRM

DATE: 1/14/2025

SCALE: As Shown

PROJECT NO: SAS2300.1000.02.31AA

bhate

www.bhate.com

# Attachment 2

## Site-Specific Work Plan and Groundwater Monitoring Report for Area of Concern (AOC) T (TU544)

# SECTION A: PROJECT MANAGEMENT

## A1 TITLE AND APPROVAL PAGE

| | |
|---|---|
| *Project Name and Site Location:* | Quality Assurance Project Plan Addendum<br>to the SCDES UST Programmatic QAPP for<br>Area of Concern (AOC) T (TU544)<br><br>Joint Base Charleston – Air (JBCA)<br>Charleston, South Carolina (SC)<br><br>Facility Identification (ID) SC3570024460<br><br>Permit #01827 |
| *Contract Number:* | Carolina Group Optimized Remediation Contract (ORC)<br>W912HN-23-C-1000 |
| *Prepared on behalf of:* | Air Force Civil Engineer Center (AFCEC)<br>2261 Hughes Avenue, Suite 155<br>Joint Base San Antonio Lackland Air Force Base, Texas 78236 |
| *Prepared by:* | Bhate Environmental Associates, Inc. (Bhate)<br>1608 13th Avenue South, Suite 300<br>Birmingham, Alabama (AL) 35205 |
| *Certified Contractor Number:* | UCC0439 |
| *Document Title:* | Site-Specific Work Plan and Groundwater Monitoring Report<br>for Area of Concern [AOC] T (TU544)<br>Joint Base Charleston – Air (JBCA)<br>South Carolina |
| *Preparation Date:* | March 2025 |

## APPROVALS

| Name/Title | Signature | Date |
|---|---|---|
| **Robert Dunn**<br>South Carolina Department of Environmental Control (SCDES) Hydrogeologist/ Underground Storage Tank (UST) Technical Project Manager (PM) | | |
| **Erin Epperson**<br>SCDES UST QAPP Coordinator | | |
| **Shauna Stotler**<br>United States Army Corps of Engineers (USACE) Contracting Officer's Representative (COR) | | |
| **Laura Powers**<br>AFCEC JBCA Remedial Project Manager (RPM) | | |
| **Phil Bambach, Professional Geologist ([PG] Number 2893)**<br>Bhate Installation PM |  | 3/31/25 |
| **Elizabeth Rhine**<br>Bhate Program Manager (i.e., Optimized Remediation Contract [ORC]) |  | 3/31/25 |
| **Marcia Olive**<br>Bhate Program Chemist | | |
| **Corey Green**<br>Bhate Program Quality Assurance (QA)/Quality Control (QC) Manager | | |
| **Caitlin Ryan**<br>Bhate Field Technician | | |
| **Chris Johnson**<br>Pace National Laboratory Director | | |
| **Ruth Welsh**<br>Pace National Project Manager | | |

# Table of Contents


**Attachment 2** ..... 1

**SECTION A: PROJECT MANAGEMENT** ..... 1

**A1 Title and Approval Page** ..... 1

**Approvals** ..... 2

**Table of Contents** ..... 3

**List of Acronyms** ..... 6

**A3 Distribution and Project Organization List** ..... 9

**Table 1A Addendum Distribution and Project Organization List** ..... 9

**A4 Project Organization** ..... 10

**A5 Problem Definition/Background** ..... 10

**A6 Project/Task Description and Schedule** ..... 12

***Treatment System Installation Activities*** ..... 13

***BSp Well and Vapor Point Monitoring Design/Specifications*** ..... 13

***Management of Soil Cuttings*** ..... 13

***BSp Equipment Setup and Operating Parameters*** ..... 14

***System Startup and Bioaugmentation*** ..... 14

***System Operation*** ..... 15

***Performance Monitoring*** ..... 16

***Management of Purge Water*** ..... 16

***Reporting*** ..... 17

**A7 Data Quality Objectives (DQOs)** ..... 17

**A8 Training and Certification** ..... 19

***Training*** ..... 19

***Laboratory Certification*** ..... 19

Ruth.Welsh@pacelabs.com ***Laboratory Standard Operating Procedures*** ..... 20

**A9 Documents and Records** ..... 20

**Table 2A Record Identification, Storage, and Disposal** ..... 21

**REFERENCES** ..... 22

**SECTION B: MEASUREMENT/DATA ACQUISITION** ..... 23

**B1 Sampling Process/Experimental Design** ..... 23

**Table 3A Sampling Activities** ..... 23

B2 Sampling Methods ..... 23
Table 4A Field Corrective Action ..... 24
B3 Sample Handling and Custody ..... 24
B4 Analytical Methods ..... 24
Table 5A Analytical SOPs and Referenced Methods ..... 24
Parameter ..... 24
Method Referenced ..... 24
Equipment/ Instrumentation ..... 24
Laboratory SOP ..... 24
B5 Quality Control Requirements ..... 25
B6 Field Instrument and Equipment Testing, Inspection, and Maintenance ..... 25
Table 6A Instrument and Equipment Maintenance ..... 25
B7 Instrument Calibration and Frequency ..... 25
Table 7A Instrument Calibration Criteria and Corrective Action ..... 25
B8 Inspection/Acceptance Requirements for Supplies and Consumables ..... 25
B9 Data Acquisition Requirements (Non-Direct Measurements) ..... 26
Table 8A Non-Direct Measurements ..... 26
B10 Data Management ..... 26
SECTION C: ASSESSMENT AND OVERSIGHT ..... 27
C1 Assessment and Response Actions ..... 27
C2 Reports to Management ..... 27
SECTION D DATA VALIDATION AND USABILITY ..... 28

**Figures (Figure 1 provided on page 10)**

Figure 1. Project Organizational Chart

Figure 2. AOC T (TU544) Site Map

Figure 3. AOC T (TU544) Potentiometric Surface (September 2023)

Figure 4. AOC T (TU544) September 2023 and April 2024 Groundwater Sampling Data

Figure 5. AOC T (TU544) Biosparge Well Locations

**Tables**

Table 1. Monitoring Well Construction Details and Groundwater Level Measurements (September 2023)

Table 2. Groundwater Monitoring Results (September 2023 and April 2024)

Table 3. Historical Groundwater Monitoring Data

Table 4. AOC T (TU544) Biosparge System - Air Sparge Pressure Design

**Attachments**

Attachment 3: Groundwater Sampling and Development Forms

Attachment 4: Laboratory and Data Validation Reports

Attachment 5: Field Notes, Well Diagram, Well Installation and Well Abandonment Forms

Attachment 6: Soil Gas Sampling and Summa Cannister Operation SOPs

# List of Acronyms

| Acronym | Definition |
|---|---|
| % | percent |
| AAFES | Army and Air Force Exchange Service |
| ACQAP | Annual Contractor Quality Assurance Plan |
| AFCEC | Air Force Civil Engineer Center |
| AFCEE | Air Force Center for Environment Excellence |
| AOC | Area of Concern |
| AR | Administration Record |
| bgs | below ground surface |
| Bhate | Bhate Environmental Associates, Inc. |
| BSp | biosparge |
| BTEX | benzene, toluene, ethylbenzene, and total xylenes |
| CASE | Corrective Action System Evaluations |
| cfm | cubic feet per minute |
| CHMM | Certified Hazardous Materials Manager |
| CIH | Certified Industrial Hygienist |
| COR | Contracting Officer's Representative |
| CPR | cardiopulmonary resuscitation |
| CSM | Conceptual Site Model |
| CSP | Certified Safety Professional |
| CZRE | Environmental Restoration Division - East Region |
| DO | dissolved oxygen |
| DoD | Department of Defense |
| DQO | Data Quality Objective |
| ERPIMS | Environmental Resources Program Information Management System |
| ft | feet or foot |
| FPM | FPM Remediations, Inc. |
| GIS | Geographical Information System |
| GPR | Ground penetrating radar |
| H&S | Health and Safety |
| HAZWOPER | Hazardous Waste Operations and Emergency Response |
| ID | Identification |
| JBCA | Joint Base Charleston - Air |
| JD | Juris Doctor |
| Koc | Organic carbon-water patrician coefficient |

| Acronym | Definition |
|---|---|
| LNAPL | Light non-aqueous phase liquid |
| µg/L | Micrograms per liter |
| mg/L | milligrams per liter |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| NELAC | National Environmental Laboratory Accreditation Conference |
| NFA | No Further Action |
| OIHPT | Optical Image Profiler Hydraulic Profiling Tool |
| ORC | Optimized Remediation Contract |
| ORP | oxidation reduction potential |
| OSHA | Occupational Safety and Health Administration |
| PAH | polycyclic aromatic hydrocarbon |
| PG | Professional Geologist |
| pH | potential of hydrogen |
| PID | Photoionization detector |
| PM | Project Manager |
| ppm | Parts per million |
| psi | Per square inch |
| PVC | polyvinyl chloride |
| QA | Quality Assurance |
| QAPP | Quality Assurance Project Plan |
| QC | Quality Control |
| QCM | Quality Control Manager |
| RBSL | South Carolina Risk Based Screening Level |
| REM | Registered Environmental Manager |
| ROI | radius of influence |
| RPM | Remedial Project Manager |
| SC | South Carolina |
| SCDES | South Carolina Department of Environmental Services (previously SCDHEC) |
| SCDHEC | South Carolina Department of Health and Environmental Control |
| SIM | Selected Ion Monitoring |
| SME | Subject Matter Expert |
| SOP | Standard Operating Procedure |
| Sr. | Senior |
| SSHO | Site Safety and Health Officer |

| Acronym | Definition |
|---|---|
| SVOC | semi-volatile organic compound |
| TBD | to be determined |
| UIC | Underground Injection Control |
| U.S. | United States |
| USACE | United States Army Corps of Engineers |
| USAF | United States Air Force |
| USEPA | United States Environmental Protection Agency |
| UST | Underground storage tank |

## A3 Distribution and Project Organization List

The project organization and distribution list are provided in the table below.

**Table 1A Addendum Distribution and Project Organization List**

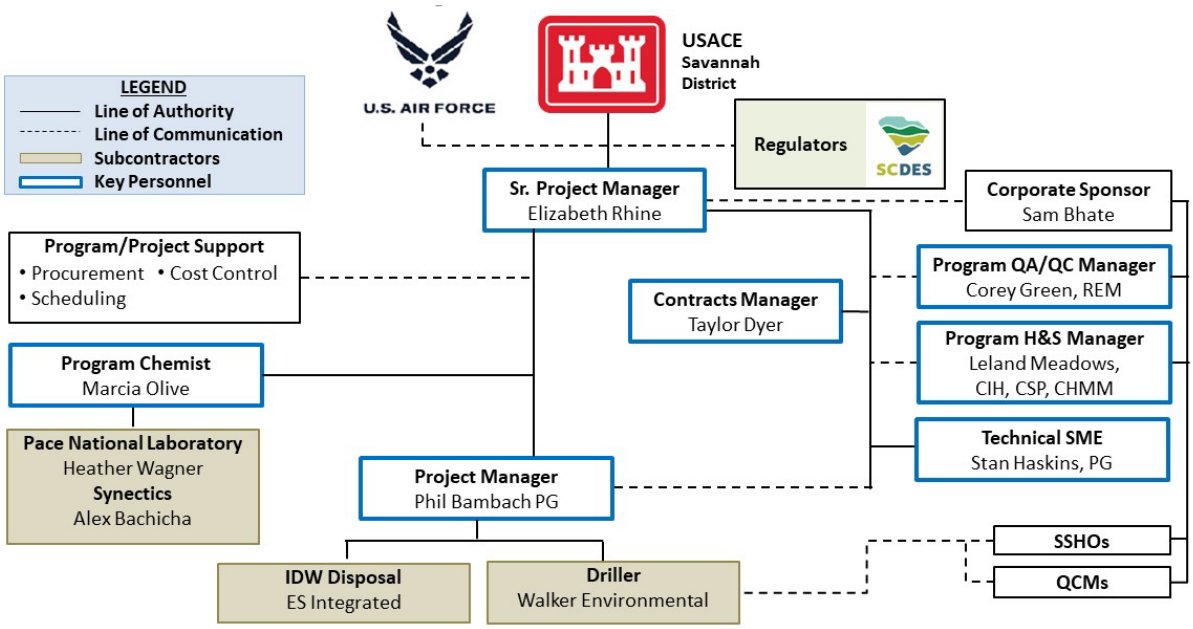
| Name | Title/Role from UST Master QAPP | Organization/Address | Telephone Number | E-mail Address |
|---|---|---|---|---|
| Erin Epperson | UST QAPP Coordinator | SCDES, UST Management Division<br>2600 Bull Street<br>Columbia, South Carolina 29201 | 803-898-0634<br>Fax: 803-898-0673 | erin.epperson@des.sc.gov |
| Robert Dunn | SCDES Hydrogeologist III | SCDES, UST Management Division<br>2600 Bull Street<br>Columbia, South Carolina 29201 | 803-898-0671 | Robert.Dunn@des.sc.gov |
| Shauna Stotler | USACE COR | 100 W. Oglethorpe Avenue<br>Savannah, Georgia 31401-3604 | 912-438-7361 | shauna.stotler@usace.army.mil |
| Laura Powers | JBCA RPM | AFCEC-JBCA<br>203 S Davis Drive, Building 247 1st Floor<br>Joint Base Charleston, South Carolina 29404-4707 | 843-963-2701 | laura.powers.3@us.af.mil |
| Phil Bambach<br>PG 2893<br>Expiration 6/30/25 | Bhate Installation PM | 123 Timbergate Drive<br>Lexington, South Carolina 29073 | 614-226-9479 | pbambach@bhate.com |
| Elizabeth Rhine | Bhate ORC PM | 305 Sasanqua Drive<br>Greenville, South Carolina 29615 | 864-982-9890 | Erhine@bhate.com |
| Corey Green | Bhate Program QA/QC Manager | 1608 13th Avenue South, Suite 300<br>Birmingham, Alabama 35205 | 205-918-4002 | cgreen@bhate.com |
| Caitlin Ryan | Bhate Field Staff | 5724 Sablewood Street<br>North Charleston, South Carolina 29406 | 205-260-9750 | cryan@bhate.com |
| Marcia Olive | Bhate Chemist | 455 Union Blvd.<br>Lakewood, Colorado 80228 | 303-725-7631 | molive@bhate.com |
| Ruth Welsh | Pace National Project Manager II | Pace Analytical National Center for Testing and Innovation Laboratory<br>120065 Lebanon Road<br>Mt. Juliet, Tennessee 37122 | 412-209-8995 | ruth.welsh@pacelabs.com |

*Certification records will be provided at the request of SCDES.*

## A4 Project Organization

The project organization is provided in **Figure 1** below.

**Figure 1 Project Organization Chart**




Notes: CHMM - Certified Hazardous Materials Manager; CIH - Certified Industrial Hygienist; CSP- Certified Safety Professional; H&S- Health and Safety; JBCA - Joint Base Charleston-Air; QCM- Quality Control Manager; REM - Registered Environmental Manager; SCDES - South Carolina Department of Environmental Services; SME – Subject Matter Expert; Sr. - Senior; SSHO - Site Safety and Health Officer; USACE - United States Army Corps of Engineers

## A5 Problem Definition/Background

Site TU544 is located adjacent to Building 129 at JBCA (**Figure 2**). The site consists of Coastal deposits (e.g., beach, tidal facies, and marsh) that is composed of clays and poorly-graded, fine-grained sands. The Cooper Marl confining unit is evident at an approximate depth of 18 feet (ft) to 20 ft below ground surface (bgs) (FPM Remediations, Inc. [FMP], April 2022). Groundwater flow direction is to the southeast as shown on **Figure 3**.

The site is the location of a former 500-gallon diesel underground storage tank (UST) on the south side Building 129. The UST was removed in 1991, plus 18 cubic yards of soil. Benzene, toluene, ethylbenzene, and total xylenes (BTEX), methyl-tert-butyl ether, 2-methynaphthalene, naphthalene, and polycyclic aromatic hydrocarbons (PAHs) were identified as contaminants of potential concern in groundwater. Remedial actions completed since 1991 include passive skimmers, Vacuum Enhanced Fluid Recovery, Aggressive Fluid Vapor Recovery, and mobile biosparging (FPM, April 2022). Despite these activities, anerobic conditions persist and measurable light non-aqueous phase liquid (LNAPL) was 0.01 ft thick in MW-1-129 in May 2019 and 0.02 ft thick in MW-2R-129 in June 2020 (FMP, April 2022). LNAPL has not been observed in any well onsite since June 2020.

Groundwater sampling is conducted annually at monitoring well MW-1-129 (**Attachment 3**). In addition, water level data are collected from six active monitoring wells as summarized on **Table 1** and posted on **Figure 3**. As indicated on **Table 1**, the monitoring wells are relatively shallow (screened less than 16 ft bgs); however, the water table is above the top of the screened interval in each well. The general direction of groundwater flow is to the southeast. Naphthalene exceeded the South Carolina Risk-Based Screening Level (RBSL) of 25 micrograms per liter (µg/L) in MW-1-129 in the former UST location during the September 2023 groundwater sampling event. The naphthalene result was 62 µg/L using United States Environmental Protection Agency (USEPA) Method 8260D for volatile organic carbons (VOCs) and 32 µg/L using USEPA Method 8270E with selected ion monitoring (SIM) for PAHs as summarized in **Table 2**.

Since 2016, naphthalene has been analyzed by USEPA Method 8260D and earlier methods appropriate for VOCs. While naphthalene is generally considered a semi-volatile organic compound (SVOC), it is the most volatile of the PAHs and can be detected using VOC methods. The variation in naphthalene results between methods can be attributed to the greater analytical sensitivity of the SIM method that focuses on specific ions of interest, which can enhance detection limits and reduce background noise. Other factors could include the ionization efficiency of naphthalene under conditions used in the SIM method, calibration and quality control differences, the SIM method's ability at handling more complex matrices leading to more consistent results for semi-volatile compounds like naphthalene, and the chromatographic conditions that can affect the retention time and resolution of naphthalene, potentially leading to differences in quantitation. Furthermore, the data do not suggest that the VOC method is more precise than the SVOC method; however, there is a discrepancy in the concentration. The historical data for both methods, where available, are summarized in **Table 3**. All other analytical results during the September 2023 sampling event were either below South Carolina RBSLs or non-detect in both normal and duplicate (MW-01-129-a) samples. The laboratory reports are included in **Attachment 4**.

MW-1-129 had previously been used for remediation activities including passive skimmers, Vacuum Enhanced Fluid Recovery, Aggressive Fluid Vapor Recovery, and mobile biosparging (FPM, April 2022); therefore, groundwater monitoring data collected from this well may not be representative of the aquifer. The original well was over drilled to remove all well materials and then backfilled with grout. The well was replaced on 25 March 2024 (MW-1R-129). The replacement well was installed approximately 4 ft east of the original well (**Figure 2**) to an original depth of 16.0 ft bgs but heaved during the installation to an actual depth of 13.5 bgs. Coincidently, the screen interval of 3.5-13.5' bgs is less likely to be submerged than the original 6-16' bgs, therefore, this well depth may actually prove to be more effective in monitoring the contaminants of concern than the original depth. The well was constructed of 2-inch polyvinyl chloride (PVC) riser with 10 ft of 0.010-inch machine slotted screen. Well construction details are included in **Attachment 5**. . MW-1R-129 was developed on 9 April 2024. Note the development logs indicate the potential of hydrogen (pH) is unusually high, which suggests grout contamination despite the well having 2-ft thick bentonite seal. A potential explanation for this unusually high pH is that the abandonment of MW-1-129 occurred within approximately 4 ft of the new well and the abandonment required overdrilling which left a large diameter hole in the ground which was backfilled with a large volume of grout. It is reasonable to conclude the high pH value recorded in the water at MW-1R-129 was due to the large volume of grout required to

abandon MW-1-129 located in close proximity to the new well. Well development logs are included in **Attachment 3**.

MW-1R-129 was purged and sampled for naphthalene only on 18 April 2024. The naphthalene result was 150 µg/L using PAH USEPA Method 8270E SIM and 220 µg/L using VOC USEPA Method 8260D (**Table 2**). The VOC results were consistently higher than the PAH results in both the September 2023 and April 2024 sampling data. The results from replacement well MW-1R-129 indicate naphthalene concentrations in groundwater are higher than anticipated based on samples collected from MW-1-129 (**Figure 4**).

The field duplicate samples, denoted with "-A" after the field sample identification in **Table 2**, were collected during the September 2023 and April 2024 sampling events and were analyzed for naphthalene by USEPA Methods 8260D and 8270E SIM as summarized on **Table 2**. The relative percent difference between each set of data was within the 30 percent (%) threshold; therefore, the data are considered valid. Furthermore, the data do not suggest that the VOC method is more precise than the SVOC method; however, there is a discrepancy in the concentration. The lab and validation reports for both sampling events are available in **Attachment 4**.

The conceptual site model for this site recognizes that the UST and approximately 18 cubic yards of the immediate impacted soil were removed in 1991. Due to the shallow water table, which historically ranged from 1.65 feet bgs to 8.71 feet bgs and averages 3.5 feet bgs, groundwater was directly impacted. Groundwater remedial actions to date have eliminated LNAPL and reduced contaminants to below South Carolina RBSLs with the exception of naphthalene, which persists at concentrations that exceed the RBSL of 25 µg/L. Analytical results from samples collected from monitoring well MW-1-129, which was utilized during prior groundwater remedial actions, underestimated the amount of naphthalene present in the aquifer. Results from groundwater collected from replacement well MW-1R-129 (installed with 4.25-inch diameter auger) provide a more accurate estimate of the residual mass. Since naphthalene has a strong affinity to adsorb to soil (i.e., the organic carbon-water patrician coefficient [Koc] is approximately 1,000), dissolved phase naphthalene is present at equilibrium with the sorbed mass. As an SVOC, naphthalene does not readily volatize during air sparging. However, bioremediation enhanced through biosparging and bioaugmentation is an effective technology for desorption and degradation of naphthalene (USEPA, July 2014) and is proposed at site TU544 to complete the remedial action to achieve the South Carolina RBSLs.

## A6 Project/Task Description and Schedule

A focused biosparge (BSp) system is proposed to address the adsorbed naphthalene mass at the water table as well as the dissolved naphthalene concentrations in shallow groundwater with BSp wells designed specifically to deliver air to the remaining naphthalene mass. Ambient air will be injected into the groundwater below the naphthalene plume using an air compressor and injection wells. Increasing the dissolved oxygen (DO) will enhance aerobic bioremediation of the petroleum compounds by providing oxygen required by microorganisms to transform the organic contaminants into carbon dioxide, water, and microbial cell mass. Contact with contamination is key for this type of technology.

***Treatment System Installation Activities***

System installation will include the following subtasks:

- Completion of a SCDES Underground Injection Control (UIC) permit application
- Completion of an Air Force Form 332, Base Civil Engineering Work Clearance Request
- Conducting public/private utility locates to identify existing subsurface utilities/piping
- Installation of the proposed BSp wells
- Installation of the compressor and timer on the existing pad adjacent to MW-1R-129
- Installation of hoses connecting BSp wells with compressor

***BSp Well and Vapor Point Monitoring Design/Specifications***

Three, temporary vertical BSp wells will be installed using 4.25-inch diameter hollow stem augers for focused treatment of the remaining adsorbed and dissolved mass near MW-1R-129. The BSp well screen intervals will be 16 to 18 ft bgs, placing the top of the screen approximately 12 to 15 ft below the water table (depending on seasonal variations) and above the Cooper Marl confining clay layer.

The BSp wells will be installed on approximately 25-ft centers with each BSp well having a design radius of influence (ROI) of approximately 12 to 15 ft at the water table based on the depth of installation. BSp well locations are shown on **Figure 5**. Each BSp well will be drilled in the grass-covered area. The BSp well construction will be of 2-inch diameter PVC materials and consist of 2 ft of 0.010-inch slotted PVC screen and 16 ft of blank PVC riser. A 20/30 silica sand will be installed using tremie methods to approximately 1-foot above the well screen followed by a 5-foot thick bentonite seal. Upon adequate hydration, the remainder of the boring will be tremie grouted with bentonite-cement grout. The top of each BSp well will be completed with a threaded female well-head and male cap. Surface completions will consist of 12-inch diameter flush mount well vaults in concrete pads. Conveyance lines for connecting wells to the BSp compressor will be polyurethane compressed air hose laid on the ground and protected by construction fencing and/or traffic-rated cable ramps.

One vapor monitoring point (VMP-1-129) will be installed near Building 129, as shown on **Figure 5**, to monitor any vapor accumulations in the vadose zone. One boring will be hand augured to a depth of 2 ft. The vapor point will be constructed of 1-inch diameter PVC pipe and consist of 1 ft of 0.010-inch slotted PVC screen and 1 ft of blank PVC riser. A 20/30 silica sand will be installed around the screen and to 6-inches bgs. Hydrated bentonite chips will be placed in the annulus to surface.. A cone will be placed over the vapor point until its abandoned.

Upon completion of BSp wells and vapor point installation, SCDES Form 1903 will be submitted to document each well installed. A well-construction diagram will be prepared for inclusion in the report.

***Management of Soil Cuttings***

Per conversations with SCDES, soil cuttings may be spread on the ground since the impacted soil was removed during UST closure. However, it may be inappropriate to spread cuttings due to foot traffic or weather. At the discretion of the geologist, soil cutting may be placed in a 55-gallon drum, labeled indicating a sample is out for analysis (e.g., site name, contact information, and

date sampled), transferred to the non-hazardous drum storage area near Building 692 on Range Road, and staged on wood pallets or impervious material. A grab sample will be collected and analyzed for BTEX by USEPA Method 8260D and naphthalene by USEPA Method 8270E SIM. Total compound analysis is generally acceptable for off-site disposal of soils contaminated with petroleum constituents. Additional analyses, such as pH (USEPA Method SW9045D), reactivity (SW9012B), corrosivity (USEPA Method 9034), and ignitability (USEPA Method 1030) may be required by the disposal facility. Final IDW disposal documentation, including laboratory reports and waste manifests, will be provided in the reports summarizing the implementation of this work plan.

***BSp Equipment Setup and Operating Parameters***

An electric Gast® oil-less piston compressor (or equivalent) that can deliver 6 cfm at 50 pounds per square inch (psi) will be used to supply air to the BSp wells. The compressor will be connected to an existing ground fault circuit interrupter outlet located at AOC T and placed near the BSp wells inside of an outdoor deck storage box for rain protection. A pressure regulator, pressure gauge, and flow meter will be used to set the flow rate in each individual conveyance line. The total design pressure, including both hydrostatic head and friction losses in piping, is 7.8 psi for 2 cfm per well (**Table 4**). A BSp compressor will need to provide a minimum of 6 cfm at 7.8 psi or a total of 9.4 psi with a 20% safety factor. This type of compressor operates with very little maintenance on a continuous basis. The planned operating cycle for the compressor is 2 hours on and 1 hour off. A temporary security fence will be placed around the BSp well and the compressed air hose will be located outside of the wooden fence enclosure adjacent to Building 129 (**Figure 5**).

The BSp system, operating at 6 cfm, will deliver approximately 90 pounds of oxygen per day to the subsurface, on the operating cycle proposed above at 16 hours per day of injection. A maximum of three BSp wells can operate simultaneously with the proposed compressor. Additional BSp wells may be added during the optimization period, if needed, and operate in series with the proposed cycle schedule.

***System Startup and Bioaugmentation***

Following installation of the temporary wells, the compressor will be connected to each well with compressed air hose. During the first 2-hour cycle, the pressure regulator, pressure gauge, and flow meter assembly will be used to set the air flow to each BSp well.

BSp wells will be operated at a flow rate of approximately 2 cubic ft per minute (cfm) with an on/off cycle of 2 hours on and 1 hour off. Cycles will be controlled by a mechanical timer. The DO levels will be measured in MW-1R-129 daily for the first 3 days of operation to ensure that concentrations remain above 2 milligrams per liter (mg/L). Injection cycle times will be operated for a period of 2 months and adjusted as needed to maintain a DO concentration of 2 mg/L. Cycling of the BSp is intended to prevent continuous channeling of the air through the soil matrix, to generate a more even distribution of air.

Prior to system startup, DO concentrations and depth to water will be measured in MW-1R-129 to document baseline conditions. Additionally, VOC concentration will be measured with a photoionization detector (PID) at the vapor point to establish baseline conditions.

After startup operations are complete and DO concentrations in groundwater from MW-1R-129 have increased to approximately 2 mg/L in monitoring well MW-1R-129, a mixture of Petrox™ formulated specifically for diesel will be prepared and injected into the subsurface through the BSp wells. Petrox™ is a freeze-dried strain of *pseudomonas* species and nutrients and arrives at the site in bags ready for hydration in a drum or tank. A 55-gallon drum will be filled with approximately 50 gallons of potable water. Petrox™ will be added to the water and stirred thoroughly with a handheld paddle. Note that adding water to Petrox™ will result in insufficient mixing and hinder the hydration process. The microbes will hydrate for approximately 8 hours. After hydration, the biosparge system will be shut down and each BSp well will be opened at the well-head. The hydrated microbial solution will be divided between each of the three BSp wells and will be poured into each well using a bucket and funnel. The BSp well-heads will be closed and the biosparge system restarted. The sparge air will be used to inject the solution into the subsurface. The addition of the microbes is expected to be a one-time event as the microbes will be an augmentation for continued microbial reproduction.

***System Operation***

Once per day during the first 3 days of operation, DO concentrations and depth to water will be measured in MW-1R-129 to verify the BSp system is operating as designed. Gauge readings of injection pressure and flow rate, as well as a PID measurements from the vapor point, will also be documented once per day during the first 3 days of operation. DO concentrations, depth to water, injection pressure, flow rates, and vapor point concentration will be recorded once per week for the duration of system operation.

In the event PID measurements at the vapor point exceed the Permissible Exposure Limit for naphthalene of 10 parts per million (ppm), the system will be shut down until a Summa cannister can be provided by the laboratory. The system will be temporarily restarted, and a grab sample from VMP-1-129 will be collected in the Summa cannister using USEPA SOP LSASDPROC-307-R5 included in **Attachment 6**. The system will be shut down following sample collection until the results of TO-15 analysis are provided by the laboratory. Once it has been determined it is safe to do so, biosparging will resume. If the results indicate the vapors pose a potential threat to the occupants of the building, the system will remain off and alternate remedial strategies will be evaluated.

Following 2 months of system operation, the system will be shut down for performance monitoring. If results meet South Carolina RBSLs for two consecutive sampling events 90 calendar days apart, the system will be removed. If the results exceed RBSLs, the system will continue operation for an additional 2 months; optimization strategies will be reviewed if necessary.

A proposed schedule is summarized below:

| Activity | Organization | Days from QAPP Approval (Assuming 3/3/25) | Anticipated Start Date | Anticipated Completion Date |
|---|---|---|---|---|
| BSp well Installation | Bhate | +30 days through +31 days | 4/4/25 | 4/3/25 |
| BSp system operation | Bhate | +33 days through +94 days | 4/5/25 | 6/5/25 |

| Activity | Organization | Days from QAPP Approval (Assuming 3/3/25) | Anticipated Start Date | Anticipated Completion Date |
|---|---|---|---|---|
| Field Parameter Collection | Bhate | +33 days through +94 days | 4/5/25 | 6/5/25 |
| Performance Monitoring | Bhate | +108 days or two weeks after system is turned off | 6/19/25 | 6/19/25 |
| Quarterly Groundwater Sampling | Bhate | +200 days or three months after performance monitoring | 9/19/25 | 9/19/25 |
| Semi-Annual Reporting | Bhate | +290 days or three months after quarterly sampling | 11/18/25 | 12/18/25 |
| Re-start system and/or Optimization | Bhate | If required, prepare work plan addendum and implement | 11/18/25 | 2/18/26 |
| Quarterly Groundwater Sampling | Bhate | If required, three months after prior quarterly sampling | 12/19/25 | 12/19/25 |
| Quarterly Groundwater Sampling | Bhate | If required, three months after prior quarterly sampling | 3/19/26 | 3/19/26 |
| Semi-Annual Reporting | Bhate | If required, three months after last quarterly sampling | 6/19/26 | 6/19/26 |

***Performance Monitoring***

Two weeks after ceasing the operation of the BSp system, performance monitoring will be conducted to evaluate the efficacy of the remedy. Performance monitoring will be conducted at monitoring wells MW-1R-129, MW-2R-129, and MW-5-129 for sampling completeness. The groundwater samples will be analyzed for naphthalene as outlined in UST Annual Contractor Quality Assurance Plan (ACQAP; Bhate, February 2024). Field measurements including DO will allow for evaluation of the ROI.

Groundwater monitoring will be performed in accordance with the *Quality Assurance Program Plan For The Underground Storage Tank Management Division (*South Carolina Department of Health and Environmental Control [SCDHEC], July 2020). Groundwater monitoring will commence 3 months after completion of BSp operation and be completed quarterly at three monitoring wells (MW-1R-129, MW-2R-129, and MW-5-129) (**Figure 5**) for a minimum of two sampling events. The groundwater samples will be analyzed by USEPA Method 8260D for BTEX and by USEPA Method 8270E SIM for naphthalene. Corrective Action System Evaluations (CASE) reports will be submitted on a semi-annual basis.

***Management of Purge Water***

Purge water will be stored in a 55-gallon drum staged in the non-hazardous drum storage area near Building 692 on Range Road and labeled indicating a sample is out for analysis (e.g., site name, contact information, and date sampled). For aqueous IDW generated during groundwater sampling, a summary table with the highest concentrations detected at each well will be used to determine the disposition of liquid IDW. In addition to BTEX (USEPA Method 8260D) and

naphthalene (USEPA Method 8270E SIM), the summary table should include pH (field measurement), chemical oxygen demand (Standard Method [SM]5220D), and biological oxygen demand (SM5210B). Although no hazardous waste is anticipated for activities at JBCA, Bhate will coordinate with the JBCA Hazardous Waste Program Manager to determine the proper disposal (e.g., non-hazardous or hazardous). Upon review and approval of the analytical data, the Base will coordinate with the City of North Charleston public works to approve discharge of IDW into the on-Base sewer located south of Building 692. No profile is required for IDW from groundwater development and sampling events.

***Reporting***

The analytical results will be presented in semiannual CASE reports. Additional details on groundwater monitoring, including recommended analysis and method numbers, are presented in Section B1 of the UST ACQAP Addendum (Bhate, February 2024).

In accordance with the Programmatic QAPP for the UST Management Division (SCDES, July 2020), No Further Action (NFA) decisions will be issued by the UST Management Division for UST releases where additional Site Rehabilitation actions are not required. An NFA is issued for release sites where each groundwater contaminant has decreased to the respective RBSL and post-remediation monitoring verifies the contaminants are below RBSLs for two consecutive sampling events.

Once the NFA is decision is made, a site restoration work plan will be prepared and implemented. During site restoration, monitoring wells will be abandoned in accordance with the well standards specified in South Carolina Regulation 61-71. Per the regulation, the pad, vault, and cover will be removed and the space filled with soil to level with the surrounding land surface. Bentonite-cement will be injected via tremie pipe starting at the bottom of the well and proceeding to the surface in one continuous operation. SCDES Form 1903 will be submitted for each well that is abandoned.

## A7 DATA QUALITY OBJECTIVES (DQOS)

This Addendum supplements what has been provided in the UST ACQAP Addendum (Bhate, February 2024) based on the UST Division Programmatic QAPP Guide (SCDHEC, July 2020) on the DQO Process and is described below.

| | | |
|---|---|---|
| 1 | State the Problem | The Site is the location of a former 500-gallon diesel fuel UST which was removed from the south side of Building 129 in June 1991. The UST was used to supply diesel fuel to an emergency generator. A UST Closure Report prepared by D&S Services in 1991 documented the UST system removal activities (Air Force Center for Environment Excellence [AFCEE], June 1995). Inspection upon removal identified a small hole near the bottom of the tank. Approximately 18 cubic yards of soil were removed from the excavation pit beneath and along each side of the UST. Soil samples from the excavation indicated that additional site characterization was needed. A new 1,000-gallon aboveground storage tank was installed near the location of the former UST pre-1996.<br>Naphthalene continued to exceed the South Carolina RBSL of 25 µg/L in MW-1-129 in the former UST location. MW-1-129 was replaced (MW-1R-129), purged and sampled for naphthalene only on 18 April 2024. The PAH naphthalene result was 150 µg/L and the VOC naphthalene result was 220 µg/L. The VOC results were consistently higher than the PAH results in both the September 2023 and April 2024 |

| | | |
|---|---|---|
| | | sampling events. The results indicate naphthalene concentrations are higher than expected and remedial action is required. The criteria for achieving No Further Action under the State UST Program is two consecutive quarters (or two sampling events more than 90 days apart) with all groundwater contaminants below RBSLs. When closure criteria have been met, a Well Abandonment Work Plan will be submitted to SCDES for concurrence. Upon concurrence, remaining monitoring wells will be abandoned. |
| 2 | Identify the Goals of the Study | The goals of this study/remediation are to operate a biosparge system via specifically designed biosparge wells to create aerobic conditions, with bioaugmentation via the biosparge wells. This will be followed by system operation for approximately 60 days. Groundwater samples will then be collected quarterly from three wells to monitor aquifer conditions until concentrations are below South Carolina RBSLs for two consecutive quarters to achieve NFA determination and Site Closeout. |
| 3 | Identify Inputs to the Study | **Biosparge** – Groundwater field parameters will be collected including temperature, pH, DO, oxidation reduction potential (ORP), specific conductance, and turbidity. Field parameters will be monitored daily for the first three days and then weekly for the next two months while the system is in operation.<br>**Bioaugmentation** - Once DO greater than 2 mg/L is achieved, inject Petrox™ culture into biosparge wells.<br>**Performance Monitoring** - Collect groundwater samples from MW-1R-129, MW-2R-129, and MW-5-129. Currently, only MW-1R-129 is sampled; adding other existing wells for completeness. |
| 4 | Define Site Boundaries | The anticipated area of investigation will be confined to the shallow groundwater in the grassy area southeast of Building 129 (**Figure 5**). Groundwater at the site is approximately 3.5 ft below top of casing and the vertical extent of contamination is anticipated to be no deeper than approximately 14 ft bgs. Biosparge wells will be screened at depth of approximately 16-18 ft bgs or just above the confining unit in order to obtain the largest ROI at the water table. There are significant underground utility concerns. A third-party ground penetrating radar (GPR) subcontractor will be used in conjunction with the Dig Permit process. This approach does not require removal of the existing pad on site. |
| 5 | Analytical Approach/ Decision Rule (Develop the Analytic Approach) | • Groundwater analysis will include BTEX and naphthalene by USEPA Method 8260D and naphthalene by USEPA Method 82670E SIM.<br>• Groundwater field parameters will also be collected including temperature, pH, DO, ORP, specific conductance, and turbidity.<br>• Vapor monitoring will be conducted via a vapor point placed between the biosparge wells and the building with a PID to evaluate potential for vapor intrusion. If PID readings are elevated (e.g., greater than 10 ppm), a sample will be collected using a Summa cannister and analyzed for VOCs by USEPA Method TO-15. |

| | | |
|---|---|---|
| 6 | Specify Performance and Acceptance Criteria | The performance and acceptance criteria will support No Further Action criteria.<br>• The Program QA/QC Manager or designee will verify field procedures are properly followed through field audits; any deviations will be promptly communicated, addressed, and documented.<br>• Analytical laboratories will carry current Department of Defense (DoD) Environmental Laboratory Accreditation Program certification and South Carolina required accreditations; laboratory accreditation is documented in the 2024 ACQAP (Bhate, February 2024) and will be provided upon request.<br>• Turbidity will be less than 10 Nephelometric Turbidity Units or the well will be redeveloped and sampled.<br>• Groundwater data will be compared to the South Carolina RBSLs. |
| 7 | Develop the Plan for Obtaining Data | Three biosparge wells will be installed. The wells will be on 25-foot centers with an anticipated 15 ft ROI; overlap at the water table. The screened interval will be 16-18 ft bgs to maximize the ROI. Utility clearance will be required including both private GPR and dig permit. The wooden privacy fence onsite can be worked around. A vapor monitoring point will be installed using a hand auger to 2 ft bgs and will consist of 1 ft of screen and 1 ft of riser. A mobile biosparge unit will be installed which requires 110 Volt electrical service. The electrical lines run across the ground. A temporary fence may be installed to protect the system. |

## A8 TRAINING AND CERTIFICATION

### *Training*

All personnel will have training and documentation in accordance with the JBCA Basewide Accident Prevention Plan (Bhate, September 2023). All personnel will have a minimum of the 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) training and subsequent 8-hour refreshers, when applicable. Personnel will also have first aid, cardiopulmonary resuscitation (CPR), and bloodborne pathogen training.

| Personnel | 40-hour OSHA HAZWOPER | 8-hour OSHA HAZWOPER Refreshers | CPR/First Aid/Bloodborne Pathogens |
|---|---|---|---|
| Caitlin Ryan | ✓ | ✓ | ✓ |
| Phil Bambach | ✓ | ✓ | ✓ |

### *Laboratory Certification*

Full Name of the Laboratory (analyses in Attachment 4): Pace Analytical Services, LLC
Name of Lab Director: Sudhip Pradham
Laboratory ID: 32010
SCDES Certification Number 32010001 SCDES Certification Expiration: 5/12/2027
Laboratory Contact Information:
Pace Analytical Services, LLC – Kathy Smith
106 Vantage Point Drive
West Columbia, South Carolina 29172
(803) 791-9700

Kathy.Smith@pacelabs.com

Full Name of the Laboratory (future analyses): Pace Analytical National Center

Name of Lab Director: Chris Johnson

Laboratory ID: 32010

SCDES Certification Number: 84004002 SCDES Certification Expiration: 6/30/24; extended by administrative review of application by SCDES on 10/23/24

Laboratory Contact Information:

Pace National – Ruth Welsh, Project Manager

Mt. Juliet, Tennessee

T: 412-209-8995

Ruth.Welsh@pacelabs.com ***Laboratory Standard Operating Procedures***

Laboratory Standard Operating Procedures (SOPs) are provided as Appendix E in the 2024 ACQAP (Bhate, February 2024) and may be provided with this addendum at the request of SCDES.

## A9 Documents and Records

***Personnel will receive the most current version of the QAPP Contractor Addendum via:***

***(Check all that apply)***

____FedEx ____Courier ____Hand delivered ✓ **- Electronically** Other

The following table provides a list of records and how they will be retained, stored, and archived.

**TABLE 2A RECORD IDENTIFICATION, STORAGE, AND DISPOSAL**

| Record | Produced By | Hardcopy/ Electronic | Storage Location For how long? | Archival |
|---|---|---|---|---|
| Field Notes/ Field Forms/ Logbook | Bhate | Hardcopy/ Electronic; field forms are completed electronically | Bhate, Birmingham, Alabama Minimum of 5 years | United States Air Force (USAF) Administrative Record (AR) |
| Chain-of-Custody forms | Bhate | Hardcopy/ Electronic | Bhate, Birmingham, Alabama Minimum of 5 years | USAF AR |
| Raw laboratory data package | Pace Analytical, South Carolina and Pace National, Tennessee | Electronic | Bhate, Birmingham, Alabama Minimum of 5 years | USAF AR |
| Audit/assessment checklists/reports | Bhate/Pace Analytical, South Carolina and Pace National, Tennessee | Electronic | Bhate, Birmingham, Alabama Minimum of 5 years | USAF AR |
| Work Plans | Bhate/ Synectics | Hardcopy/ Electronic | Bhate, Birmingham, Alabama Minimum of 5 years SCDES, Columbia, South Carolina Minimum of 5 years | USAF AR SCDES |
| Key Correspondence | Bhate/USAF USAF/SCDES | Electronic | Bhate, Birmingham, Alabama Minimum of 5 years | USAF AR SCDES |
| Validated data | Bhate/Synectics | Electronic | Bhate, Birmingham, Alabama Minimum of 5 years | USAF AR |
| CASE Reports | Bhate | Hardcopy/ Electronic | Bhate, Birmingham, Alabama Minimum of 5 years; SCDES, Columbia, South Carolina Minimum of 5 years | USAF AR SCDES |

# REFERENCES

AFCEE. June 1995. *Statement of Work (SOW) for Site Characterization at Buildings 401, 551, 1595, 129, 900, 1800 and AAFES Shoppette and Site Restoration Via Soil Ventilation and Air Sparging at AAFES Shoppette Located Charleston Air Force Base, South Carolina*

Bhate. February 2024. *2024 Annual Contractor Quality Assurance Plan (SCDHEC UST Program), Joint Base Charleston – Air, South Carolina*.

Bhate. September 2023. *Final Revision 1, Basewide Accident Prevention Plan, Optimized Remediation Contract, Joint Base Charleston – Air.* (Appendix A of the *Basewide Uniform Federal Policy – Quality Assurance Project Plan, Optimized Remediation Contract, Joint Base Charleston – Air, South Carolina* [Bhate, January 2024]).

FPM. April 2022. *Semiannual Corrective Action System Evaluation (CASE) Review, AOC T (TU544) Building 129. Joint Base Charleston – Air, South Carolina.*

SCDHEC. July 2020. *Quality Assurance Program Plan For The Underground Storage Tank Management Division.*

USEPA Laboratory Services & Applied Science Division. April 2023. *Groundwater Sampling.* LSASDPROC-301-R6.

USEPA. July 2014. *Scoping and Problem Formulation for the Identification of Potential Health Hazards for the Integrated Risk Information System (IRIS) Toxicological Review of Naphthalene.*

# SECTION B: MEASUREMENT/DATA ACQUISITION

## B1 SAMPLING PROCESS/EXPERIMENTAL DESIGN

The project schedule is provided in the table below.

**TABLE 3A SAMPLING ACTIVITIES**

| Task | Frequency | Start Date | End Date | Comments |
|---|---|---|---|---|
| Groundwater Sampling | Quarterly, until concentrations are below South Carolina RBSLs for two consecutive quarters | March 2025 | To Be Determined | Initial performance monitoring sampling and then followed by quarterly sampling |

## B2 SAMPLING METHODS

| Event | Matrix | Sampling Method | Number of Wells to be Sampled/ Well ID(s) | QA/QC Samples |
|---|---|---|---|---|
| Site-wide sampling to verify CSM | Aqueous (groundwater) | Low-flow groundwater sampling (LSASDPROC-301-R6; USEPA, April 2023) | MW-1R-129<br>MW-2R-129<br>MW-5-129 | Field Blank: Daily<br>Field Duplicates: 5%<br>MS/MSD: 5%<br>Trip Blanks: 1 Per Cooler<br>Reusable sampling equipment will not be used. Should a reusable sampling device be used, an equipment blank is required to be collected for each day of use. |
| Notes: % - percent, MS/MSD – matrix spike/matrix spike duplicate | | | | |

**The samples will be:** __✓__ Grab____Homogenized ____Split

Discrete, grab groundwater samples will be collected from monitoring wells using the low-flow purge method in accordance with the ACQAP (Bhate, February 2024), which references standard operating procedure LSASDPROC-301-R6 (USEPA, April 2023). A peristaltic pump with new polyethylene tubing will be used to purge and sample groundwater.

Should issues be encountered in the field, they should be resolved and the corrective action should be documented as indicated in the table below.

**TABLE 4A FIELD CORRECTIVE ACTION**

| Failure | Response | Documentation | Individual Responsible |
|---|---|---|---|
| Field Equipment | Notify Bhate PM and replace equipment | Daily Field Log | Caitlin Ryan/Bhate Field Staff |
| Safety Issues | Proceed in accordance with the Base Accident Prevention Plan and notify Bhate PM and Bhate H&S Manager, when applicable | Daily Field Log | Caitlin Ryan or Phil Bambach/Bhate Field Staff |
| Access Issues | Notify Bhate PM and contact JBCA RPM | Daily Field Log | Caitlin Ryan/Bhate Field Staff |
| Wells Not Found | Geographical Information System (GIS) Coordinates<br>Metal detector and measurements from known points if needed and notify Bhate PM | Daily Field Log | Caitlin Ryan/Bhate Field Staff |
| Sampling Issues | Notify Bhate PM and follow SOP corrective action. May need to re-sample. | Daily Field Log | Caitlin Ryan/Bhate Field Staff |

## B3 SAMPLE HANDLING AND CUSTODY

1. How will the samples get from the Site to the Lab to ensure holding requirements are met? Samples will be packed on ice and sent via FedEx overnight, direct delivery from Bhate personnel to the lab, or lab personnel will pick up.
2. If sample preservation procedures differ from the UST Programmatic QAPP, please provide details. No revisions required.
3. If chain of custody procedures differ from the UST Programmatic QAPP, please provide details. No revisions required.

## B4 ANALYTICAL METHODS

BTEX and naphthalene will be analyzed using USEPA Method 8260D in accordance with the UST Programmatic QAPP. Based on the logic presented in Section A5, naphthalene will also be analyzed using USEPA Method 8270E SIM.

1. Identify the method which the SOP references and the equipment or instrumentation that is needed:

**TABLE 5A ANALYTICAL SOPS AND REFERENCED METHODS**

| PARAMETER | METHOD REFERENCED | EQUIPMENT/ INSTRUMENTATION | LABORATORY SOP |
|---|---|---|---|
| BTEX/ Naphthalene | 8260D | Gas Chromatograph / Mass Spectrometer | ENV-SOP-WCOL-0107 |
| Naphthalene | 8270E SIM | Gas Chromatograph / Mass Spectrometer | ENV-SOP-WCOL-0102 |

2. Provide SOPs for the Kerr Method or the Ferrous Iron Method if these are parameters for this study. This can be attached or written here. If attached, please note that it is an attachment and where it is located (if applicable). Not Applicable.

## B5 Quality Control Requirements

All QC will follow the requirements laid out in Section B5 of the UST Programmatic QAPP.

## B6 Field Instrument and Equipment Testing, Inspection, and Maintenance

The table below identifies the field equipment needing periodic maintenance, the schedule for this, and the person responsible.

**Table 6A Instrument and Equipment Maintenance**

| Instrument | Serial Number | Type of Maintenance | Frequency | Person responsible |
|---|---|---|---|---|
| Sampling Equipment (PIDs, water quality meters, pumps, etc.) | To be determined (Rental) | To be completed by the rental company | As required per the manufacturer's instructions | Rental company<br>If equipment fails, the rental company will replace it. |

## B7 Instrument Calibration and Frequency

The table below identifies the calibration criteria, the schedule for this, how deficiencies should be resolved, and the person responsible for corrective action.

**Table 7A Instrument Calibration Criteria and Corrective Action**

| Instrument | Serial Number | Frequency of Calibration | Calibration Procedure and Documentation | Acceptance Criteria | Corrective Action | Person Responsible |
|---|---|---|---|---|---|---|
| PID<br>Water Quality Meters | To be determined (Rental) | Daily (start and end of day) | Per manufacturer's instructions/ Calibration Form and Field Log Book | Per manufacturer's instructions | If re-calibration does not fall within the acceptance criteria, the meter will need to be replaced. | Field Staff will coordinate with the rental company for assistance or replacement and notify the PM. |

## B8 Inspection/Acceptance Requirements for Supplies and Consumables

1. The procedures for storage, handling or transport of supplies/consumables will be consistent with the UST Programmatic QAPP.

## B9 Data Acquisition Requirements (Non-Direct Measurements)

This section discusses data that was not generated by this project.

**Table 8A Non-Direct Measurements**

| Data Source | Used for | Justification for use in this project | Comments |
|---|---|---|---|
| Historical documents from the Administrative Record | CSM development/updates, historical laboratory results, and well construction details (including GIS data) | Required data to develop accurate CSM and remediation effectiveness assessment | It is assumed that information provided in the ERPIMS database and documents stored in the Administrative Record are correct |

## B10 Data Management

Synectics Inc., will provide event planning, QA oversight, electronic data management, data validation, and Environmental Resources Program Information Management System (ERPIMS) submittals. The data management procedures outlined in the ACQAP (Bhate, February 2024) will be followed for this site-specific work plan.

# SECTION C: ASSESSMENT AND OVERSIGHT

## C1 ASSESSMENT AND RESPONSE ACTIONS

1. The Contractor is supposed to observe field personnel daily during sampling activities to ensure samples are collected and handled properly and report problems to SCDES within 24 hours. Please state who is responsible for doing this, what observations will be made, and how those observations will be made. Will this person have the authority to stop work if severe problems are seen?

   The field leader (Caitlin Ryan) will be responsible for observing sampling activities and reporting any issues to the Bhate ORC PM. The Bhate ORC PM will notify USACE/JBCA and JBCA will notify SCDES within 24 hours. All field staff and subcontractors have stop work authority and will notify the field leader of any issues observed.

2. The SCDHEC UST Programmatic QAPP states that the Lab will receive an Off-site Technical System Audit. For this project, what assessments will be done by the Contractor on the Commercial Lab(s) that are being used—other than their certification audit? When or how often are these done? Who will the results be given to and who has the ability to stop work if problems are severe?

   The Laboratory is audited by clients, the DoD Environmental Laboratory Approval Program, and the National Environmental Laboratory Accreditation Conference (NELAC). DoD and NELAC audits are conducted a minimum of every 2 years. Client audits do not have a schedule, but typically occur at the beginning of certain projects followed by periodic audits as needed. The results of these audits are provided to the Laboratory. Client audits are made available to the Laboratory and appropriate staff within the client's organization. The Laboratory Director and QA Officer have the ability to stop work if problems are severe. Desk audits of laboratory SOPs, method detection limits, and demonstration of capability are performed by SCDES annually. The Bhate Program Chemist shall be responsible for conducting thorough reviews of the data and evaluating its accuracy, precision, and usability for the project.

## C2 REPORTS TO MANAGEMENT

The procedures outlined in the ACQAP (Bhate, February 2024) will be followed for this site-specific work plan.

## SECTION D: DATA VALIDATION AND USABILITY

The data validation and usability procedures and criteria outlined in the ACQAP (Bhate, February 2024) will be followed for this site-specific work plan.

# FIGURES


# AOC T (TU544) Site Map

**Figure 2**

Site Specific Work Plan and Groundwater Monitoring Report
for AOC T (TU544) UST 16344
Joint Base Charleston - Air, South Carolina

DRAWN BY: MRM

DATE: 1/14/2025

SCALE: As Shown

PROJECT NO: SAS2300.1000.02.31AA

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# AOC T (TU544) Potentiometric Surface (September 2023)

**Figure 3**

0 15 30 Feet

N

128

129

130

AOC T (TU544) Boundary

MW-1-129 (34.34)

MW-1R-129 (NM)

MW-5-129 (34.66)

MW-10-129 (34.10)

MW-2-129

MW-2R-129 (33.66)

MW-8-129

MW-7-129 (35.05)

MW-6-129

MW-3-129

MW-4-129 (33.59)

MW-9-129

35.00

34.00

33.00

S GRAVES AVE

Acronyms:
AOC - Area of Concern
AST - Aboveground Storage Tank
UST - Underground Storage Tank
NM - Not Measured

Aerial Photography Source: JBC, GeoBase/ESO, March 2023

**Legend:**

- Monitoring Well Location
- Abandoned Monitoring Well Location
- (34.34) Potentiometric Surface Elevation North American Vertical Datum (NAVD88)
- Potentiometric Surface Contour (Dashed Where Inferred)
- Approximate Groundwater Flow Direction
- Existing AST Location
- Former 1,000-Gallon Diesel AST Location
- Approximate Former UST Location
- Project Site Boundary

Site Specific Work Plan and Groundwater Monitoring Report
for AOC T (TU544) UST 16344
Joint Base Charleston - Air, South Carolina

PROJECT NO: SAS2300.1000. 02.31AA

SCALE: As Shown

DATE: 1/14/2025

DRAWN BY: MRM

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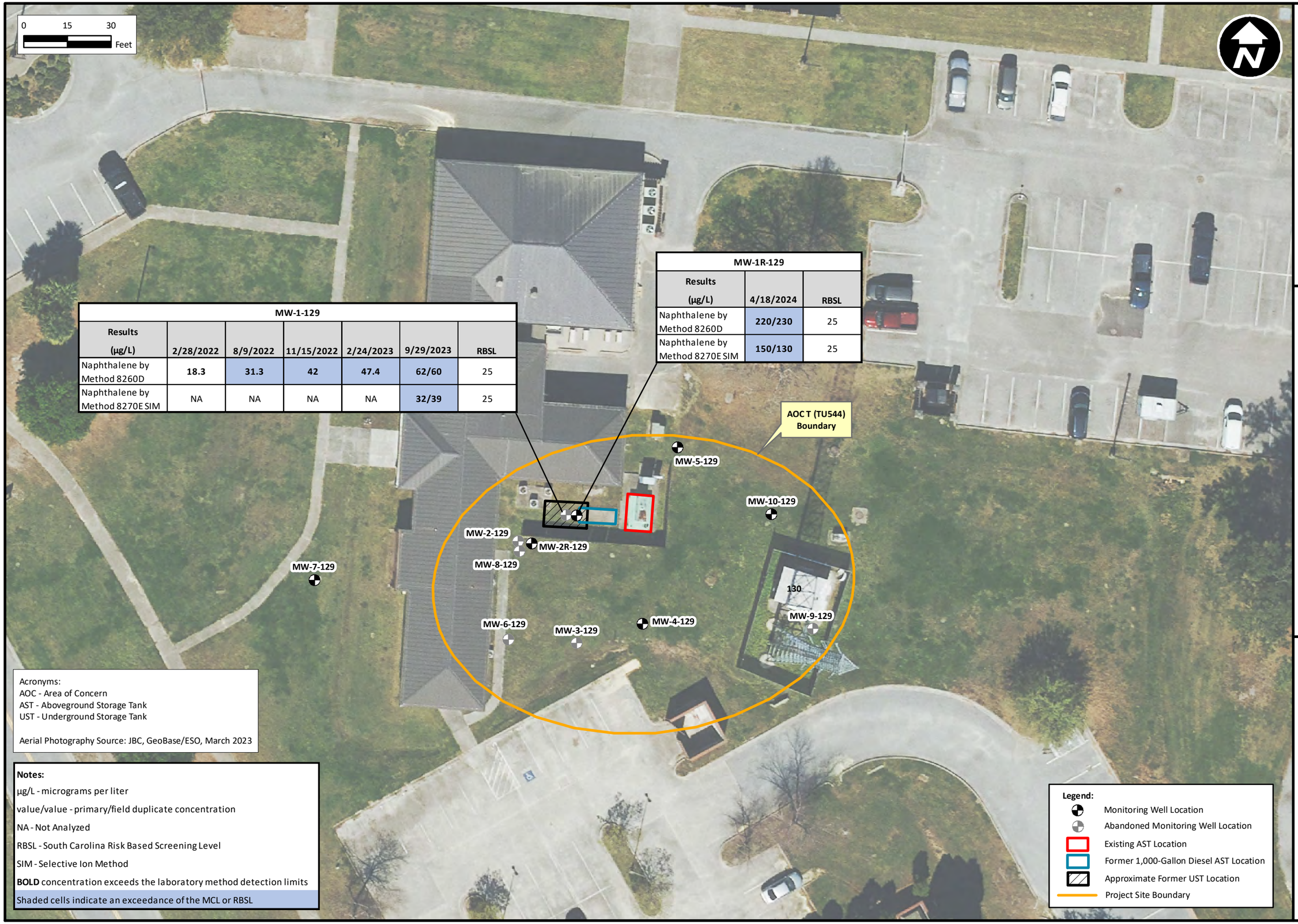


# AOC T (TU544) September 2023 and April 2024 Groundwater Sampling Data

**Figure 4**

Site Specific Work Plan and Groundwater Monitoring Report
for AOC T (TU544) UST 16344
Joint Base Charleston - Air, South Carolina

DRAWN BY: MRM

DATE: 1/21/2025

SCALE: As Shown

PROJECT NO: SAS2300.1000. 02.31AA

bhate

www.bhate.com

# AOC T (TU544) Biosparge Well Locations

**Figure 5**

Site Specific Work Plan and Groundwater Monitoring Report
for AOC T (TU544) UST 16344
Joint Base Charleston - Air, South Carolina

DRAWN BY: MRM

DATE: 1/14/2025

SCALE: As Shown

PROJECT NO: SAS2300.1000.02.31AA

www.bhate.com

VMP-1-129
MW-1-129
MW-1R-129
BS-1-129
BS-2-129
MW-2-129
MW-2R-129
MW-8-129
BS-3-129
MW-4-129
129
0 7.5 15 Feet

AOC T (TU544) Boundary
MW-5-129
MW-10-129
MW-7-129
MW-6-129
MW-3-129
128
130
MW-9-129
S GRAVES AVE

Legend:
- Proposed Biosparge Well Location
- Proposed Vapor Monitoring Point
- Monitoring Well Location
- Abandoned Monitoring Well Location
- Existing AST Location
- Former 1,000-Gallon Diesel AST Location
- Approximate Former UST Location
- Proposed Temporary Chain Link Fence
- Project Site Boundary

Acronyms:
AOC - Area of Concern
AST - Aboveground Storage Tank
UST - Underground Storage Tank

Aerial Photography Source: JBC, GeoBase/ESO, March 2023

0 15 30 Feet

# TABLES

**Table 1**
**Monitoring Well Construction Details and Groundwater Level Measurements (September 2023)**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston - Air, South Carolina**

| Location | Northing (ft NAD 83) | Easting (ft NAD 83) | Elevation (ft NAVD 88) | Reported Well Depth (feet btoc) | Screen Interval (ft btoc) | Depth to Water (ft btoc) | Date Measured | Groundwater Elevation (ft NAVD 88) |
|---|---|---|---|---|---|---|---|---|
| MW-1-129 | 388,223.3913 | 2,290,854.5253 | 36.64 | 15.91 | 6-16 | 2.30 | 9/29/2023 | 34.34 |
| MW-2R-129-1 | 388,210.4500 | 2,290,833.5000 | 35.96 | 14.8 | 4.3-14.3 | 2.30 | 9/29/2023 | 33.66 |
| MW-4-129 | 388186.1442 | 2290880.7645 | 36.23 | 16.5 | 6-16 | 2.64 | 9/29/2023 | 33.59 |
| MW-5-129 | 388246.6423 | 2290892.8636 | 36.42 | 16.5 | 6-16 | 1.76 | 9/29/2023 | 34.66 |
| MW-7-129 | 388201.0410 | 2290768.0660 | 36.17 | 15.5 | 5-15 | 1.12 | 9/29/2023 | 35.05 |
| MW-10-129 | 388223.7911 | 2290925.0846 | 36.10 | 14.30 | 3.81-13.81 | 2.00 | 9/29/2023 | 34.10 |

Notes:

btoc - below top of casing

ft - feet

NAD 83 - North American Datum of 1983; National Adjustment of 2011

NAVD 88 - North American Vertical Data of 1988

NA - Not available, well had not yet been surveyed at the time of this report

**Table 2**
**Groundwater Monitoring Results (September 2023 and April 2024)**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston Air, South Carolina**

| **Location ID:** | | MW-1-129 | | MW-1R-129 | |
|---|---|---|---|---|---|
| **Field Sample ID:** | | MW-1-129_0923 | MW-1-129_0923-a | TU544_MW-1R-129_0424 | TU544_MW-1R-129_0424-a |
| **Lab Sample ID:** | | YI30001-017 | YI30001-018 | ZD22015-001 | ZD22015-002 |
| **Sample Date:** | | 9/29/2023 | 9/29/2023 | 4/18/2024 | 4/18/2024 |
| **Sample Type:** | | N | FD | N | FD |
| **Sample Depth Interval (feet):** | | 6.00 - 16.00 | 6.00 - 16.00 | 3.50 - 13.50 | 3.50 - 13.50 |
| **VOCs by Method 8260D (µg/L)** | **RBSL** | | | | |
| Naphthalene | 25 | **62** | **60** | **220** | **230** |
| **PAHs by Method 8270E SIM (µg/L)** | **RBSL** | | | | |
| Naphthalene | 25 | **32** | **30** | **150** | **130** |
| **Field Parameters** | | | | | |
| Temperature (degrees Celcius) | NV | 22.3 | 22.3 | 19.5 | 19.5 |
| Dissolved Oxygen (mg/L) | NV | 0.25 | 0.25 | 0.15 | 0.15 |
| pH (standard units) | NV | 5.87 | 5.87 | 10.6 | 10.6 |
| ORP (mVolts) | NV | -46.3 | -46.3 | -260 | -260 |
| Specific Conductance (mS/cm) | NV | 0.107 | 0.107 | 0.181 | 0.181 |
| Turbidity (NTUs) | NV | 1.69 | 1.69 | 6.76 | 6.76 |

**Notes:**

**Detected analytes are in bold**

Results highlighted in blue exceed the RBSL.

AOC = Area of Concern

FD = Field Duplicate

MCL = Maximum Contaminant Level

N = Normal Environmental Sample

NA = Not Analyzed

NV = No Value

PAH = Polycyclic Aromatic Hydrocarbons

RBSL = South Carolina Risk Based Screening Level

VOC = Volatile Organic Compound

Non-detect values are reported to the Limit of Detection or Limit of Quantitation, as defined during data validation.

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.) 106 Vantage Point Drive West Columbia, SC 29172

**Units:**

µg/L = micrograms per liter

mg/L = milligrams per liter

mS/cm - milliSiemens per centimeter

mV = milliVolt

NTUs = Nepthalmetric Turbidity Units

**Table 3**
**Historical Groundwater Monitoring Data**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston Air, South Carolina**

| Location ID: | | MW-1-129 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Sample ID: | | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 |
| Lab Sample ID: | | J1100784-002 | 21205031302 | 21304114904 | FA21793-4 | FA36254-6 | FA44581-7 | FA48060-9 | FA49907-8 | FA52436-3 | FA55076-6 | FA57983-4 |
| Sample Date: | | 2/21/2011 | 5/2/2012 | 4/10/2013 | 1/29/2015 | 8/16/2016 | 6/2/2017 | 9/25/2017 | 12/5/2017 | 3/13/2018 | 6/14/2018 | 9/25/2018 |
| Sample Type: | | N | N | N | N | N | N | N | N | N | N | N |
| Sample Depth Interval (feet): | | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 |
| **VOCs by Method 8260D (µg/L)** | **MCL** | | | | | | | | | | | |
| Benzene | 5 | **0.96** | **0.285** | 0.111 U | 0.5 U | **0.38** | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | 700 | **22** | **1.9** | **2.46** | **11.8** | **34.3** | NA | NA | NA | NA | NA | NA |
| m,p-Xylene | NV | **33** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methyl tert-butyl ether (MTBE) | NV | 0.14 U | 0.06 U | 0.078 U | 0.5 U | 0.5 U | NA | NA | NA | NA | NA | NA |
| Naphthalene | 25* | **130** | **52.6** | **34.8** | **91.4** | **145** | **172** | **122** | **80.3** | **62.9** | **103** | **77.4** |
| o-Xylene | NV | **9.4** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | 1,000 | **0.49** | 0.127 U | 0.122 U | 0.5 U | 0.5 U | NA | NA | NA | NA | NA | NA |
| Xylenes, Total | 10,000 | NA | **8.16** | **3.89** | **21.9** | **23.2** | NA | NA | NA | NA | NA | NA |
| **PAHs by Method 8270E SIM (µg/L)** | **MCL** | | | | | | | | | | | |
| 1-Methylnaphthalene | NV | **86** | **0.408** | **34** | **31.1** | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | NV | **96** | **0.446** | **22** | **33.2** | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthene | NV | **3.2** | **0.985** | **3.9** | **1.6** | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | NV | 0.077 U | 0.07 U | **0.692** | 0.43 U | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | NV | 0.077 U | 0.024 U | 0.02 U | **0.32** | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | NV | 0.068 U | 0.059 U | **0.107** | 0.043 U | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 0.2 | 0.055 U | 0.023 U | **0.05** | 0.043 U | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NV | 0.069 U | 0.018 U | 0.0043 U | 0.043 U | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | NV | 0.064 U | 0.036 U | **0.079** | 0.043 U | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NV | 0.077 U | 0.039 U | **0.075** | 0.043 U | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | NV | 0.074 U | 0.018 U | **0.218** | 0.087 U | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | NV | 0.058 U | 0.035 U | **0.09** | 0.043 U | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | NV | 0.089 U | 0.04 U | **0.151** | 0.43 U | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | NV | **5.8** | **0.204** | **5.31** | **3.4** | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-c,d)pyrene | NV | 0.063 U | 0.04 U | **0.073** | 0.043 U | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 25* | **84** | **4.41** | **14.1** | **37** | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NV | **5.4** | 0.028 U | **4.32** | **3.5** | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | NV | **0.096** | **0.305** | **0.232** | 0.43 U | NA | NA | NA | NA | NA | NA | NA |

**Units**
µg/L = micrograms/Liter

**Notes**
FD = Field Duplicate
ID = Identification
MCL = Maximum Contaminant Level
N = Normal Environmental Sample
NA = Not Analyzed
NV = No Value
PAH = Polycyclic Aromatic Hydrocarbon
*RBSL = Risk Based Screening Level

**Detected analytes are indicated in bold.**
Results highlighted in grey exceed the MCL
Results highlighted in blue exceed the RBSL

**Qualifier**
U = Undetected: The analyte was analyzed for but not detected.

**Table 3**
**Historical Groundwater Monitoring Data**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston Air, South Carolina**

| Location ID: | | MW-1-129 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Sample ID: | | MW-1-129 | MW-10-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 |
| Lab Sample ID: | | FA59885-4 | FA62319-3 | FA64647-3 | FA67552-4 | FA62319-4 | FA69910-4 | FA72991-5 | FA75552-3 | FA78697-3 | FA81666-7 | FA84062-3 |
| Sample Date: | | 12/4/2018 | 3/13/2019 | 5/30/2019 | 8/26/2019 | 3/13/2019 | 11/12/2019 | 2/28/2020 | 6/2/2020 | 9/9/2020 | 12/10/2020 | 3/18/2021 |
| Sample Type: | | N | N | N | N | N | N | N | N | N | N | N |
| Sample Depth Interval (feet): | | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 4.50 - 14.50 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 |
| **VOCs by Method 8260D (µg/L)** | **MCL** | | | | | | | | | | | |
| Benzene | 5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | 700 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| m,p-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methyl tert-butyl ether (MTBE) | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 25* | **71.7** | 2 U | **64.1** | **35** | **95.2** | **9** | **31.6** | **73** | **13.5** | **24.4** | **11.5** |
| o-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes, Total | 10,000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **PAHs by Method 8270E SIM (µg/L)** | **MCL** | | | | | | | | | | | |
| 1-Methylnaphthalene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 0.2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-c,d)pyrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 25* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Units**
µg/L = micrograms/Liter

**Notes**
FD = Field Duplicate
ID = Identification
MCL = Maximum Contaminant Level
N = Normal Environmental Sample
NA = Not Analyzed
NV = No Value
PAH = Polycyclic Aromatic Hydrocarbon
*RBSL = Risk Based Screening Level

**Detected analytes are indicated in bold.**
Results highlighted in grey exceed the MCL
Results highlighted in blue exceed the RBSL

**Qualifier**
U = Undetected: The analyte was analyzed for but not detected.

**Table 3**
**Historical Groundwater Monitoring Data**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston Air, South Carolina**

| Location ID: | | MW-1-129 | | | | | | | MW-2R-129 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Sample ID: | | MW-1-129 | MW-1-129_Q321 | MW-1-129_Q421 | MW-1-129 | MW-1-129 | MW-1-129 | MW-1-129 | MW-2R-129 | MW-2R-129Dup | MW-2R-129 | MW-2R-129(2) |
| Lab Sample ID: | | FA86722-3 | FA89303-8 | FA91593-6 | FA93635-1 | FA98065-2 | FC720-1 | FC2733-6 | NF12005-001 | NF12005-002 | FA14443-4 | FA14443-9 |
| Sample Date: | | 6/23/2021 | 9/24/2021 | 12/10/2021 | 2/28/2022 | 8/9/2022 | 11/15/2022 | 2/14/2023 | 6/11/2012 | 6/11/2012 | 4/23/2014 | 4/24/2014 |
| Sample Type: | | N | N | N | N | N | N | N | N | FD | N | N |
| Sample Depth Interval (feet): | | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 4.30 - 14.30 | 4.30 - 14.30 | 4.30 - 14.30 | 4.30 - 14.30 |
| **VOCs by Method 8260D (µg/L)** | **MCL** | | | | | | | | | | | |
| Benzene | 5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | 700 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| m,p-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methyl tert-butyl ether (MTBE) | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 25* | **46.7** | **20.7** | **27.2** | **18.3** | **31.4** | **42** | **47.4** | NA | NA | NA | NA |
| o-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes, Total | 10,000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **PAHs by Method 8270E SIM (µg/L)** | **MCL** | | | | | | | | | | | |
| 1-Methylnaphthalene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 0.2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-c,d)pyrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 25* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Units**
µg/L = micrograms/Liter

**Notes**
FD = Field Duplicate
ID = Identification
MCL = Maximum Contaminant Level
N = Normal Environmental Sample
NA = Not Analyzed
NV = No Value
PAH = Polycyclic Aromatic Hydrocarbon
*RBSL = Risk Based Screening Level

**Detected analytes are indicated in bold.**
Results highlighted in grey exceed the MCL
Results highlighted in blue exceed the RBSL

**Qualifier**
U = Undetected: The analyte was analyzed for but not detected.

**Table 3**
**Historical Groundwater Monitoring Data**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston Air, South Carolina**

| Location ID: | | MW-2R-129 | | | | MW-4-129 | | | | | MW-5-129 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Sample ID: | | MW-2R-129 | MW-2R-129 | MW-2R-129 | MW-2R-129 | MW-4-129 | MW-4-129 | MW-4-129 | MW-4-129 | MW-4-129 | Bldg-129 Dup | MW-5-129 |
| Lab Sample ID: | | FA21793-2 | FA86722-5 | FA91593-8 | FA98065-4 | J1100754-006 | 21205031301 | 21304123311 | FA14443-3 | FA21793-1 | J1100754-004 | J1100754-003 |
| Sample Date: | | 1/29/2015 | 6/23/2021 | 12/10/2021 | 8/9/2022 | 2/17/2011 | 5/2/2012 | 4/11/2013 | 4/23/2014 | 1/28/2015 | 2/17/2011 | 2/17/2011 |
| Sample Type: | | N | N | N | N | N | N | N | N | N | FD | N |
| Sample Depth Interval (feet): | | 4.30 - 14.30 | 4.30 - 14.30 | 4.30 - 14.30 | 4.30 - 14.30 | 6.04 - 16.04 | 6.04 - 16.04 | 6.04 - 16.04 | 6.04 - 16.04 | 6.04 - 16.04 | 6.00 - 16.00 | 6.00 - 16.00 |
| **VOCs by Method 8260D (µg/L)** | **MCL** | | | | | | | | | | | |
| Benzene | 5 | NA | NA | NA | NA | 0.21 U | 0.099 U | 0.111 U | 0.5 U | 0.5 U | 0.21 U | 0.21 U |
| Ethylbenzene | 700 | NA | NA | NA | NA | 0.21 U | 0.119 U | 0.109 U | 0.5 U | 0.5 U | **2.1** | **1.9** |
| m,p-Xylene | NV | NA | NA | NA | NA | 0.41 U | NA | NA | NA | NA | **3.1** | **3.1** |
| Methyl tert-butyl ether (MTBE) | NV | NA | NA | NA | NA | 0.14 U | 0.06 U | 0.078 U | 0.5 U | 0.5 U | 0.14 U | 0.14 U |
| Naphthalene | 25* | NA | 2 U | 2 U | 2 U | **0.5** | **5.75** | 0.176 U | 2 U | 2 U | **160** | **150** |
| o-Xylene | NV | NA | NA | NA | NA | 0.14 U | NA | NA | NA | NA | **1.4** | **1.4** |
| Toluene | 1,000 | NA | NA | NA | NA | 0.19 U | 0.127 U | 0.122 U | 0.5 U | 0.5 U | **0.59** | **0.53** |
| Xylenes, Total | 10,000 | NA | NA | NA | NA | NA | 0.384 U | 0.179 U | 1 U | 1 U | NA | NA |
| **PAHs by Method 8270E SIM (µg/L)** | **MCL** | | | | | | | | | | | |
| 1-Methylnaphthalene | NV | NA | NA | NA | NA | 0.074 U | 0.07 U | 0.015 U | 0.48 U | 0.42 U | **3.7** | **5.3** |
| 2-Methylnaphthalene | NV | NA | NA | NA | NA | 0.073 U | 0.065 U | 0.014 U | 0.48 U | 0.42 U | **1.9** | **3.1** |
| Acenaphthene | NV | NA | NA | NA | NA | 0.079 U | 0.038 U | 0.004 U | 0.48 U | 0.42 U | **8** | **11** |
| Acenaphthylene | NV | NA | NA | NA | NA | 0.076 U | 0.071 U | 0.012 U | 0.48 U | 0.42 U | **0.41** | **0.52** |
| Anthracene | NV | NA | NA | NA | NA | 0.076 U | 0.025 U | 0.02 U | 0.48 U | 0.42 U | **0.47** | **0.57** |
| Benzo(a)anthracene | NV | NA | NA | NA | NA | 0.068 U | 0.06 U | 0.0092 U | 0.048 U | 0.042 U | **0.37** | **0.48** |
| Benzo(a)pyrene | 0.2 | NA | NA | NA | NA | 0.054 U | 0.023 U | 0.0056 U | 0.048 U | 0.042 U | **0.23** | **0.3** |
| Benzo(b)fluoranthene | NV | NA | NA | NA | NA | 0.069 U | 0.019 U | 0.0042 U | 0.048 U | 0.042 U | **0.26** | **0.32** |
| Benzo(g,h,i)perylene | NV | NA | NA | NA | NA | 0.063 U | 0.037 U | 0.0053 U | 0.048 U | 0.042 U | **0.084** | **0.11** |
| Benzo(k)fluoranthene | NV | NA | NA | NA | NA | 0.076 U | 0.04 U | 0.008 U | 0.048 U | 0.042 U | **0.19** | **0.24** |
| Chrysene | NV | NA | NA | NA | NA | 0.073 U | 0.019 U | 0.0086 U | 0.095 U | 0.083 U | **0.43** | **0.49** |
| Dibenz(a,h)anthracene | NV | NA | NA | NA | NA | 0.057 U | 0.035 U | 0.0078 U | 0.048 U | 0.042 U | **0.6** | **0.61** |
| Fluoranthene | NV | NA | NA | NA | NA | 0.087 U | 0.04 U | 0.0034 U | 0.48 U | 0.42 U | **2** | **2.5** |
| Fluorene | NV | NA | NA | NA | NA | 0.077 U | 0.099 U | 0.019 U | 0.48 U | 0.42 U | **3.8** | **5.1** |
| Indeno(1,2,3-c,d)pyrene | NV | NA | NA | NA | NA | 0.062 U | 0.041 U | 0.0025 U | 0.048 U | 0.042 U | **0.54** | **0.56** |
| Naphthalene | 25* | NA | NA | NA | NA | **0.1** | 0.038 U | 0.0046 U | 0.48 U | 0.42 U | **13** | **17** |
| Phenanthrene | NV | NA | NA | NA | NA | **0.094** | 0.029 U | 0.0034 U | 0.48 U | 0.42 U | **1.5** | **1.6** |
| Pyrene | NV | NA | NA | NA | NA | 0.07 U | 0.036 U | 0.0072 U | 0.48 U | 0.42 U | **1.2** | **1.5** |

**Units**
µg/L = micrograms/Liter

**Notes**
FD = Field Duplicate
ID = Identification
MCL = Maximum Contaminant Level
N = Normal Environmental Sample
NA = Not Analyzed
NV = No Value
PAH = Polycyclic Aromatic Hydrocarbon
*RBSL = Risk Based Screening Level

**Detected analytes are indicated in bold.**
Results highlighted in grey exceed the MCL
Results highlighted in blue exceed the RBSL

**Qualifier**
U = Undetected: The analyte was analyzed for but not detected.

**Table 3**
**Historical Groundwater Monitoring Data**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston Air, South Carolina**

| Location ID: | | MW-5-129 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Sample ID: | | MW-5-129 | MW-5-129-B | MW-5-129 | MW-5-129-b | MW-205-129 | MW-5-129 | MW-205-129 | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 |
| Lab Sample ID: | | 21205031305 | 21205031308 | 21304161605 | 21304161608 | FA14443-1 | FA14443-7 | FA21793-7 | FA21793-6 | FA36254-5 | FA42001-9 | FA44581-5 |
| Sample Date: | | 5/2/2012 | 5/2/2012 | 4/15/2013 | 4/15/2013 | 4/23/2014 | 4/23/2014 | 1/29/2015 | 1/29/2015 | 8/16/2016 | 3/10/2017 | 6/2/2017 |
| Sample Type: | | N | FD | N | FD | FD | N | FD | N | N | N | N |
| Sample Depth Interval (feet): | | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 |
| **VOCs by Method 8260D (µg/L)** | **MCL** | | | | | | | | | | | |
| Benzene | 5 | 0.099 U | 0.099 U | 0.111 U | 0.111 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | NA |
| Ethylbenzene | 700 | **1.65** | 0.119 U | 0.109 U | 0.109 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | NA |
| m,p-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methyl tert-butyl ether (MTBE) | NV | 0.06 U | 0.06 U | 0.078 U | 0.078 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | NA |
| Naphthalene | 25* | **160** | **31** | 0.176 U | 0.176 U | **9.8** | **10.1** | **17.6** | **14.7** | **12.1** | **24** | **15.4** |
| o-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | 1,000 | 0.127 U | 0.127 U | 0.122 U | 0.122 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | NA |
| Xylenes, Total | 10,000 | **4.98** | 0.384 U | 0.179 U | 0.179 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | NA |
| **PAHs by Method 8270E SIM (µg/L)** | **MCL** | | | | | | | | | | | |
| 1-Methylnaphthalene | NV | **0.37** | **0.215** | 0.016 U | 0.015 U | **3.1** | **3.5** | **2.7** | **2.8** | NA | NA | NA |
| 2-Methylnaphthalene | NV | **0.44** | **0.464** | 0.015 U | 0.015 U | **5.8** | **6.5** | **5.2** | **5.4** | NA | NA | NA |
| Acenaphthene | NV | **8.99** | **12.8** | **0.147** | **0.417** | **6.7** | **7.6** | **5.6** | **5.5** | NA | NA | NA |
| Acenaphthylene | NV | **4.33** | **3.11** | **0.507** | **0.264** | 0.47 U | 0.48 U | 0.43 U | 0.42 U | NA | NA | NA |
| Anthracene | NV | **10.1** | **2.49** | **0.663** | **0.41** | **1.1** | **1.6** | **0.71** | **0.63** | NA | NA | NA |
| Benzo(a)anthracene | NV | **11.3** | **4.32** | **1.53** | **0.646** | **0.83** | **0.66** | **0.42** | **0.34** | NA | NA | NA |
| Benzo(a)pyrene | 0.2 | **14** | **4.19** | **1.65** | **0.642** | **0.39** | **0.24** | **0.19** | **0.18** | NA | NA | NA |
| Benzo(b)fluoranthene | NV | **18.2** | **5.78** | **1.73** | **0.422** | **0.52** | **0.3** | **0.22** | **0.23** | NA | NA | NA |
| Benzo(g,h,i)perylene | NV | **11.5** | **3.45** | **0.585** | **0.297** | **0.14** | **0.081** | **0.083** | **0.077** | NA | NA | NA |
| Benzo(k)fluoranthene | NV | **6.79** | **1.84** | **1.07** | **0.476** | **0.44** | **0.27** | **0.19** | **0.16** | NA | NA | NA |
| Chrysene | NV | **19.1** | **4.46** | **2.69** | **1.37** | **0.97** | **0.69** | **0.42** | **0.33** | NA | NA | NA |
| Dibenz(a,h)anthracene | NV | **1.7** | **0.619** | **0.087** | **0.048** | 0.047 U | 0.048 U | 0.043 U | 0.042 U | NA | NA | NA |
| Fluoranthene | NV | **8.81** | **4.01** | **1.95** | **1.08** | **5** | **5** | **2.7** | **2.4** | NA | NA | NA |
| Fluorene | NV | **1.26** | **0.735** | **0.148** | **0.345** | **6.1** | **6.8** | **4.3** | **4.1** | NA | NA | NA |
| Indeno(1,2,3-c,d)pyrene | NV | **12.2** | **4.17** | **0.596** | **0.294** | **0.17** | **0.13** | **0.11** | **0.11** | NA | NA | NA |
| Naphthalene | 25* | **1.18** | **0.631** | 0.0049 U | 0.0047 U | **8.7** | **9.3** | **9.5** | **10.3** | NA | NA | NA |
| Phenanthrene | NV | **3.2** | **0.973** | **0.413** | **0.463** | **11.1** | **12.1** | **7.2** | **6.4** | NA | NA | NA |
| Pyrene | NV | **10.3** | **3.61** | **1.78** | **0.839** | **3.2** | **2.8** | **1.6** | **1.3** | NA | NA | NA |

**Units**
µg/L = micrograms/Liter

**Notes**
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ID = Identification
MCL = Maximum Contaminant Level
N = Normal Environmental Sample
NA = Not Analyzed
NV = No Value
PAH = Polycyclic Aromatic Hydrocarbon
*RBSL = Risk Based Screening Level

**Detected analytes are indicated in bold.**
Results highlighted in grey exceed the MCL
Results highlighted in blue exceed the RBSL

**Qualifier**
U = Undetected: The analyte was analyzed for but not detected.

**Table 3**
**Historical Groundwater Monitoring Data**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston Air, South Carolina**

| Location ID: | | MW-5-129 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Sample ID: | | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 |
| Lab Sample ID: | | FA48060-8 | FA49907-9 | FA52436-5 | FA55076-4 | FA57983-5 | FA59885-5 | FA62319-5 | FA64647-4 | FA67552-5 | FA69910-5 | FA72991-6 |
| Sample Date: | | 9/25/2017 | 12/5/2017 | 3/13/2018 | 6/14/2018 | 9/25/2018 | 12/4/2018 | 3/13/2019 | 5/30/2019 | 8/26/2019 | 11/12/2019 | 2/28/2020 |
| Sample Type: | | N | N | N | N | N | N | N | N | N | N | N |
| Sample Depth Interval (feet): | | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 |
| **VOCs by Method 8260D (µg/L)** | **MCL** | | | | | | | | | | | |
| Benzene | 5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | 700 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| m,p-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methyl tert-butyl ether (MTBE) | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 25* | **27.1** | **50.5** | **18.7** | **22.9** | **11.7** | 2 U | **28.3** | 2 U | **5.7** | **6.5** | **95.3** |
| o-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes, Total | 10,000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **PAHs by Method 8270E SIM (µg/L)** | **MCL** | | | | | | | | | | | |
| 1-Methylnaphthalene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 0.2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-c,d)pyrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 25* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Units**
µg/L = micrograms/Liter

**Notes**
FD = Field Duplicate
ID = Identification
MCL = Maximum Contaminant Level
N = Normal Environmental Sample
NA = Not Analyzed
NV = No Value
PAH = Polycyclic Aromatic Hydrocarbon
*RBSL = Risk Based Screening Level

**Detected analytes are indicated in bold.**
Results highlighted in grey exceed the MCL
Results highlighted in blue exceed the RBSL

**Qualifier**
U = Undetected: The analyte was analyzed for but not detected.

**Table 3**
**Historical Groundwater Monitoring Data**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston Air, South Carolina**

| Location ID: | | MW-5-129 | | | | | | | | MW-7-129 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Sample ID: | | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129 | MW-5-129_Q321 | MW-5-129_Q421 | MW-5-129 | MW-7-129 | MW-7-129 | MW-7-129 |
| Lab Sample ID: | | FA75552-2 | FA78697-2 | FA81666-6 | FA84062-2 | FA86722-2 | FA89303-7 | FA91593-5 | FA98065-3 | J1100754-001 | 21205031303 | 21304123310 |
| Sample Date: | | 6/2/2020 | 9/9/2020 | 12/10/2020 | 3/18/2021 | 6/23/2021 | 9/24/2021 | 12/10/2021 | 8/9/2022 | 2/17/2011 | 5/2/2012 | 4/11/2013 |
| Sample Type: | | N | N | N | N | N | N | N | N | N | N | N |
| Sample Depth Interval (feet): | | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 6.00 - 16.00 | 4.94 - 14.94 | 4.94 - 14.94 | 4.94 - 14.94 |
| **VOCs by Method 8260D (µg/L)** | **MCL** | | | | | | | | | | | |
| Benzene | 5 | NA | NA | NA | NA | NA | NA | NA | NA | 0.21 U | 0.099 U | 0.111 U |
| Ethylbenzene | 700 | NA | NA | NA | NA | NA | NA | NA | NA | 0.21 U | 0.119 U | 0.109 U |
| m,p-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.41 U | NA | NA |
| Methyl tert-butyl ether (MTBE) | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.14 U | 0.06 U | 0.078 U |
| Naphthalene | 25* | **37.2** | **25.8** | **16.3** | **2** | **1.5** | **16.9** | **4.6** | **7** | 0.24 U | 0.065 U | 0.176 U |
| o-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.14 U | NA | NA |
| Toluene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA | **0.19** | 0.127 U | 0.122 U |
| Xylenes, Total | 10,000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.384 U | 0.179 U |
| **PAHs by Method 8270E SIM (µg/L)** | **MCL** | | | | | | | | | | | |
| 1-Methylnaphthalene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.074 U | 0.069 U | 0.015 U |
| 2-Methylnaphthalene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.073 U | 0.064 U | 0.014 U |
| Acenaphthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.079 U | 0.037 U | 0.004 U |
| Acenaphthylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.076 U | 0.07 U | 0.012 U |
| Anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.076 U | 0.024 U | 0.02 U |
| Benzo(a)anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.068 U | 0.059 U | 0.0092 U |
| Benzo(a)pyrene | 0.2 | NA | NA | NA | NA | NA | NA | NA | NA | 0.054 U | 0.023 U | 0.0056 U |
| Benzo(b)fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.069 U | 0.018 U | 0.0042 U |
| Benzo(g,h,i)perylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.063 U | **0.311** | 0.0053 U |
| Benzo(k)fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.076 U | 0.039 U | 0.008 U |
| Chrysene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.073 U | 0.018 U | 0.0086 U |
| Dibenz(a,h)anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | **0.59** | **0.203** | 0.0078 U |
| Fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.088 U | 0.04 U | 0.0034 U |
| Fluorene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.077 U | 0.098 U | 0.019 U |
| Indeno(1,2,3-c,d)pyrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | **0.47** | **0.204** | 0.0025 U |
| Naphthalene | 25* | NA | NA | NA | NA | NA | NA | NA | NA | **0.073** | 0.038 U | 0.0046 U |
| Phenanthrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.087 U | 0.028 U | 0.0034 U |
| Pyrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | 0.07 U | 0.036 U | 0.0072 U |

**Units**
µg/L = micrograms/Liter

**Notes**
FD = Field Duplicate
ID = Identification
MCL = Maximum Contaminant Level
N = Normal Environmental Sample
NA = Not Analyzed
NV = No Value
PAH = Polycyclic Aromatic Hydrocarbon
*RBSL = Risk Based Screening Level

**Detected analytes are indicated in bold.**
Results highlighted in grey exceed the MCL
Results highlighted in blue exceed the RBSL

**Qualifier**
U = Undetected: The analyte was analyzed for but not detected.

**Table 3**
**Historical Groundwater Monitoring Data**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston Air, South Carolina**

| Location ID: | | MW-7-129 | | MW-10-129 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Sample ID: | | MW-7-129 | MW-7-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 |
| Lab Sample ID: | | FA14443-8 | FA21793-3 | J1100754-002 | 21205031304 | 21304161603 | FA14443-2 | FA21793-5 | FA36254-4 | FA42001-8 | FA44581-6 | FA48060-7 |
| Sample Date: | | 4/24/2014 | 1/29/2015 | 2/17/2011 | 5/2/2012 | 4/15/2013 | 4/23/2014 | 1/29/2015 | 8/16/2016 | 3/10/2017 | 6/2/2017 | 9/25/2017 |
| Sample Type: | | N | N | N | N | N | N | N | N | N | N | N |
| Sample Depth Interval (feet): | | 4.94 - 14.94 | 4.94 - 14.94 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 |
| **VOCs by Method 8260D (µg/L)** | **MCL** | | | | | | | | | | | |
| Benzene | 5 | 0.5 U | 0.5 U | 0.21 U | 0.099 U | 0.111 U | 0.5 U | 0.5 U | 0.5 U | NA | NA | NA |
| Ethylbenzene | 700 | 0.5 U | 0.5 U | 0.21 U | 0.119 U | 0.109 U | 0.5 U | 0.5 U | 0.5 U | NA | NA | NA |
| m,p-Xylene | NV | NA | NA | 0.41 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Methyl tert-butyl ether (MTBE) | NV | 0.5 U | 0.5 U | 0.14 U | 0.06 U | 0.078 U | 0.5 U | 0.5 U | 0.5 U | NA | NA | NA |
| Naphthalene | 25* | 2 U | 2 U | 0.24 U | 0.065 U | 0.176 U | 2 U | **1.3** | 2 U | 2 U | 2 U | 2 U |
| o-Xylene | NV | NA | NA | 0.14 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | 1,000 | 0.5 U | 0.5 U | 0.19 U | 0.127 U | 0.122 U | 0.5 U | 0.5 U | 0.5 U | NA | NA | NA |
| Xylenes, Total | 10,000 | 1 U | 1 U | NA | 0.384 U | 0.179 U | 1 U | 1 U | 1 U | NA | NA | NA |
| **PAHs by Method 8270E SIM (µg/L)** | **MCL** | | | | | | | | | | | |
| 1-Methylnaphthalene | NV | 0.48 U | 0.43 U | 0.074 U | 0.07 U | **0.108** | 0.47 U | 0.43 U | NA | NA | NA | NA |
| 2-Methylnaphthalene | NV | 0.48 U | 0.43 U | 0.073 U | 0.065 U | 0.015 U | 0.47 U | 0.43 U | NA | NA | NA | NA |
| Acenaphthene | NV | 0.48 U | 0.43 U | **0.094** | 0.038 U | 0.0042 U | 0.47 U | 0.43 U | NA | NA | NA | NA |
| Acenaphthylene | NV | 0.48 U | 0.43 U | 0.076 U | 0.071 U | 0.013 U | 0.47 U | 0.43 U | NA | NA | NA | NA |
| Anthracene | NV | 0.48 U | 0.43 U | 0.076 U | 0.025 U | 0.021 U | 0.47 U | 0.43 U | NA | NA | NA | NA |
| Benzo(a)anthracene | NV | 0.048 U | 0.043 U | 0.067 U | 0.06 U | 0.0097 U | 0.047 U | 0.043 U | NA | NA | NA | NA |
| Benzo(a)pyrene | 0.2 | 0.048 U | 0.043 U | 0.054 U | 0.023 U | 0.0058 U | 0.047 U | 0.043 U | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NV | 0.048 U | 0.043 U | 0.069 U | 0.019 U | 0.0045 U | 0.047 U | 0.043 U | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | NV | 0.048 U | 0.043 U | 0.063 U | 0.037 U | 0.0056 U | 0.047 U | 0.043 U | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NV | 0.048 U | 0.043 U | 0.076 U | 0.04 U | 0.0084 U | 0.047 U | 0.043 U | NA | NA | NA | NA |
| Chrysene | NV | 0.096 U | 0.087 U | 0.073 U | 0.019 U | 0.009 U | 0.094 U | 0.087 U | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | NV | 0.048 U | 0.043 U | 0.057 U | 0.035 U | 0.0082 U | 0.047 U | 0.043 U | NA | NA | NA | NA |
| Fluoranthene | NV | 0.48 U | 0.43 U | 0.087 U | 0.04 U | 0.0036 U | 0.47 U | 0.43 U | NA | NA | NA | NA |
| Fluorene | NV | 0.48 U | 0.43 U | **0.18** | **0.164** | 0.02 U | **0.39** | 0.43 U | NA | NA | NA | NA |
| Indeno(1,2,3-c,d)pyrene | NV | 0.048 U | 0.043 U | 0.062 U | 0.041 U | 0.0026 U | 0.047 U | 0.043 U | NA | NA | NA | NA |
| Naphthalene | 25* | 0.48 U | 0.43 U | **0.084** | 0.038 U | **0.149** | 0.47 U | **0.54** | NA | NA | NA | NA |
| Phenanthrene | NV | 0.48 U | 0.43 U | 0.086 U | 0.029 U | 0.0036 U | **0.36** | 0.43 U | NA | NA | NA | NA |
| Pyrene | NV | 0.48 U | 0.43 U | 0.07 U | 0.036 U | 0.0075 U | 0.47 U | 0.43 U | NA | NA | NA | NA |

**Units**
µg/L = micrograms/Liter
**Notes**
FD = Field Duplicate
ID = Identification
MCL = Maximum Contaminant Level
N = Normal Environmental Sample
NA = Not Analyzed
NV = No Value
PAH = Polycyclic Aromatic Hydrocarbon
*RBSL = Risk Based Screening Level

**Detected analytes are indicated in bold.**
Results highlighted in grey exceed the MCL
Results highlighted in blue exceed the RBSL

**Qualifier**
U = Undetected: The analyte was analyzed for but not detected.

**Table 3**
**Historical Groundwater Monitoring Data**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston Air, South Carolina**

| Location ID: | | MW-10-129 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Sample ID: | | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 | MW-10-129 |
| Lab Sample ID: | | FA49907-7 | FA52436-4 | FA55076-3 | FA57983-3 | FA59885-3 | FA64647-2 | FA67552-3 | FA69910-3 | FA86722-4 | FA91593-7 | FA98065-1 |
| Sample Date: | | 12/5/2017 | 3/13/2018 | 6/14/2018 | 9/25/2018 | 12/4/2018 | 5/30/2019 | 8/26/2019 | 11/12/2019 | 6/23/2021 | 12/10/2021 | 8/9/2022 |
| Sample Type: | | N | N | N | N | N | N | N | N | N | N | N |
| Sample Depth Interval (feet): | | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 | 4.50 - 14.50 |
| **VOCs by Method 8260D (µg/L)** | **MCL** | | | | | | | | | | | |
| Benzene | 5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | 700 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| m,p-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methyl tert-butyl ether (MTBE) | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 25* | 2 U | **1.9** | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U |
| o-Xylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes, Total | 10,000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **PAHs by Method 8270E SIM (µg/L)** | **MCL** | | | | | | | | | | | |
| 1-Methylnaphthalene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 0.2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-c,d)pyrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 25* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | NV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Units**
µg/L = micrograms/Liter

**Notes**
FD = Field Duplicate
ID = Identification
MCL = Maximum Contaminant Level
N = Normal Environmental Sample
NA = Not Analyzed
NV = No Value
PAH = Polycyclic Aromatic Hydrocarbon
*RBSL = Risk Based Screening Level

**Detected analytes are indicated in bold.**
Results highlighted in grey exceed the MCL
Results highlighted in blue exceed the RBSL

**Qualifier**
U = Undetected: The analyte was analyzed for but not detected.

**Table 4**
**AOC T (TU544) Biosparge System - Air Sparge Pressure Design**
**Groundwater Monitoring Report and Site-Specific Work Plan for AOC T (TU544)**
**Joint Base Charleston - Air, South Carolina**

| Longest Pipe Run (feet) | Air Flow Rate (cfm) | Conveyance Pipe Diameter (inches) | Friction Piping Loss (psi/100 ft) | Maximum Friction Piping Loss (*de minimus* ) (psi) | Depth to Top of Screen Below Water Table (feet) | Hydrostatic Loss (psi/ft) | Total Hydrostatic Loss (psi) | Breakout Pressure* (psi) | Total Pressure Loss (psi) |
|---|---|---|---|---|---|---|---|---|---|
| 50 | 2 | 0.5 | 0.0036 | 0.0018 | 15 | 0.433 | 6.50 | 1.30 | 7.80 |

| **Oxygen Delivery** | | | | | |
|---|---|---|---|---|---|
| Air flow rate (System) (cfm) | Air Flow Rate (System) (cfd) | Density of Air (pounds/cf) | Pounds of air per day (pounds) | Concentration of Oxygen in Air (%) | Pounds of Oxygen per day (pounds) |
| 6 | 8,640 | 0.0748 | 646.27 | 20.90 | 135.07 |

**Notes:**
cf - cubic feet
cfm - cubic feet per minute
cfd - cubic feet per day
psi - pounds per square inch
ft - foot
% - percent
* - Estimated at 20% of Hydrostatic Head

# Attachment 3

## Well Development and Sampling Forms

# MW-1-129

## 1-Well Integrity

| | | | |
|---|---|---|---|
| Date | 09/29/2023 | Time | 15:13 |
| Well Integrity | | Well needs repair | No |
| Needs well tag | Yes | Locking cap | Yes |
| Remarks | Needs new lock | | |

## 2-Purging Data

| | | | |
|---|---|---|---|
| Date | 09/29/2023 | Time | 15:13 |
| Well diameter (inches) | 4 | Tubing diameter (inches) | 0.25 |
| Well screen interval depth (feet to feet) | 6 to 16 | Static depth to water (feet) | 3.31 |
| Free product? | NO | Depth to product (ft btoc) | |
| Purge pump type or bailer | PP-Peristaltic Pump | Total well depth (feet) | 15.91 |
| Well capacity (gallons/ foot) | 0.65 | Well volume purge: 1 Well volume (gallons) | 10.34 |
| Pump volume (gallons) | | Tubing capacity (gallons/ foot) | |
| Tubing length (feet) | 19 | Flow cell volume (gallons) | |
| Equipment volume purge: 1 Equipment vol. (gallons) | | Initial pump or tubing depth in well (feet) | 13.5 |
| Final pump or tubing depth in well (feet) | | Purging Initiated At | |
| Purging Ended At | | Total volume purged (gallons) | |

## 3-Stabilization Parameters

| Date | Time | Volume Purged (gallons) | Cuml Volume Purged (gallons) | Purge Rate (gpm) | Depth To Water (feet) | pH (SU) | Tempera (C) | Spec Cond (uS/cm) | Dissolve Oxygen (mg/L) | Turbidity (NTU) | ORP (mV) | Color/ odor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/29/23 | 15:25 | 0.1 | | 0.05 | 3.63 | 5.87 | 22.1 | 111.1 | 0.43 | 1.75 | -33 | Clear |
| 09/29/23 | 15:30 | 0.25 | | 0.05 | 3.74 | 5.87 | 22.1 | 106.5 | 0.31 | 2.49 | -37.7 | Clear |
| 09/29/23 | 15:35 | 0.25 | | 0.05 | 3.91 | 5.87 | 22.3 | 106.4 | 0.31 | 2.52 | -39.9 | Clear |
| 09/29/23 | 15:40 | 0.25 | | 0.05 | 3.99 | 5.87 | 22.3 | 108 | 0.26 | 3.22 | -44.1 | Clear |
| 09/29/23 | 15:45 | 0.25 | | 0.05 | 4.17 | 5.87 | 22.3 | 103.3 | 0.26 | 2.78 | -45.0 | Clear |
| 09/29/23 | 15:50 | 0.25 | | 0.05 | 2.66 | 5.87 | 22.3 | 107.3 | 0.25 | 1.69 | -46.3 | Clear |

## 4-Sample

| | | | |
|---|---|---|---|
| Date | 09/29/2023 | Date | 11/06/2023 |
| Time | 15:55 | Time | 14:34 |

| | | | |
|---|---|---|---|
| Sample ID | MW-1-129_0923 | Sample Date | 09/29/2023 |
| Sample Time | 15:55 | Pump or tubing depth in well (feet) | 13.5 |
| Tubing material code | Teflon | Field-Filtered | N |
| Filtration equipment type | | Filter size (um) | |
| Field decontamination-Pump | NA | Field decontamination-Tubing | N |
| Duplicate | Y | Sampled by | CR |
| Affiliation | Bhate | Sampler(s) signature(s) |  |
| Remarks | 8260 and 8270 DUPs | | |

## 5-Sampling Container

| Date | Time | # of Containers | Material Code | Volume | Preservative Used | Intended Analysis/ Method | Sampling Equipment Code | Sample Pump Flow Rate (mL/ minute) |
|---|---|---|---|---|---|---|---|---|
| 09/29/23 | 16:14 | 4 | AG-Amber Glass | 250 mL | None | 8270E Naphthalene SVOCs + DUP | | 200 |
| 09/29/23 | 16:42 | 6 | CG-Clear Glass | 40 mL | HCL | 8260D Naphthalene VOCs | | 200 |

## Photos

# MW-1R-129

## 1-Well Integrity

| | | | |
|---|---|---|---|
| Date | 04/18/2024 | Time | 17:03 |
| Well Integrity | | Well needs repair | No |
| Needs well tag | No | Locking cap | No |
| Remarks | New well. Developed last week. Lock keyed to 1600. | | |

## 2-Purging Data

| | | | |
|---|---|---|---|
| Date | 04/18/2024 | Time | 17:07 |
| Well diameter (inches) | 2.00 | Tubing diameter (inches) | 0.25 |
| Well screen interval depth (feet to feet) | 6 to 16 | Static depth to water (feet) | 3.10 |
| Free product? | NO | Depth to product (ft btoc) | |
| Purge pump type or bailer | PP-Peristaltic Pump | Total well depth (feet) | 13.91 |
| Well capacity (gallons/ foot) | 0.16 | Well volume purge: 1 Well volume (gallons) | 1.73 |
| Pump volume (gallons) | | Tubing capacity (gallons/ foot) | |
| Tubing length (feet) | 16 | Flow cell volume (gallons) | |
| Equipment volume purge: 1 Equipment vol. (gallons) | | Initial pump or tubing depth in well (feet) | 13 |
| Final pump or tubing depth in well (feet) | 13 | Purging Initiated At | 17:15 |
| Purging Ended At | 19:35 | Total volume purged (gallons) | 6.75 |

## 3-Stabilization Parameters

| Date | Time | Volume Purged (gallons) | Cuml Volume Purged (gallons) | Purge Rate (gpm) | Depth To Water (feet) | pH (SU) | Temperat (C) | Spec Cond (uS/cm) | Dissolvec Oxygen (mg/L) | Turbidity (NTU) | ORP (mV) | Color/ odor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/18/24 | 17:20 | 0.25 | 0.25 | 0.05 | 3.42 | 11.84 | 20.5 | 1.900 | 0.69 | 9.81 | 59.0 | Clear, no odor |
| 04/18/24 | 17:25 | 0.25 | 0.50 | 0.05 | 3.42 | 11.69 | 20.5 | 1.260 | 0.44 | 9.69 | 45.4 | Clear, no odor |
| 04/18/24 | 17:30 | 0.25 | 0.75 | 0.05 | 3.42 | 11.58 | 20.5 | 1.040 | 0.34 | 12.63 | 33.5 | Clear, no odor |
| 04/18/24 | 17:35 | 0.25 | 1.00 | 0.05 | 3.42 | 11.36 | 20.5 | 0.8 | 0.25 | 12.98 | 15 | Clear with some sediment no odor |

| Date | Time | Volume Purged (gallons) | Cuml Volume Purged (gallons) | Purge Rate (gpm) | Depth To Water (feet) | pH (SU) | Temperat (C) | Spec Cond (uS/cm) | Dissolvec Oxygen (mg/L) | Turbidity (NTU) | ORP (mV) | Color/ odor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/18/24 | 17:40 | 0.25 | 1.25 | 0.05 | 3.47 | 11.29 | 20.5 | 0.578 | 0.23 | 8.10 | -16.6 | Clear no odor |
| 04/18/24 | 17:45 | 0.25 | 1.50 | 0.05 | 3.48 | 11.27 | 20.2 | 0.549 | 0.23 | 7.61 | -23.1 | Clear no odor |
| 04/18/24 | 17:50 | 0.25 | 1.75 | 0.05 | 3.49 | 11.24 | 20. | 0.536 | 0.22 | 7.27 | -35.3 | Clear no odor |
| 04/18/24 | 17:55 | 0.25 | 2 | 0.05 | 3.5 | 11.13 | 19.8 | 0.599 | 0.21 | 7.90 | -53.1 | Clear no odor |
| 04/18/24 | 18:00 | 0.25 | 2.25 | 0.05 | 3.52 | 11.13 | 19.7 | 0.440 | 0.20 | 7.18 | -78.2 | Clear no odor |
| 04/18/24 | 18:05 | 0.25 | 2.50 | 0.05 | 3.55 | 11.08 | 19.6 | 0.441 | 0.2 | 8.46 | -85 | Clear no odor |
| 04/18/24 | 18:10 | 0.25 | 2.75 | 0.05 | 3.59 | 11.0 | 19.7 | 0.422 | 0.19 | 9.23 | -96.5 | Clear no odor |
| 04/18/24 | 18:15 | 0.25 | 3 | 0.05 | 3.59 | 10.93 | 19.8 | 0.335 | 0.19 | 9.61 | -103.8 | Clear no odor |
| 04/18/24 | 18:20 | 0.25 | 3.25 | 0.05 | 3.58 | 10.90 | 19.7 | 0.255 | 0.18 | 11.55 | -114.8 | Clear no odor |
| 04/18/24 | 18:25 | 0.25 | 3.50 | 0.05 | 3.58 | 10.76 | 19.7 | 0.270 | 0.18 | 12.42 | -124.9 | Clear no odor |
| 04/18/24 | 18:30 | 0.25 | 3.75 | 0.05 | 3.6 | 10.86 | 19.6 | 0.300 | 0.17 | 9.3 | -130.4 | Clear, no odor |
| 04/18/24 | 18:35 | 0.25 | 4.00 | 0.05 | 3.6 | 10.85 | 19.6 | 0.296 | 0.17 | 9.52 | -139.6 | Clear, no odor |
| 04/18/24 | 18:40 | 0.25 | 4.25 | 0.05 | 3.62 | 10.67 | 19.7 | 0.250 | 0.17 | 8.73 | -150.0 | Clear, no odor |
| 04/18/24 | 18:45 | 0.25 | 4.50 | 0.05 | 3.63 | 10.77 | 19.7 | 0.264 | 0.17 | 9.99 | -159.9 | Clear, no odor |
| 04/18/24 | 18:50 | 0.25 | 4.75 | 0.05 | 3.65 | 10.75 | 19.7 | 0.254 | 0.16 | 8.55 | -169 | Clear, no odor |
| 04/18/24 | 18:55 | 0.25 | 5.00 | 0.05 | 3.65 | 10.75 | 19.7 | 0.238 | 0.16 | 8.92 | -170.7 | Clear, no odor |
| 04/18/24 | 19:00 | 0.25 | 5.25 | 0.05 | 3.65 | 10.74 | 19.6 | 0.232 | 0.16 | 9.42 | -171.8 | Clear, no odor |
| 04/18/24 | 19:05 | 0.25 | 5.50 | 0.05 | 3.64 | 10.69 | 19.6 | 0.212 | 0.16 | 9.42 | -188.7 | Clear, no odor |
| 04/18/24 | 19:10 | 0.25 | 5.75 | 0.05 | 3.63 | 10.66 | 19.6 | 0.206 | 0.16 | 9.79 | -186.0 | Clear, no odor |
| 04/18/24 | 19:15 | 0.25 | 6.00 | 0.05 | 3.63 | 10.62 | 19.6 | 0.201 | 0.16 | 9.99 | -195.9 | Clear, no odor |

| Date | Time | Volume Purged (gallons) | Cuml Volume Purged (gallons) | Purge Rate (gpm) | Depth To Water (feet) | pH (SU) | Temperat (C) | Spec Cond (uS/cm) | Dissolvec Oxygen (mg/L) | Turbidity (NTU) | ORP (mV) | Color/ odor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/18/24 | 19:20 | 0.25 | 6.25 | 0.05 | 3.63 | 10.59 | 19.6 | 0.200 | 0.16 | 9.28 | -222.2 | Clear, no odor |
| 04/18/24 | 19:25 | 0.25 | 6.50 | 0.05 | 3.62 | 10.53 | 19.6 | 0.189 | 0.16 | 6.69 | -245.0 | Clear, no odor |
| 04/18/24 | 19:30 | 0.25 | 6.50 | 0.05 | 3.60 | 10.57 | 19.5 | 0.184 | 0.15 | 6.64 | -255.8 | Clear, no odor |
| 04/18/24 | 19:35 | 0.25 | 6.75 | 0.05 | 3.60 | 10.57 | 19.5 | 0.181 | 0.15 | 6.76 | -259.9 | Clear, no odor |

## 4-Sample

| | | | |
|---|---|---|---|
| Date | 04/18/2024 | Time | 19:40 |
| Sample ID | TU544-MW1R-129_0424, ""-a, ""-MS, ""-MSD | Sample Date | 04/18/2024 |
| Sample Time | 19:40 | Pump or tubing depth in well (feet) | 13 |
| Tubing material code | Teflon | Field-Filtered | N |
| Filtration equipment type | None | Filter size (um) | |
| Field decontamination-Pump | N | Field decontamination-Tubing | N |
| Duplicate | Y | Sampled by | Caitlin Ryan |
| Affiliation | Bhate | Sampler(s) signature(s) | Caitlin Ryan |
| Remarks | DUP, MS, and MSD | | |

## 5-Sampling Container

| Date | Time | # of Containers | Material Code | Volume | Preservative Used | Intended Analysis/ Method | Sampling Equipment Code | Sample Pump Flow Rate (mL/ minute) |
|---|---|---|---|---|---|---|---|---|
| 04/18/24 | 19:45 | 8 | AG-Amber Glass | 250 mL | None | 8270 -Naphthalene only | APP-After Peristaltic Pump | 200 |
| 04/18/24 | 19:46 | 12 | CG-Clear Glass | 40 mL | HCL | 8260 - Naphthalene only | APP-After Peristaltic Pump | 200 |

## Photos

# Attachment 4

## Laboratory and Data Validation Reports

# Report of Analysis

**Arcadis U.S., Inc.**
30 Patewood Drive
Suite 155
Greenville, SC 29615
Attention: Kathleen Hamrick

Project Name: JBC Air, LTM

Lot Number:**YI30001**

Date Completed:11/03/2023

11/03/2023 1:52 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.


Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

## Case Narrative
## Arcadis U.S., Inc.
### Lot Number: YI30001

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report. Where sampling is conducted by the client, results relate to the accuracy of the information provided, and as the samples are received.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Additionally, the DoD QSM version 5.4 has been followed for these samples. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs, the DoD QSM, or policies are qualified on the results page or discussed below.

Pace is a DoD/DOE accredited laboratory; however, the following analyses are currently not listed on our DoD/DOE scope of accreditation: Drinking Water: pH EPA 150.1, Turbidity EPA 180.1, Metals EPA 200.7 & 200.8, Mercury EPA 245.1, Anions EPA 300.0, Cyanide EPA 335.4, Nitrates EPA 353.2, Orthophosphate & Phosphorus EPA 365.1, EDB/DBCP EPA 504.1, HPC SIMPLATE, Color SM 2120 B-2011, Alkalinity SM 2320 B-2011, Specific Conductance SM 2510 B-2011, Residue-filterable (TDS) SM 2540 C, Calcium Hardness (CaCO2) SM 3500-Ca B-2011, TRC SM 4500 Cl G-2011, pH SM 4500 H=B-2011, E.Coli, Total Coliform. Non-Potable Water: Metals EPA 200.7, Strontium EPA 200.8, Chlorate EPA 300.0, Cyanide EPA 335.4, Phenolics EPA 420.4, 2-Methyl-4,6-Dinitrophenol EPA 625.1, Propane RSK-175, Specific Conductance SM 2510 B-2011, Salinity SM2520 B, Residue- total SM 2540 B, Sulfite SM 4500 SO32- B-2011, Amenable Cyanide SM 4500-CN- G-2011, BOD & CBOD SM 5210 B, MBAS SM 5540 C-2011, Boron & Titanium SW-846 6010D, Boron, Molybdenum, & Titanium SW-846 6020B, Alcohols & Glycols SW-846 8015C, Pentachlorophenol SW-846 8151A, Ethyl Acetate, Hexane, & n-Hexane SW-846 8260D, SVOC 1,4-Dioxane, 4-Dimethyl aminoazobenzene, 1,4-Naphthoquinone, 3,5-Dinitroaniline, PETN SW-846 8270E, Amenable Cyanide SW-846 9012B. Solid and Chemical Materials: Boron & Titanium SW-846 6010D, Molybdenum SW-846 6020B, Ethylene Glycol SW-846 8015B, Pentachlorophenol SW-846 8151A, Chloroprene SW-846 8260B, SVOC 1,4-Dioxane, 1,3,5-Trinitrobenzene, 1,4- Naphthoquinone, 1,4-Phenylenediamine, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 3-Methylcholanthrene, 4-Aminobiphenyl, 4-Dimethyl aminoazobenzene, 4-Nitroquinoline-1-oxide, 7,12-Dimethylbenzo(a)anthracene, Chlorobenzilate, Diallate, Ethyl methanesulfonate, Isodrin, Isosafrole, Methyl methanesulfonate, n-Nitrosomethylethylamine, n-Nitrosomorpholine, n-Nitrosopiperidine, Piperonyl butoxide, Pronamide, Safrole, 3,5- Dinitroaniline, PETN SW-846 8270E, Oil & Grease SW-846 9071B.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18. If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Volatiles
The LCS associated with batch 87040 had 1,1-Dichloroethane recovered below the acceptance limits. This demonstrates a low bias on analytical results. Results for this compound in the samples associated with this batch should be considered estimated.

Surrogate recovery for the following sample was outside the upper control limit: YI30001-005, YI30001-007. These samples were re-analyzed outside of holding time and all data has been reported.

Samples YI30001-010, YI30001-011, YI30001-014 had surrogates recovered above the acceptance limits. This reflects a high bias for compounds associated with this surrogate. The data has been reported.

Pesticides
The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 86556 exceeded acceptance criteria for the following analyte: Toxaphene. This analyte was biased high and was not detected in the samples affected.

Semivolatiles
The MS/MSD associated with samples YI30001-001, YI30001-010, YI30001-011 had compounds recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

## Manual Integration Summary

## Arcadis U.S., Inc.

**Lot Number: YI30001**

**Project Name: JBC Air, LTM**

**Project Number:**

Where applicable, analytes for which manual integration occurred have been flagged with the following:

| Qualifier | Technical Justification | Qualifier | Technical Justification | Qualifier | Technical Justification |
|---|---|---|---|---|---|
| M-01 | Split peak | M-07 | Low fit | M-13 | Error |
| M-02 | Peak tailing | M-08 | Peak not found | M-14 | Baseline |
| M-03 | Incorrect auto integration | M-09 | Analyte not Identified by the Data System | M-15 | Other |
| M-04 | Poor chromatography | M-10 | Analyte misidentified by the Data System | M-16 | Retention time shift |
| M-05 | Manually assigned peak | M-11 | Invalid integration | M-17 | Shouldering |
| M-06 | Wrong isomer | M-12 | Wrong peak | | |

A summary of instances where manual integration occurred is included below:

| Method | Sample | Run Number | Parameter | Qualifier |
|---|---|---|---|---|
| 8260D | YI30001-007 | 1 | cis-1,2-Dichloroethene | M-03 |
| 8260D | YI30001-007 | 2 | Chloromethane (Methyl chloride) | M-03 |
| 8260D | YI30001-017 | 1 | Acetone | M-03 |
| 8260D | YQ87040-002 | 1 | Acetone | M-03 |
| 8260D | YQ87040-002 | 1 | Dichlorodifluoromethane | M-03 |
| 8260D | YQ87040-002 | 1 | Trichlorofluoromethane | M-03 |
| 8260D | YQ87294-003 | 1 | Trichlorofluoromethane | M-03 |
| 8260D | YQ87165-002 | 1 | Acetone | M-03 |
| 8260D | YQ87165-002 | 1 | Dichlorodifluoromethane | M-03 |
| 8260D | YQ87165-002 | 1 | Methyl acetate | M-03 |
| 8260D | YQ87165-002 | 1 | Trichlorofluoromethane | M-03 |

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

## Sample Summary
## Arcadis U.S., Inc.
### Lot Number: YI30001
### Project Name: JBC Air, LTM
### Project Number:

| Sample Number | Sample ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| 001 | Z2-02_0923 | Aqueous | 09/28/2023 1546 | 09/29/2023 |
| 002 | Z2-04_0923 | Aqueous | 09/28/2023 1451 | 09/29/2023 |
| 003 | Z2-04_0923-a | Aqueous | 09/28/2023 1451 | 09/29/2023 |
| 004 | Z2-12_0923 | Aqueous | 09/29/2023 0920 | 09/29/2023 |
| 005 | Z2-32_0923 | Aqueous | 09/29/2023 1025 | 09/29/2023 |
| 006 | Z2-36_0923 | Aqueous | 09/28/2023 1301 | 09/29/2023 |
| 007 | Z2-T3_0923 | Aqueous | 09/29/2023 1255 | 09/29/2023 |
| 008 | Z2-138-01_0923 | Aqueous | 09/29/2023 1200 | 09/29/2023 |
| 009 | TB08_0923-C | Aqueous | 09/28/2023 1301 | 09/29/2023 |
| 010 | Z2-11_0923 | Aqueous | 09/28/2023 1655 | 09/29/2023 |
| 011 | Z2-45_0923 | Aqueous | 09/28/2023 1310 | 09/29/2023 |
| 012 | Z2-45_0923-a | Aqueous | 09/28/2023 1310 | 09/29/2023 |
| 013 | Z2-50_0923 | Aqueous | 09/28/2023 1515 | 09/29/2023 |
| 014 | Z2-52R_0923 | Aqueous | 09/28/2023 1600 | 09/29/2023 |
| 015 | Z2-53_0923 | Aqueous | 09/28/2023 1440 | 09/29/2023 |
| 016 | Z2-54_0923 | Aqueous | 09/29/2023 1415 | 09/29/2023 |
| 017 | MW-01-129_0923 | Aqueous | 09/29/2023 1555 | 09/29/2023 |
| 018 | MW-01-129_0923-a | Aqueous | 09/29/2023 1555 | 09/29/2023 |

(18 samples)

## Detection Summary

## Arcadis U.S., Inc.

### Lot Number: YI30001

### Project Name: JBC Air, LTM

### Project Number:

| Sample | Sample ID | Matrix | Parameter | Method | Result | Q | Units | Page |
|---|---|---|---|---|---|---|---|---|
| 002 | Z2-04_0923 | Aqueous | cis-1,2-Dichloroethene | 8260D | 11 | | ug/L | 14 |
| 002 | Z2-04_0923 | Aqueous | trans-1,2-Dichloroethene | 8260D | 0.51 | J | ug/L | 14 |
| 002 | Z2-04_0923 | Aqueous | Trichloroethene | 8260D | 3.9 | | ug/L | 15 |
| 003 | Z2-04_0923-a | Aqueous | cis-1,2-Dichloroethene | 8260D | 11 | | ug/L | 17 |
| 003 | Z2-04_0923-a | Aqueous | trans-1,2-Dichloroethene | 8260D | 0.45 | J | ug/L | 17 |
| 003 | Z2-04_0923-a | Aqueous | Trichloroethene | 8260D | 3.9 | | ug/L | 18 |
| 006 | Z2-36_0923 | Aqueous | cis-1,2-Dichloroethene | 8260D | 1.5 | | ug/L | 27 |
| 007 | Z2-T3_0923 | Aqueous | Tetrachloroethene | 8260D | 0.47 | JQ | ug/L | 30 |
| 007 | Z2-T3_0923 | Aqueous | Trichloroethene | 8260D | 0.60 | JQ | ug/L | 31 |
| 010 | Z2-11_0923 | Aqueous | cis-1,2-Dichloroethene | 8260D | 0.79 | JQ | ug/L | 38 |
| 011 | Z2-45_0923 | Aqueous | trans-1,2-Dichloroethene | 8260D | 0.81 | JQ | ug/L | 41 |
| 011 | Z2-45_0923 | Aqueous | Vinyl chloride | 8260D | 26 | Q | ug/L | 42 |
| 012 | Z2-45_0923-a | Aqueous | trans-1,2-Dichloroethene | 8260D | 0.83 | J | ug/L | 44 |
| 012 | Z2-45_0923-a | Aqueous | Vinyl chloride | 8260D | 25 | | ug/L | 45 |
| 013 | Z2-50_0923 | Aqueous | cis-1,2-Dichloroethene | 8260D | 0.64 | J | ug/L | 46 |
| 017 | MW-01-129_0923 | Aqueous | Ethylbenzene | 8260D | 8.3 | | ug/L | 58 |
| 017 | MW-01-129_0923 | Aqueous | Isopropylbenzene | 8260D | 1.8 | | ug/L | 58 |
| 017 | MW-01-129_0923 | Aqueous | Naphthalene | 8260D | 62 | | ug/L | 58 |
| 017 | MW-01-129_0923 | Aqueous | Xylenes (total) | 8260D | 3.6 | | ug/L | 59 |
| 017 | MW-01-129_0923 | Aqueous | Naphthalene | 8270E (SIM) | 32 | | ug/L | 60 |
| 018 | MW-01-129_0923-a | Aqueous | Cyclohexane | 8260D | 0.47 | J | ug/L | 61 |
| 018 | MW-01-129_0923-a | Aqueous | Ethylbenzene | 8260D | 8.6 | | ug/L | 61 |
| 018 | MW-01-129_0923-a | Aqueous | Isopropylbenzene | 8260D | 1.8 | | ug/L | 61 |
| 018 | MW-01-129_0923-a | Aqueous | Naphthalene | 8260D | 60 | | ug/L | 61 |
| 018 | MW-01-129_0923-a | Aqueous | Xylenes (total) | 8260D | 3.6 | | ug/L | 62 |
| 018 | MW-01-129_0923-a | Aqueous | Naphthalene | 8270E (SIM) | 30 | | ug/L | 63 |

(26 detections)

# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-001**

Description: **Z2-02_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1546** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0350 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UL | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-001**

Description: **Z2-02_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1546** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0350 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 105 | 81-118 |
| Bromofluorobenzene | | 90 | 85-114 |
| Toluene-d8 | | 97 | 89-112 |
| Dibromofluoromethane | | 108 | 80-119 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-001**

Description: **Z2-02_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1546** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/12/2023 1732 | JCG | 10/03/2023 1330 | 86383 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.098 | US | 0.98 | 0.098 | 0.027 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 92 | 23-154 |
| 2-Methylnaphthalene-d10 | | 79 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Organochlorine Pesticides by GC

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-001**

Description: **Z2-02_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1546** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8081B | 1 | 10/04/2023 2232 | MEZ | 10/03/2023 1530 | 86402 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Aldrin | 309-00-2 | 8081B | 0.040 | U | 0.050 | 0.040 | 0.020 | ug/L | 1 |
| gamma-BHC (Lindane) | 58-89-9 | 8081B | 0.040 | U | 0.050 | 0.040 | 0.017 | ug/L | 1 |
| alpha-BHC | 319-84-6 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| beta-BHC | 319-85-7 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| delta-BHC | 319-86-8 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| cis-Chlordane | 5103-71-9 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| trans-Chlordane | 5103-74-2 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| 4,4'-DDD | 72-54-8 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| 4,4'-DDE | 72-55-9 | 8081B | 0.040 | U | 0.050 | 0.040 | 0.020 | ug/L | 1 |
| 4,4'-DDT | 50-29-3 | 8081B | 0.040 | U | 0.050 | 0.040 | 0.020 | ug/L | 1 |
| Dieldrin | 60-57-1 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| Endosulfan I | 959-98-8 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| Endosulfan II | 33213-65-9 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| Endosulfan sulfate | 1031-07-8 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| Endrin | 72-20-8 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| Endrin aldehyde | 7421-93-4 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| Endrin ketone | 53494-70-5 | 8081B | 0.030 | U | 0.040 | 0.030 | 0.015 | ug/L | 1 |
| Heptachlor | 76-44-8 | 8081B | 0.050 | U | 0.060 | 0.050 | 0.021 | ug/L | 1 |
| Heptachlor epoxide | 1024-57-3 | 8081B | 0.040 | U | 0.050 | 0.040 | 0.016 | ug/L | 1 |
| Methoxychlor | 72-43-5 | 8081B | 0.050 | U | 0.16 | 0.050 | 0.021 | ug/L | 1 |
| Toxaphene | 8001-35-2 | 8081B | 0.60 | UL | 0.80 | 0.60 | 0.30 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Decachlorobiphenyl | | 57 | 20-122 |
| Tetrachloro-m-xylene | | 93 | 44-124 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-002**

Description: **Z2-04_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1451** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0415 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UL | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **cis-1,2-Dichloroethene** | **156-59-2** | **8260D** | **11** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| **trans-1,2-Dichloroethene** | **156-60-5** | **8260D** | **0.51** | **J** | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-002**

Description: **Z2-04_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1451** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0415 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Trichloroethene** | **79-01-6** | **8260D** | **3.9** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 116 | 81-118 |
| Bromofluorobenzene | | 99 | 85-114 |
| Toluene-d8 | | 103 | 89-112 |
| Dibromofluoromethane | | 118 | 80-119 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-002**

Description: **Z2-04_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1451** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 2 | 10/12/2023 1756 | JCG | 10/03/2023 1330 | 86383 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.21 | U | 2.1 | 0.21 | 0.059 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 81 | 23-154 |
| 2-Methylnaphthalene-d10 | | 76 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-003**

Description: **Z2-04_0923-a** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1451** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0440 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UL | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **cis-1,2-Dichloroethene** | **156-59-2** | **8260D** | **11** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| **trans-1,2-Dichloroethene** | **156-60-5** | **8260D** | **0.45** | **J** | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-003**

Description: **Z2-04_0923-a** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1451** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0440 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Trichloroethene** | **79-01-6** | **8260D** | **3.9** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 107 | 81-118 |
| Bromofluorobenzene | | 87 | 85-114 |
| Toluene-d8 | | 99 | 89-112 |
| Dibromofluoromethane | | 113 | 80-119 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-004**

Description: **Z2-12_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 0920** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0504 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UL | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-004**

Description: **Z2-12_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 0920** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0504 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 118 | 81-118 |
| Bromofluorobenzene | | 92 | 85-114 |
| Toluene-d8 | | 100 | 89-112 |
| Dibromofluoromethane | | 118 | 80-119 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-004**

Description: **Z2-12_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 0920** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/12/2023 1821 | JCG | 10/03/2023 1330 | 86383 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.099 | U | 0.99 | 0.099 | 0.028 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 104 | 23-154 |
| 2-Methylnaphthalene-d10 | | 81 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-005**

Description: **Z2-32_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1025** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/13/2023 0012 | AMR2 | | 87294 |
| 2 | 5030B | 8260D | 1 | 10/23/2023 1318 | CCO | | 88182 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | UQ | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | UQ | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | UQ | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | UQ | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | UQ | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | UQ | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | UQ | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | UQ | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
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U = Not detected at or above the LOD
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P = The RPD between two GC columns exceeds 40%
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W = Reported on wet weight basis
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S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-005**

Description: **Z2-32_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1025** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/13/2023 0012 | AMR2 | | 87294 |
| 2 | 5030B | 8260D | 1 | 10/23/2023 1318 | CCO | | 88182 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits | Q | Run 2 % Recovery | Acceptance Limits |
|---|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 111 | 81-118 | HN | 123 | 81-118 |
| Bromofluorobenzene | | 91 | 85-114 | H | 102 | 85-114 |
| Toluene-d8 | N | 117 | 89-112 | H | 107 | 89-112 |
| Dibromofluoromethane | | 113 | 80-119 | H | 114 | 80-119 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-005**

Description: **Z2-32_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1025** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/13/2023 0012 | AMR2 | | 87294 |
| 2 | 5030B | 8260D | 1 | 10/23/2023 1318 | CCO | | 88182 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | UHQ | 20 | 10 | 5.0 | ug/L | 2 |
| Benzene | 71-43-2 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Bromoform | 75-25-2 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | UHQ | 2.0 | 0.80 | 0.40 | ug/L | 2 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | UHQ | 10 | 4.0 | 2.0 | ug/L | 2 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | UHQ | 2.0 | 0.80 | 0.40 | ug/L | 2 |
| **Chloroform** | **67-66-3** | **8260D** | **0.96** | **HJQ** | **1.0** | 0.80 | **0.40** | **ug/L** | **2** |
| **Chloromethane (Methyl chloride)** | **74-87-3** | **8260D** | **1.7** | **HJQ** | **2.0** | 1.0 | **0.50** | **ug/L** | **2** |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | UHQ | 2.0 | 1.2 | 0.60 | ug/L | 2 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | UHQ | 10 | 4.0 | 2.0 | ug/L | 2 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | UHQ | 10 | 4.0 | 2.0 | ug/L | 2 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | UHQ | 5.0 | 0.80 | 0.40 | ug/L | 2 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Styrene | 100-42-5 | 8260D | 0.82 | UHQ | 1.0 | 0.82 | 0.41 | ug/L | 2 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Toluene | 108-88-3 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | UHQ | 1.0 | 0.84 | 0.42 | ug/L | 2 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-005**

Description: **Z2-32_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1025** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/13/2023 0012 | AMR2 | | 87294 |
| 2 | 5030B | 8260D | 1 | 10/23/2023 1318 | CCO | | 88182 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits | Q | Run 2 % Recovery | Acceptance Limits |
|---|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 111 | 81-118 | HN | 123 | 81-118 |
| Bromofluorobenzene | | 91 | 85-114 | H | 102 | 85-114 |
| Toluene-d8 | N | 117 | 89-112 | H | 107 | 89-112 |
| Dibromofluoromethane | | 113 | 80-119 | H | 114 | 80-119 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-005**

Description: **Z2-32_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1025** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/12/2023 1845 | JCG | 10/03/2023 1330 | 86383 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.10 | U | 1.0 | 0.10 | 0.028 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 83 | 23-154 |
| 2-Methylnaphthalene-d10 | | 78 | 15-139 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-006**

Description: **Z2-36_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1301** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0529 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UL | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **cis-1,2-Dichloroethene** | **156-59-2** | **8260D** | **1.5** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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LOD = Limit of Detection
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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-006**

Description: **Z2-36_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1301** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0529 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 108 | 81-118 |
| Bromofluorobenzene | | 89 | 85-114 |
| Toluene-d8 | | 99 | 89-112 |
| Dibromofluoromethane | | 109 | 80-119 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-006**

Description: **Z2-36_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1301** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/12/2023 1909 | JCG | 10/03/2023 1330 | 86383 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.099 | U | 0.99 | 0.099 | 0.028 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 103 | 23-154 |
| 2-Methylnaphthalene-d10 | | 83 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-007**

Description: **Z2-T3_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1255** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/13/2023 0037 | AMR2 | | 87294 |
| 2 | 5030B | 8260D | 1 | 10/23/2023 1351 | CCO | | 88182 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | UQ | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | UQ | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | UQ | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | UQ | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | UQ | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | UQM-03 | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | UQ | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | UQ | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Tetrachloroethene** | **127-18-4** | **8260D** | **0.47** | **JQ** | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| Toluene | 108-88-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | UQ | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-007**

Description: **Z2-T3_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1255** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/13/2023 0037 | AMR2 | | 87294 |
| 2 | 5030B | 8260D | 1 | 10/23/2023 1351 | CCO | | 88182 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Trichloroethene** | **79-01-6** | **8260D** | **0.60** | **JQ** | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits | Q | Run 2 % Recovery | Acceptance Limits |
|---|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 110 | 81-118 | HN | 124 | 81-118 |
| Bromofluorobenzene | | 90 | 85-114 | H | 103 | 85-114 |
| Toluene-d8 | N | 117 | 89-112 | H | 110 | 89-112 |
| Dibromofluoromethane | | 113 | 80-119 | H | 115 | 80-119 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-007**

Description: **Z2-T3_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1255** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/13/2023 0037 | AMR2 | | 87294 |
| 2 | 5030B | 8260D | 1 | 10/23/2023 1351 | CCO | | 88182 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | UHQ | 20 | 10 | 5.0 | ug/L | 2 |
| Benzene | 71-43-2 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Bromoform | 75-25-2 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | UHQ | 2.0 | 0.80 | 0.40 | ug/L | 2 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | UHQ | 10 | 4.0 | 2.0 | ug/L | 2 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | UHQ | 2.0 | 0.80 | 0.40 | ug/L | 2 |
| **Chloroform** | **67-66-3** | **8260D** | **0.44** | **HJQ** | **1.0** | 0.80 | **0.40** | **ug/L** | **2** |
| **Chloromethane (Methyl chloride)** | **74-87-3** | **8260D** | **0.79** | **HJQM-03** | **2.0** | 1.0 | **0.50** | **ug/L** | **2** |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | UHQ | 2.0 | 1.2 | 0.60 | ug/L | 2 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | UHQ | 10 | 4.0 | 2.0 | ug/L | 2 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | UHQ | 10 | 4.0 | 2.0 | ug/L | 2 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | UHQ | 5.0 | 0.80 | 0.40 | ug/L | 2 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Styrene | 100-42-5 | 8260D | 0.82 | UHQ | 1.0 | 0.82 | 0.41 | ug/L | 2 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| **Tetrachloroethene** | **127-18-4** | **8260D** | **0.50** | **HJQ** | **1.0** | 0.80 | **0.40** | **ug/L** | **2** |
| Toluene | 108-88-3 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | UHQ | 1.0 | 0.84 | 0.42 | ug/L | 2 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-007**

Description: **Z2-T3_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1255** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/13/2023 0037 | AMR2 | | 87294 |
| 2 | 5030B | 8260D | 1 | 10/23/2023 1351 | CCO | | 88182 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| **Trichloroethene** | **79-01-6** | **8260D** | **0.53** | **HJQ** | **1.0** | 0.80 | **0.40** | **ug/L** | **2** |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | UHQ | 1.0 | 0.80 | 0.40 | ug/L | 2 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits | Q | Run 2 % Recovery | Acceptance Limits |
|---|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 110 | 81-118 | HN | 124 | 81-118 |
| Bromofluorobenzene | | 90 | 85-114 | H | 103 | 85-114 |
| Toluene-d8 | N | 117 | 89-112 | H | 110 | 89-112 |
| Dibromofluoromethane | | 113 | 80-119 | H | 115 | 80-119 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
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U = Not detected at or above the LOD
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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-007**

Description: **Z2-T3_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1255** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/12/2023 1933 | JCG | 10/03/2023 1330 | 86383 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.099 | U | 0.99 | 0.099 | 0.028 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 92 | 23-154 |
| 2-Methylnaphthalene-d10 | | 86 | 15-139 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-008**

Description: **Z2-138-01_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1200** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/13/2023 1450 | JCG | 10/05/2023 1134 | 86606 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.098 | U | 0.98 | 0.098 | 0.027 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 108 | 23-154 |
| 2-Methylnaphthalene-d10 | | 90 | 15-139 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-009**

Description: **TB08_0923-C** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1301** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0554 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UL | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
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U = Not detected at or above the LOD
N = Recovery is out of criteria
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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-009**

Description: **TB08_0923-C** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1301** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0554 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 105 | 81-118 |
| Bromofluorobenzene | | 89 | 85-114 |
| Toluene-d8 | | 95 | 89-112 |
| Dibromofluoromethane | | 107 | 80-119 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-010**

Description: **Z2-11_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1655** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0619 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | UQ | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | UQ | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | UQ | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | UQ | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | UQ | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UQL | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **cis-1,2-Dichloroethene** | **156-59-2** | **8260D** | **0.79** | **JQ** | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | UQ | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | UQ | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | UQ | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-010**

Description: **Z2-11_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1655** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0619 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | N | 119 | 81-118 |
| Bromofluorobenzene | | 91 | 85-114 |
| Toluene-d8 | | 101 | 89-112 |
| Dibromofluoromethane | | 119 | 80-119 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-010**

Description: **Z2-11_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1655** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/13/2023 1514 | JCG | 10/05/2023 1134 | 86606 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.098 | US | 0.98 | 0.098 | 0.027 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 95 | 23-154 |
| 2-Methylnaphthalene-d10 | | 81 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-011**

Description: **Z2-45_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1310** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0644 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | UQ | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | UQ | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | UQ | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | UQ | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | UQ | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UQL | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **trans-1,2-Dichloroethene** | **156-60-5** | **8260D** | **0.81** | **JQ** | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | UQ | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | UQ | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | UQ | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
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S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-011**

Description: **Z2-45_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1310** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0644 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Vinyl chloride** | **75-01-4** | **8260D** | **26** | **Q** | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | N | 120 | 81-118 |
| Bromofluorobenzene | | 95 | 85-114 |
| Toluene-d8 | | 103 | 89-112 |
| Dibromofluoromethane | | 119 | 80-119 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-011**

Description: **Z2-45_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1310** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/13/2023 1627 | JCG | 10/05/2023 1134 | 86606 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.097 | US | 0.97 | 0.097 | 0.027 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 93 | 23-154 |
| 2-Methylnaphthalene-d10 | | 75 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-012**

Description: **Z2-45_0923-a** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1310** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0709 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UL | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **trans-1,2-Dichloroethene** | **156-60-5** | **8260D** | **0.83** | **J** | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-012**

Description: **Z2-45_0923-a** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1310** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 0709 | DPH | | 87040 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Vinyl chloride** | **75-01-4** | **8260D** | **25** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 118 | 81-118 |
| Bromofluorobenzene | | 93 | 85-114 |
| Toluene-d8 | | 103 | 89-112 |
| Dibromofluoromethane | | 119 | 80-119 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-013**

Description: **Z2-50_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1515** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 2244 | CCO | | 87138 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **cis-1,2-Dichloroethene** | **156-59-2** | **8260D** | **0.64** | **J** | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-013**

Description: **Z2-50_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1515** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 2244 | CCO | | 87138 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 116 | 81-118 |
| Bromofluorobenzene | | 103 | 85-114 |
| Toluene-d8 | | 105 | 89-112 |
| Dibromofluoromethane | | 105 | 80-119 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-013**

Description: **Z2-50_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1515** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/13/2023 1740 | JCG | 10/05/2023 1134 | 86606 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.097 | U | 0.97 | 0.097 | 0.027 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 92 | 23-154 |
| 2-Methylnaphthalene-d10 | | 74 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-014**

Description: **Z2-52R_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1600** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/12/2023 0456 | CCO | | 87138 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | UQ | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | UQ | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | UQ | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | UQ | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | UQ | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | UQ | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | UQ | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | UQ | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | UQ | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-014**

Description: **Z2-52R_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1600** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/12/2023 0456 | CCO | | 87138 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | UQ | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | N | 119 | 81-118 |
| Bromofluorobenzene | | 101 | 85-114 |
| Toluene-d8 | | 105 | 89-112 |
| Dibromofluoromethane | | 108 | 80-119 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-014**

Description: **Z2-52R_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1600** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/13/2023 1804 | JCG | 10/05/2023 1134 | 86606 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.098 | U | 0.98 | 0.098 | 0.027 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 93 | 23-154 |
| 2-Methylnaphthalene-d10 | | 77 | 15-139 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-015**

Description: **Z2-53_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1440** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 2309 | CCO | | 87138 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-015**

Description: **Z2-53_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1440** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 2309 | CCO | | 87138 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 117 | 81-118 |
| Bromofluorobenzene | | 101 | 85-114 |
| Toluene-d8 | | 104 | 89-112 |
| Dibromofluoromethane | | 106 | 80-119 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-015**

Description: **Z2-53_0923** Matrix: **Aqueous**

Date Sampled: **09/28/2023 1440** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/13/2023 1829 | JCG | 10/05/2023 1134 | 86606 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.098 | U | 0.98 | 0.098 | 0.027 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 92 | 23-154 |
| 2-Methylnaphthalene-d10 | | 78 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-016**

Description: **Z2-54_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1415** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 1541 | DPH | | 87165 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Ethylbenzene | 100-41-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Isopropylbenzene | 98-82-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-016**

Description: **Z2-54_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1415** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 1541 | DPH | | 87165 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Xylenes (total) | 1330-20-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 113 | 81-118 |
| Bromofluorobenzene | | 94 | 85-114 |
| Toluene-d8 | | 101 | 89-112 |
| Dibromofluoromethane | | 114 | 80-119 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-016**

Description: **Z2-54_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1415** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 1 | 10/13/2023 1853 | JCG | 10/05/2023 1134 | 86606 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 8270E (SIM) | 0.097 | U | 0.97 | 0.097 | 0.027 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 100 | 23-154 |
| 2-Methylnaphthalene-d10 | | 86 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-017**

Description: **MW-01-129_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1555** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 1606 | DPH | | 87165 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | UM-03 | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| Cyclohexane | 110-82-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Ethylbenzene** | **100-41-4** | **8260D** | **8.3** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| **Isopropylbenzene** | **98-82-8** | **8260D** | **1.8** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Naphthalene** | **91-20-3** | **8260D** | **62** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
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DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-017**

Description: **MW-01-129_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1555** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 1606 | DPH | | 87165 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Xylenes (total)** | **1330-20-7** | **8260D** | **3.6** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 114 | 81-118 |
| Bromofluorobenzene | | 104 | 85-114 |
| Toluene-d8 | | 103 | 89-112 |
| Dibromofluoromethane | | 113 | 80-119 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-017**

Description: **MW-01-129_0923** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1555** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 20 | 10/16/2023 1253 | JCG | 10/05/2023 1134 | 86606 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| **Naphthalene** | **91-20-3** | **8270E (SIM)** | **32** | | **6.5** | 2.0 | **0.97** | **ug/L** | **1** |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 95 | 23-154 |
| 2-Methylnaphthalene-d10 | | 81 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-018**

Description: **MW-01-129_0923-a** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1555** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 1359 | DPH | | 87165 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | 8260D | 10 | U | 20 | 10 | 5.0 | ug/L | 1 |
| Benzene | 71-43-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromodichloromethane | 75-27-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromoform | 75-25-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Bromomethane (Methyl bromide) | 74-83-9 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| 2-Butanone (MEK) | 78-93-3 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Carbon disulfide | 75-15-0 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Carbon tetrachloride | 56-23-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chlorobenzene | 108-90-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroethane | 75-00-3 | 8260D | 0.80 | U | 2.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloroform | 67-66-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Chloromethane (Methyl chloride) | 74-87-3 | 8260D | 1.0 | U | 2.0 | 1.0 | 0.50 | ug/L | 1 |
| **Cyclohexane** | **110-82-7** | **8260D** | **0.47** | **J** | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| 1,2-Dibromo-3-chloropropane (DBCP) | 96-12-8 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dibromochloromethane | 124-48-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dibromoethane (EDB) | 106-93-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichlorobenzene | 95-50-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,3-Dichlorobenzene | 541-73-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,4-Dichlorobenzene | 106-46-7 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Dichlorodifluoromethane | 75-71-8 | 8260D | 1.2 | U | 2.0 | 1.2 | 0.60 | ug/L | 1 |
| 1,1-Dichloroethane | 75-34-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloroethane | 107-06-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1-Dichloroethene | 75-35-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,2-Dichloroethene | 156-59-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,2-Dichloroethene | 156-60-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,2-Dichloropropane | 78-87-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| cis-1,3-Dichloropropene | 10061-01-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| trans-1,3-Dichloropropene | 10061-02-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Ethylbenzene** | **100-41-4** | **8260D** | **8.6** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| 2-Hexanone | 591-78-6 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| **Isopropylbenzene** | **98-82-8** | **8260D** | **1.8** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| Methyl acetate | 79-20-9 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Methyl tertiary butyl ether (MTBE) | 1634-04-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 4-Methyl-2-pentanone | 108-10-1 | 8260D | 4.0 | U | 10 | 4.0 | 2.0 | ug/L | 1 |
| Methylcyclohexane | 108-87-2 | 8260D | 0.80 | U | 5.0 | 0.80 | 0.40 | ug/L | 1 |
| Methylene chloride | 75-09-2 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Naphthalene** | **91-20-3** | **8260D** | **60** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |
| Styrene | 100-42-5 | 8260D | 0.82 | U | 1.0 | 0.82 | 0.41 | ug/L | 1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Tetrachloroethene | 127-18-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Toluene | 108-88-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 76-13-1 | 8260D | 0.84 | U | 1.0 | 0.84 | 0.42 | ug/L | 1 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| 1,1,1-Trichloroethane | 71-55-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
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LOD = Limit of Detection
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# Volatile Organic Compounds by GC/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-018**

Description: **MW-01-129_0923-a** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1555** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 10/11/2023 1359 | DPH | | 87165 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 79-00-5 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichloroethene | 79-01-6 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Trichlorofluoromethane | 75-69-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| Vinyl chloride | 75-01-4 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |
| **Xylenes (total)** | **1330-20-7** | **8260D** | **3.6** | | **1.0** | 0.80 | **0.40** | **ug/L** | **1** |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 112 | 81-118 |
| Bromofluorobenzene | | 100 | 85-114 |
| Toluene-d8 | | 101 | 89-112 |
| Dibromofluoromethane | | 111 | 80-119 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: **Arcadis U.S., Inc.** Laboratory ID: **YI30001-018**

Description: **MW-01-129_0923-a** Matrix: **Aqueous**

Date Sampled: **09/29/2023 1555** Project Name: **JBC Air, LTM**

Date Received: **09/29/2023** Project Number:

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 20 | 10/16/2023 1318 | JCG | 10/05/2023 1134 | 86606 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| **Naphthalene** | **91-20-3** | **8270E (SIM)** | **30** | | **6.3** | 1.9 | **0.95** | **ug/L** | **1** |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 91 | 23-154 |
| 2-Methylnaphthalene-d10 | | 77 | 15-139 |

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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# QC Summary

# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** YQ87040-001
**Batch:** 87040
**Analytical Method:** 8260D
**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Acetone | 10 | U | 1 | 20 | 10 | 5.0 | ug/L | 10/10/2023 2224 |
| Benzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Bromodichloromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Bromoform | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Bromomethane (Methyl bromide) | 0.80 | U | 1 | 2.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 2-Butanone (MEK) | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/10/2023 2224 |
| Carbon disulfide | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Carbon tetrachloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Chlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Chloroethane | 0.80 | U | 1 | 2.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Chloroform | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Chloromethane (Methyl chloride) | 1.0 | U | 1 | 2.0 | 1.0 | 0.50 | ug/L | 10/10/2023 2224 |
| Cyclohexane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Dibromochloromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 1,2-Dibromoethane (EDB) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 1,2-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 1,3-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 1,4-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Dichlorodifluoromethane | 1.2 | U | 1 | 2.0 | 1.2 | 0.60 | ug/L | 10/10/2023 2224 |
| 1,1-Dichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 1,2-Dichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 1,1-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| cis-1,2-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| trans-1,2-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 1,2-Dichloropropane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| cis-1,3-Dichloropropene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| trans-1,3-Dichloropropene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Ethylbenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 2-Hexanone | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/10/2023 2224 |
| Isopropylbenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Methyl acetate | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Methyl tertiary butyl ether (MTBE) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 4-Methyl-2-pentanone | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/10/2023 2224 |
| Methylcyclohexane | 0.80 | U | 1 | 5.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Methylene chloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Naphthalene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Styrene | 0.82 | U | 1 | 1.0 | 0.82 | 0.41 | ug/L | 10/10/2023 2224 |
| 1,1,2,2-Tetrachloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Tetrachloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Toluene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.84 | U | 1 | 1.0 | 0.84 | 0.42 | ug/L | 10/10/2023 2224 |
| 1,2,4-Trichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| 1,1,1-Trichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** YQ87040-001
**Batch:** 87040
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Trichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Trichlorofluoromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Vinyl chloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |
| Xylenes (total) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/10/2023 2224 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 109 | 81-118 |
| Bromofluorobenzene | | 92 | 85-114 |
| Toluene-d8 | | 99 | 89-112 |
| Dibromofluoromethane | | 111 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** YQ87040-002
**Batch:** 87040
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acetone | 100 | 94 | M-03 | 1 | 94 | 39-160 | 10/10/2023 2134 |
| Benzene | 50 | 45 | | 1 | 91 | 79-120 | 10/10/2023 2134 |
| Bromodichloromethane | 50 | 45 | | 1 | 89 | 79-125 | 10/10/2023 2134 |
| Bromoform | 50 | 46 | | 1 | 93 | 66-130 | 10/10/2023 2134 |
| Bromomethane (Methyl bromide) | 50 | 45 | | 1 | 89 | 53-141 | 10/10/2023 2134 |
| 2-Butanone (MEK) | 100 | 82 | | 1 | 82 | 56-143 | 10/10/2023 2134 |
| Carbon disulfide | 50 | 41 | | 1 | 81 | 64-133 | 10/10/2023 2134 |
| Carbon tetrachloride | 50 | 43 | | 1 | 87 | 72-136 | 10/10/2023 2134 |
| Chlorobenzene | 50 | 46 | | 1 | 91 | 82-118 | 10/10/2023 2134 |
| Chloroethane | 50 | 41 | | 1 | 83 | 60-138 | 10/10/2023 2134 |
| Chloroform | 50 | 39 | | 1 | 79 | 79-124 | 10/10/2023 2134 |
| Chloromethane (Methyl chloride) | 50 | 43 | | 1 | 86 | 50-139 | 10/10/2023 2134 |
| Cyclohexane | 50 | 36 | | 1 | 72 | 71-130 | 10/10/2023 2134 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 50 | 45 | | 1 | 90 | 62-128 | 10/10/2023 2134 |
| Dibromochloromethane | 50 | 49 | | 1 | 98 | 74-126 | 10/10/2023 2134 |
| 1,2-Dibromoethane (EDB) | 50 | 49 | | 1 | 99 | 77-121 | 10/10/2023 2134 |
| 1,2-Dichlorobenzene | 50 | 46 | | 1 | 92 | 80-119 | 10/10/2023 2134 |
| 1,3-Dichlorobenzene | 50 | 47 | | 1 | 94 | 80-119 | 10/10/2023 2134 |
| 1,4-Dichlorobenzene | 50 | 45 | | 1 | 90 | 79-118 | 10/10/2023 2134 |
| Dichlorodifluoromethane | 50 | 42 | M-03 | 1 | 84 | 32-152 | 10/10/2023 2134 |
| 1,1-Dichloroethane | 50 | 38 | N | 1 | 76 | 77-125 | 10/10/2023 2134 |
| 1,2-Dichloroethane | 50 | 45 | | 1 | 90 | 73-128 | 10/10/2023 2134 |
| 1,1-Dichloroethene | 50 | 41 | | 1 | 82 | 71-131 | 10/10/2023 2134 |
| cis-1,2-Dichloroethene | 50 | 40 | | 1 | 79 | 78-123 | 10/10/2023 2134 |
| trans-1,2-Dichloroethene | 50 | 42 | | 1 | 84 | 75-124 | 10/10/2023 2134 |
| 1,2-Dichloropropane | 50 | 43 | | 1 | 87 | 78-122 | 10/10/2023 2134 |
| cis-1,3-Dichloropropene | 50 | 44 | | 1 | 89 | 75-124 | 10/10/2023 2134 |
| trans-1,3-Dichloropropene | 50 | 43 | | 1 | 87 | 73-127 | 10/10/2023 2134 |
| Ethylbenzene | 50 | 47 | | 1 | 95 | 79-121 | 10/10/2023 2134 |
| 2-Hexanone | 100 | 96 | | 1 | 96 | 57-139 | 10/10/2023 2134 |
| Isopropylbenzene | 50 | 48 | | 1 | 96 | 72-131 | 10/10/2023 2134 |
| Methyl acetate | 50 | 46 | | 1 | 92 | 56-136 | 10/10/2023 2134 |
| Methyl tertiary butyl ether (MTBE) | 50 | 42 | | 1 | 84 | 71-124 | 10/10/2023 2134 |
| 4-Methyl-2-pentanone | 100 | 87 | | 1 | 87 | 67-130 | 10/10/2023 2134 |
| Methylcyclohexane | 50 | 43 | | 1 | 86 | 72-132 | 10/10/2023 2134 |
| Methylene chloride | 50 | 41 | | 1 | 81 | 74-124 | 10/10/2023 2134 |
| Naphthalene | 50 | 49 | | 1 | 99 | 61-128 | 10/10/2023 2134 |
| Styrene | 50 | 48 | | 1 | 97 | 78-123 | 10/10/2023 2134 |
| 1,1,2,2-Tetrachloroethane | 50 | 43 | | 1 | 86 | 71-121 | 10/10/2023 2134 |
| Tetrachloroethene | 50 | 48 | | 1 | 96 | 74-129 | 10/10/2023 2134 |
| Toluene | 50 | 47 | | 1 | 94 | 80-121 | 10/10/2023 2134 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 50 | 40 | | 1 | 81 | 70-136 | 10/10/2023 2134 |
| 1,2,4-Trichlorobenzene | 50 | 47 | | 1 | 93 | 69-130 | 10/10/2023 2134 |
| 1,1,1-Trichloroethane | 50 | 42 | | 1 | 84 | 74-131 | 10/10/2023 2134 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** YQ87040-002
**Batch:** 87040
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 50 | 46 | | 1 | 91 | 80-119 | 10/10/2023 2134 |
| Trichloroethene | 50 | 48 | | 1 | 95 | 79-123 | 10/10/2023 2134 |
| Trichlorofluoromethane | 50 | 47 | M-03 | 1 | 95 | 65-141 | 10/10/2023 2134 |
| Vinyl chloride | 50 | 43 | | 1 | 86 | 58-137 | 10/10/2023 2134 |
| Xylenes (total) | 100 | 95 | | 1 | 95 | 79-121 | 10/10/2023 2134 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 96 | 81-118 |
| Bromofluorobenzene | | 100 | 85-114 |
| Toluene-d8 | | 97 | 89-112 |
| Dibromofluoromethane | | 90 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** YQ87138-001
**Batch:** 87138
**Analytical Method:** 8260D
**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Acetone | 10 | U | 1 | 20 | 10 | 5.0 | ug/L | 10/11/2023 2105 |
| Benzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Bromodichloromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Bromoform | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Bromomethane (Methyl bromide) | 0.80 | U | 1 | 2.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 2-Butanone (MEK) | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/11/2023 2105 |
| Carbon disulfide | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Carbon tetrachloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Chlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Chloroethane | 0.80 | U | 1 | 2.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Chloroform | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Chloromethane (Methyl chloride) | 1.0 | U | 1 | 2.0 | 1.0 | 0.50 | ug/L | 10/11/2023 2105 |
| Cyclohexane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Dibromochloromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 1,2-Dibromoethane (EDB) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 1,2-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 1,3-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 1,4-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Dichlorodifluoromethane | 1.2 | U | 1 | 2.0 | 1.2 | 0.60 | ug/L | 10/11/2023 2105 |
| 1,1-Dichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 1,2-Dichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 1,1-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| cis-1,2-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| trans-1,2-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 1,2-Dichloropropane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| cis-1,3-Dichloropropene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| trans-1,3-Dichloropropene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Ethylbenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 2-Hexanone | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/11/2023 2105 |
| Isopropylbenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Methyl acetate | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Methyl tertiary butyl ether (MTBE) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 4-Methyl-2-pentanone | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/11/2023 2105 |
| Methylcyclohexane | 0.80 | U | 1 | 5.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Methylene chloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Naphthalene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Styrene | 0.82 | U | 1 | 1.0 | 0.82 | 0.41 | ug/L | 10/11/2023 2105 |
| 1,1,2,2-Tetrachloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Tetrachloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Toluene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.84 | U | 1 | 1.0 | 0.84 | 0.42 | ug/L | 10/11/2023 2105 |
| 1,2,4-Trichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| 1,1,1-Trichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** YQ87138-001
**Batch:** 87138
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Trichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Trichlorofluoromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Vinyl chloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |
| Xylenes (total) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 2105 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 117 | 81-118 |
| Bromofluorobenzene | | 101 | 85-114 |
| Toluene-d8 | | 104 | 89-112 |
| Dibromofluoromethane | | 104 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** YQ87138-002
**Batch:** 87138
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acetone | 100 | 74 | | 1 | 74 | 39-160 | 10/11/2023 1925 |
| Benzene | 50 | 51 | | 1 | 102 | 79-120 | 10/11/2023 1925 |
| Bromodichloromethane | 50 | 51 | | 1 | 101 | 79-125 | 10/11/2023 1925 |
| Bromoform | 50 | 38 | | 1 | 76 | 66-130 | 10/11/2023 1925 |
| Bromomethane (Methyl bromide) | 50 | 50 | | 1 | 101 | 53-141 | 10/11/2023 1925 |
| 2-Butanone (MEK) | 100 | 110 | | 1 | 113 | 56-143 | 10/11/2023 1925 |
| Carbon disulfide | 50 | 50 | | 1 | 101 | 64-133 | 10/11/2023 1925 |
| Carbon tetrachloride | 50 | 54 | | 1 | 107 | 72-136 | 10/11/2023 1925 |
| Chlorobenzene | 50 | 50 | | 1 | 100 | 82-118 | 10/11/2023 1925 |
| Chloroethane | 50 | 51 | | 1 | 102 | 60-138 | 10/11/2023 1925 |
| Chloroform | 50 | 52 | | 1 | 104 | 79-124 | 10/11/2023 1925 |
| Chloromethane (Methyl chloride) | 50 | 53 | | 1 | 105 | 50-139 | 10/11/2023 1925 |
| Cyclohexane | 50 | 53 | | 1 | 106 | 71-130 | 10/11/2023 1925 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 50 | 45 | | 1 | 89 | 62-128 | 10/11/2023 1925 |
| Dibromochloromethane | 50 | 50 | | 1 | 99 | 74-126 | 10/11/2023 1925 |
| 1,2-Dibromoethane (EDB) | 50 | 53 | | 1 | 106 | 77-121 | 10/11/2023 1925 |
| 1,2-Dichlorobenzene | 50 | 48 | | 1 | 95 | 80-119 | 10/11/2023 1925 |
| 1,3-Dichlorobenzene | 50 | 49 | | 1 | 97 | 80-119 | 10/11/2023 1925 |
| 1,4-Dichlorobenzene | 50 | 48 | | 1 | 96 | 79-118 | 10/11/2023 1925 |
| Dichlorodifluoromethane | 50 | 55 | | 1 | 109 | 32-152 | 10/11/2023 1925 |
| 1,1-Dichloroethane | 50 | 52 | | 1 | 103 | 77-125 | 10/11/2023 1925 |
| 1,2-Dichloroethane | 50 | 55 | | 1 | 110 | 73-128 | 10/11/2023 1925 |
| 1,1-Dichloroethene | 50 | 52 | | 1 | 104 | 71-131 | 10/11/2023 1925 |
| cis-1,2-Dichloroethene | 50 | 49 | | 1 | 98 | 78-123 | 10/11/2023 1925 |
| trans-1,2-Dichloroethene | 50 | 51 | | 1 | 101 | 75-124 | 10/11/2023 1925 |
| 1,2-Dichloropropane | 50 | 51 | | 1 | 102 | 78-122 | 10/11/2023 1925 |
| cis-1,3-Dichloropropene | 50 | 51 | | 1 | 102 | 75-124 | 10/11/2023 1925 |
| trans-1,3-Dichloropropene | 50 | 43 | | 1 | 87 | 73-127 | 10/11/2023 1925 |
| Ethylbenzene | 50 | 51 | | 1 | 101 | 79-121 | 10/11/2023 1925 |
| 2-Hexanone | 100 | 120 | | 1 | 123 | 57-139 | 10/11/2023 1925 |
| Isopropylbenzene | 50 | 51 | | 1 | 103 | 72-131 | 10/11/2023 1925 |
| Methyl acetate | 50 | 49 | | 1 | 99 | 56-136 | 10/11/2023 1925 |
| Methyl tertiary butyl ether (MTBE) | 50 | 48 | | 1 | 97 | 71-124 | 10/11/2023 1925 |
| 4-Methyl-2-pentanone | 100 | 110 | | 1 | 114 | 67-130 | 10/11/2023 1925 |
| Methylcyclohexane | 50 | 51 | | 1 | 101 | 72-132 | 10/11/2023 1925 |
| Methylene chloride | 50 | 48 | | 1 | 95 | 74-124 | 10/11/2023 1925 |
| Naphthalene | 50 | 41 | | 1 | 81 | 61-128 | 10/11/2023 1925 |
| Styrene | 50 | 51 | | 1 | 101 | 78-123 | 10/11/2023 1925 |
| 1,1,2,2-Tetrachloroethane | 50 | 52 | | 1 | 103 | 71-121 | 10/11/2023 1925 |
| Tetrachloroethene | 50 | 50 | | 1 | 99 | 74-129 | 10/11/2023 1925 |
| Toluene | 50 | 51 | | 1 | 102 | 80-121 | 10/11/2023 1925 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 50 | 53 | | 1 | 107 | 70-136 | 10/11/2023 1925 |
| 1,2,4-Trichlorobenzene | 50 | 39 | | 1 | 78 | 69-130 | 10/11/2023 1925 |
| 1,1,1-Trichloroethane | 50 | 55 | | 1 | 109 | 74-131 | 10/11/2023 1925 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** YQ87138-002
**Batch:** 87138
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 50 | 52 | | 1 | 104 | 80-119 | 10/11/2023 1925 |
| Trichloroethene | 50 | 49 | | 1 | 98 | 79-123 | 10/11/2023 1925 |
| Trichlorofluoromethane | 50 | 56 | | 1 | 112 | 65-141 | 10/11/2023 1925 |
| Vinyl chloride | 50 | 57 | | 1 | 115 | 58-137 | 10/11/2023 1925 |
| Xylenes (total) | 100 | 100 | | 1 | 102 | 79-121 | 10/11/2023 1925 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 99 | 81-118 |
| Bromofluorobenzene | | 96 | 85-114 |
| Toluene-d8 | | 94 | 89-112 |
| Dibromofluoromethane | | 92 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - LCSD

**Sample ID:** YQ87138-003
**Batch:** 87138
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 100 | 57 | + | 1 | 57 | 26 | 39-160 | 20 | 10/11/2023 1950 |
| Benzene | 50 | 52 | | 1 | 103 | 1.6 | 79-120 | 20 | 10/11/2023 1950 |
| Bromodichloromethane | 50 | 51 | | 1 | 103 | 1.2 | 79-125 | 20 | 10/11/2023 1950 |
| Bromoform | 50 | 40 | | 1 | 80 | 5.6 | 66-130 | 20 | 10/11/2023 1950 |
| Bromomethane (Methyl bromide) | 50 | 51 | | 1 | 101 | 0.50 | 53-141 | 20 | 10/11/2023 1950 |
| 2-Butanone (MEK) | 100 | 110 | | 1 | 107 | 5.4 | 56-143 | 20 | 10/11/2023 1950 |
| Carbon disulfide | 50 | 52 | | 1 | 104 | 3.4 | 64-133 | 20 | 10/11/2023 1950 |
| Carbon tetrachloride | 50 | 54 | | 1 | 107 | 0.28 | 72-136 | 20 | 10/11/2023 1950 |
| Chlorobenzene | 50 | 50 | | 1 | 101 | 0.78 | 82-118 | 20 | 10/11/2023 1950 |
| Chloroethane | 50 | 51 | | 1 | 101 | 0.082 | 60-138 | 20 | 10/11/2023 1950 |
| Chloroform | 50 | 51 | | 1 | 103 | 0.63 | 79-124 | 20 | 10/11/2023 1950 |
| Chloromethane (Methyl chloride) | 50 | 54 | | 1 | 108 | 2.9 | 50-139 | 20 | 10/11/2023 1950 |
| Cyclohexane | 50 | 53 | | 1 | 106 | 0.47 | 71-130 | 20 | 10/11/2023 1950 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 50 | 48 | | 1 | 96 | 7.6 | 62-128 | 20 | 10/11/2023 1950 |
| Dibromochloromethane | 50 | 52 | | 1 | 103 | 4.3 | 74-126 | 20 | 10/11/2023 1950 |
| 1,2-Dibromoethane (EDB) | 50 | 53 | | 1 | 107 | 0.94 | 77-121 | 20 | 10/11/2023 1950 |
| 1,2-Dichlorobenzene | 50 | 49 | | 1 | 97 | 2.0 | 80-119 | 20 | 10/11/2023 1950 |
| 1,3-Dichlorobenzene | 50 | 50 | | 1 | 100 | 3.2 | 80-119 | 20 | 10/11/2023 1950 |
| 1,4-Dichlorobenzene | 50 | 50 | | 1 | 99 | 3.1 | 79-118 | 20 | 10/11/2023 1950 |
| Dichlorodifluoromethane | 50 | 55 | | 1 | 111 | 1.4 | 32-152 | 20 | 10/11/2023 1950 |
| 1,1-Dichloroethane | 50 | 51 | | 1 | 102 | 1.1 | 77-125 | 20 | 10/11/2023 1950 |
| 1,2-Dichloroethane | 50 | 55 | | 1 | 110 | 0.090 | 73-128 | 20 | 10/11/2023 1950 |
| 1,1-Dichloroethene | 50 | 53 | | 1 | 106 | 1.5 | 71-131 | 20 | 10/11/2023 1950 |
| cis-1,2-Dichloroethene | 50 | 50 | | 1 | 99 | 1.1 | 78-123 | 20 | 10/11/2023 1950 |
| trans-1,2-Dichloroethene | 50 | 51 | | 1 | 102 | 0.90 | 75-124 | 20 | 10/11/2023 1950 |
| 1,2-Dichloropropane | 50 | 52 | | 1 | 103 | 1.1 | 78-122 | 20 | 10/11/2023 1950 |
| cis-1,3-Dichloropropene | 50 | 54 | | 1 | 108 | 5.6 | 75-124 | 20 | 10/11/2023 1950 |
| trans-1,3-Dichloropropene | 50 | 47 | | 1 | 93 | 7.5 | 73-127 | 20 | 10/11/2023 1950 |
| Ethylbenzene | 50 | 51 | | 1 | 103 | 1.6 | 79-121 | 20 | 10/11/2023 1950 |
| 2-Hexanone | 100 | 130 | | 1 | 126 | 2.5 | 57-139 | 20 | 10/11/2023 1950 |
| Isopropylbenzene | 50 | 50 | | 1 | 100 | 3.3 | 72-131 | 20 | 10/11/2023 1950 |
| Methyl acetate | 50 | 45 | | 1 | 91 | 8.6 | 56-136 | 20 | 10/11/2023 1950 |
| Methyl tertiary butyl ether (MTBE) | 50 | 48 | | 1 | 95 | 1.4 | 71-124 | 20 | 10/11/2023 1950 |
| 4-Methyl-2-pentanone | 100 | 110 | | 1 | 111 | 2.8 | 67-130 | 20 | 10/11/2023 1950 |
| Methylcyclohexane | 50 | 52 | | 1 | 104 | 2.9 | 72-132 | 20 | 10/11/2023 1950 |
| Methylene chloride | 50 | 46 | | 1 | 93 | 2.8 | 74-124 | 20 | 10/11/2023 1950 |
| Naphthalene | 50 | 44 | | 1 | 89 | 9.1 | 61-128 | 20 | 10/11/2023 1950 |
| Styrene | 50 | 51 | | 1 | 102 | 1.0 | 78-123 | 20 | 10/11/2023 1950 |
| 1,1,2,2-Tetrachloroethane | 50 | 54 | | 1 | 107 | 3.8 | 71-121 | 20 | 10/11/2023 1950 |
| Tetrachloroethene | 50 | 52 | | 1 | 103 | 3.8 | 74-129 | 20 | 10/11/2023 1950 |
| Toluene | 50 | 53 | | 1 | 105 | 3.4 | 80-121 | 20 | 10/11/2023 1950 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 50 | 55 | | 1 | 110 | 2.5 | 70-136 | 20 | 10/11/2023 1950 |
| 1,2,4-Trichlorobenzene | 50 | 39 | | 1 | 78 | 0.24 | 69-130 | 20 | 10/11/2023 1950 |
| 1,1,1-Trichloroethane | 50 | 55 | | 1 | 110 | 1.3 | 74-131 | 20 | 10/11/2023 1950 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCSD

**Sample ID:** YQ87138-003
**Batch:** 87138
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 50 | 54 | | 1 | 107 | 3.1 | 80-119 | 20 | 10/11/2023 1950 |
| Trichloroethene | 50 | 50 | | 1 | 100 | 2.2 | 79-123 | 20 | 10/11/2023 1950 |
| Trichlorofluoromethane | 50 | 56 | | 1 | 113 | 0.43 | 65-141 | 20 | 10/11/2023 1950 |
| Vinyl chloride | 50 | 58 | | 1 | 116 | 0.45 | 58-137 | 20 | 10/11/2023 1950 |
| Xylenes (total) | 100 | 100 | | 1 | 101 | 0.95 | 79-121 | 20 | 10/11/2023 1950 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 97 | 81-118 |
| Bromofluorobenzene | | 95 | 85-114 |
| Toluene-d8 | | 96 | 89-112 |
| Dibromofluoromethane | | 92 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** YQ87165-001
**Batch:** 87165
**Analytical Method:** 8260D
**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Acetone | 10 | U | 1 | 20 | 10 | 5.0 | ug/L | 10/11/2023 1143 |
| Benzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Bromodichloromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Bromoform | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Bromomethane (Methyl bromide) | 0.80 | U | 1 | 2.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 2-Butanone (MEK) | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/11/2023 1143 |
| Carbon disulfide | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Carbon tetrachloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Chlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Chloroethane | 0.80 | U | 1 | 2.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Chloroform | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Chloromethane (Methyl chloride) | 1.0 | U | 1 | 2.0 | 1.0 | 0.50 | ug/L | 10/11/2023 1143 |
| Cyclohexane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Dibromochloromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 1,2-Dibromoethane (EDB) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 1,2-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 1,3-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 1,4-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Dichlorodifluoromethane | 1.2 | U | 1 | 2.0 | 1.2 | 0.60 | ug/L | 10/11/2023 1143 |
| 1,1-Dichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 1,2-Dichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 1,1-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| cis-1,2-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| trans-1,2-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 1,2-Dichloropropane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| cis-1,3-Dichloropropene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| trans-1,3-Dichloropropene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Ethylbenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 2-Hexanone | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/11/2023 1143 |
| Isopropylbenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Methyl acetate | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Methyl tertiary butyl ether (MTBE) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 4-Methyl-2-pentanone | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/11/2023 1143 |
| Methylcyclohexane | 0.80 | U | 1 | 5.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Methylene chloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Naphthalene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Styrene | 0.82 | U | 1 | 1.0 | 0.82 | 0.41 | ug/L | 10/11/2023 1143 |
| 1,1,2,2-Tetrachloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Tetrachloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Toluene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.84 | U | 1 | 1.0 | 0.84 | 0.42 | ug/L | 10/11/2023 1143 |
| 1,2,4-Trichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| 1,1,1-Trichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** YQ87165-001
**Batch:** 87165
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Trichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Trichlorofluoromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Vinyl chloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |
| Xylenes (total) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/11/2023 1143 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 112 | 81-118 |
| Bromofluorobenzene | | 94 | 85-114 |
| Toluene-d8 | | 101 | 89-112 |
| Dibromofluoromethane | | 112 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** YQ87165-002
**Batch:** 87165
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acetone | 100 | 110 | M-03 | 1 | 113 | 39-160 | 10/11/2023 1033 |
| Benzene | 50 | 46 | | 1 | 91 | 79-120 | 10/11/2023 1033 |
| Bromodichloromethane | 50 | 47 | | 1 | 94 | 79-125 | 10/11/2023 1033 |
| Bromoform | 50 | 48 | | 1 | 97 | 66-130 | 10/11/2023 1033 |
| Bromomethane (Methyl bromide) | 50 | 46 | | 1 | 92 | 53-141 | 10/11/2023 1033 |
| 2-Butanone (MEK) | 100 | 95 | | 1 | 95 | 56-143 | 10/11/2023 1033 |
| Carbon disulfide | 50 | 45 | | 1 | 89 | 64-133 | 10/11/2023 1033 |
| Carbon tetrachloride | 50 | 46 | | 1 | 92 | 72-136 | 10/11/2023 1033 |
| Chlorobenzene | 50 | 46 | | 1 | 93 | 82-118 | 10/11/2023 1033 |
| Chloroethane | 50 | 43 | | 1 | 85 | 60-138 | 10/11/2023 1033 |
| Chloroform | 50 | 43 | | 1 | 85 | 79-124 | 10/11/2023 1033 |
| Chloromethane (Methyl chloride) | 50 | 43 | | 1 | 87 | 50-139 | 10/11/2023 1033 |
| Cyclohexane | 50 | 42 | | 1 | 85 | 71-130 | 10/11/2023 1033 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 50 | 49 | | 1 | 98 | 62-128 | 10/11/2023 1033 |
| Dibromochloromethane | 50 | 50 | | 1 | 101 | 74-126 | 10/11/2023 1033 |
| 1,2-Dibromoethane (EDB) | 50 | 50 | | 1 | 101 | 77-121 | 10/11/2023 1033 |
| 1,2-Dichlorobenzene | 50 | 47 | | 1 | 94 | 80-119 | 10/11/2023 1033 |
| 1,3-Dichlorobenzene | 50 | 47 | | 1 | 95 | 80-119 | 10/11/2023 1033 |
| 1,4-Dichlorobenzene | 50 | 45 | | 1 | 91 | 79-118 | 10/11/2023 1033 |
| Dichlorodifluoromethane | 50 | 45 | M-03 | 1 | 89 | 32-152 | 10/11/2023 1033 |
| 1,1-Dichloroethane | 50 | 42 | | 1 | 85 | 77-125 | 10/11/2023 1033 |
| 1,2-Dichloroethane | 50 | 46 | | 1 | 93 | 73-128 | 10/11/2023 1033 |
| 1,1-Dichloroethene | 50 | 44 | | 1 | 89 | 71-131 | 10/11/2023 1033 |
| cis-1,2-Dichloroethene | 50 | 43 | | 1 | 85 | 78-123 | 10/11/2023 1033 |
| trans-1,2-Dichloroethene | 50 | 44 | | 1 | 88 | 75-124 | 10/11/2023 1033 |
| 1,2-Dichloropropane | 50 | 45 | | 1 | 91 | 78-122 | 10/11/2023 1033 |
| cis-1,3-Dichloropropene | 50 | 49 | | 1 | 98 | 75-124 | 10/11/2023 1033 |
| trans-1,3-Dichloropropene | 50 | 50 | | 1 | 100 | 73-127 | 10/11/2023 1033 |
| Ethylbenzene | 50 | 48 | | 1 | 96 | 79-121 | 10/11/2023 1033 |
| 2-Hexanone | 100 | 100 | | 1 | 100 | 57-139 | 10/11/2023 1033 |
| Isopropylbenzene | 50 | 50 | | 1 | 100 | 72-131 | 10/11/2023 1033 |
| Methyl acetate | 50 | 47 | M-03 | 1 | 94 | 56-136 | 10/11/2023 1033 |
| Methyl tertiary butyl ether (MTBE) | 50 | 46 | | 1 | 92 | 71-124 | 10/11/2023 1033 |
| 4-Methyl-2-pentanone | 100 | 96 | | 1 | 96 | 67-130 | 10/11/2023 1033 |
| Methylcyclohexane | 50 | 46 | | 1 | 92 | 72-132 | 10/11/2023 1033 |
| Methylene chloride | 50 | 45 | | 1 | 89 | 74-124 | 10/11/2023 1033 |
| Naphthalene | 50 | 52 | | 1 | 103 | 61-128 | 10/11/2023 1033 |
| Styrene | 50 | 49 | | 1 | 98 | 78-123 | 10/11/2023 1033 |
| 1,1,2,2-Tetrachloroethane | 50 | 46 | | 1 | 91 | 71-121 | 10/11/2023 1033 |
| Tetrachloroethene | 50 | 49 | | 1 | 98 | 74-129 | 10/11/2023 1033 |
| Toluene | 50 | 48 | | 1 | 96 | 80-121 | 10/11/2023 1033 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 50 | 45 | | 1 | 90 | 70-136 | 10/11/2023 1033 |
| 1,2,4-Trichlorobenzene | 50 | 48 | | 1 | 96 | 69-130 | 10/11/2023 1033 |
| 1,1,1-Trichloroethane | 50 | 45 | | 1 | 91 | 74-131 | 10/11/2023 1033 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** YQ87165-002
**Batch:** 87165
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 50 | 47 | | 1 | 94 | 80-119 | 10/11/2023 1033 |
| Trichloroethene | 50 | 46 | | 1 | 92 | 79-123 | 10/11/2023 1033 |
| Trichlorofluoromethane | 50 | 49 | M-03 | 1 | 99 | 65-141 | 10/11/2023 1033 |
| Vinyl chloride | 50 | 44 | | 1 | 89 | 58-137 | 10/11/2023 1033 |
| Xylenes (total) | 100 | 98 | | 1 | 98 | 79-121 | 10/11/2023 1033 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 97 | 81-118 |
| Bromofluorobenzene | | 102 | 85-114 |
| Toluene-d8 | | 99 | 89-112 |
| Dibromofluoromethane | | 95 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** YQ87294-001
**Batch:** 87294
**Analytical Method:** 8260D
**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Acetone | 10 | U | 1 | 20 | 10 | 5.0 | ug/L | 10/12/2023 2207 |
| Benzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Bromodichloromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Bromoform | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Bromomethane (Methyl bromide) | 0.80 | U | 1 | 2.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 2-Butanone (MEK) | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/12/2023 2207 |
| Carbon disulfide | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Carbon tetrachloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Chlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Chloroethane | 0.80 | U | 1 | 2.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Chloroform | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Chloromethane (Methyl chloride) | 1.0 | U | 1 | 2.0 | 1.0 | 0.50 | ug/L | 10/12/2023 2207 |
| Cyclohexane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Dibromochloromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 1,2-Dibromoethane (EDB) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 1,2-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 1,3-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 1,4-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Dichlorodifluoromethane | 1.2 | U | 1 | 2.0 | 1.2 | 0.60 | ug/L | 10/12/2023 2207 |
| 1,1-Dichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 1,2-Dichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 1,1-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| cis-1,2-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| trans-1,2-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 1,2-Dichloropropane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| cis-1,3-Dichloropropene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| trans-1,3-Dichloropropene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Ethylbenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 2-Hexanone | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/12/2023 2207 |
| Isopropylbenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Methyl acetate | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Methyl tertiary butyl ether (MTBE) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 4-Methyl-2-pentanone | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/12/2023 2207 |
| Methylcyclohexane | 0.80 | U | 1 | 5.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Methylene chloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Naphthalene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Styrene | 0.82 | U | 1 | 1.0 | 0.82 | 0.41 | ug/L | 10/12/2023 2207 |
| 1,1,2,2-Tetrachloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Tetrachloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Toluene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.84 | U | 1 | 1.0 | 0.84 | 0.42 | ug/L | 10/12/2023 2207 |
| 1,2,4-Trichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| 1,1,1-Trichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** YQ87294-001
**Batch:** 87294
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Trichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Trichlorofluoromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Vinyl chloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |
| Xylenes (total) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/12/2023 2207 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 107 | 81-118 |
| Bromofluorobenzene | | 92 | 85-114 |
| Toluene-d8 | | 111 | 89-112 |
| Dibromofluoromethane | | 109 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** YQ87294-002
**Batch:** 87294
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acetone | 100 | 110 | | 1 | 105 | 39-160 | 10/12/2023 2052 |
| Benzene | 50 | 50 | | 1 | 100 | 79-120 | 10/12/2023 2052 |
| Bromodichloromethane | 50 | 55 | | 1 | 110 | 79-125 | 10/12/2023 2052 |
| Bromoform | 50 | 52 | | 1 | 104 | 66-130 | 10/12/2023 2052 |
| Bromomethane (Methyl bromide) | 50 | 57 | | 1 | 113 | 53-141 | 10/12/2023 2052 |
| 2-Butanone (MEK) | 100 | 98 | | 1 | 98 | 56-143 | 10/12/2023 2052 |
| Carbon disulfide | 50 | 51 | | 1 | 101 | 64-133 | 10/12/2023 2052 |
| Carbon tetrachloride | 50 | 50 | | 1 | 99 | 72-136 | 10/12/2023 2052 |
| Chlorobenzene | 50 | 51 | | 1 | 102 | 82-118 | 10/12/2023 2052 |
| Chloroethane | 50 | 50 | | 1 | 100 | 60-138 | 10/12/2023 2052 |
| Chloroform | 50 | 47 | | 1 | 93 | 79-124 | 10/12/2023 2052 |
| Chloromethane (Methyl chloride) | 50 | 49 | | 1 | 98 | 50-139 | 10/12/2023 2052 |
| Cyclohexane | 50 | 45 | | 1 | 90 | 71-130 | 10/12/2023 2052 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 50 | 48 | | 1 | 96 | 62-128 | 10/12/2023 2052 |
| Dibromochloromethane | 50 | 54 | | 1 | 107 | 74-126 | 10/12/2023 2052 |
| 1,2-Dibromoethane (EDB) | 50 | 56 | | 1 | 111 | 77-121 | 10/12/2023 2052 |
| 1,2-Dichlorobenzene | 50 | 51 | | 1 | 101 | 80-119 | 10/12/2023 2052 |
| 1,3-Dichlorobenzene | 50 | 51 | | 1 | 102 | 80-119 | 10/12/2023 2052 |
| 1,4-Dichlorobenzene | 50 | 50 | | 1 | 100 | 79-118 | 10/12/2023 2052 |
| Dichlorodifluoromethane | 50 | 46 | | 1 | 92 | 32-152 | 10/12/2023 2052 |
| 1,1-Dichloroethane | 50 | 45 | | 1 | 89 | 77-125 | 10/12/2023 2052 |
| 1,2-Dichloroethane | 50 | 51 | | 1 | 102 | 73-128 | 10/12/2023 2052 |
| 1,1-Dichloroethene | 50 | 53 | | 1 | 106 | 71-131 | 10/12/2023 2052 |
| cis-1,2-Dichloroethene | 50 | 46 | | 1 | 93 | 78-123 | 10/12/2023 2052 |
| trans-1,2-Dichloroethene | 50 | 51 | | 1 | 103 | 75-124 | 10/12/2023 2052 |
| 1,2-Dichloropropane | 50 | 49 | | 1 | 98 | 78-122 | 10/12/2023 2052 |
| cis-1,3-Dichloropropene | 50 | 60 | | 1 | 121 | 75-124 | 10/12/2023 2052 |
| trans-1,3-Dichloropropene | 50 | 57 | | 1 | 113 | 73-127 | 10/12/2023 2052 |
| Ethylbenzene | 50 | 54 | | 1 | 108 | 79-121 | 10/12/2023 2052 |
| 2-Hexanone | 100 | 100 | | 1 | 104 | 57-139 | 10/12/2023 2052 |
| Isopropylbenzene | 50 | 56 | | 1 | 112 | 72-131 | 10/12/2023 2052 |
| Methyl acetate | 50 | 52 | | 1 | 105 | 56-136 | 10/12/2023 2052 |
| Methyl tertiary butyl ether (MTBE) | 50 | 52 | | 1 | 105 | 71-124 | 10/12/2023 2052 |
| 4-Methyl-2-pentanone | 100 | 120 | | 1 | 118 | 67-130 | 10/12/2023 2052 |
| Methylcyclohexane | 50 | 51 | | 1 | 101 | 72-132 | 10/12/2023 2052 |
| Methylene chloride | 50 | 50 | | 1 | 100 | 74-124 | 10/12/2023 2052 |
| Naphthalene | 50 | 53 | | 1 | 106 | 61-128 | 10/12/2023 2052 |
| Styrene | 50 | 55 | | 1 | 111 | 78-123 | 10/12/2023 2052 |
| 1,1,2,2-Tetrachloroethane | 50 | 49 | | 1 | 98 | 71-121 | 10/12/2023 2052 |
| Tetrachloroethene | 50 | 56 | | 1 | 113 | 74-129 | 10/12/2023 2052 |
| Toluene | 50 | 60 | | 1 | 120 | 80-121 | 10/12/2023 2052 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 50 | 53 | | 1 | 107 | 70-136 | 10/12/2023 2052 |
| 1,2,4-Trichlorobenzene | 50 | 48 | | 1 | 95 | 69-130 | 10/12/2023 2052 |
| 1,1,1-Trichloroethane | 50 | 49 | | 1 | 98 | 74-131 | 10/12/2023 2052 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** YQ87294-002
**Batch:** 87294
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 50 | 56 | | 1 | 112 | 80-119 | 10/12/2023 2052 |
| Trichloroethene | 50 | 50 | | 1 | 101 | 79-123 | 10/12/2023 2052 |
| Trichlorofluoromethane | 50 | 55 | | 1 | 111 | 65-141 | 10/12/2023 2052 |
| Vinyl chloride | 50 | 52 | | 1 | 103 | 58-137 | 10/12/2023 2052 |
| Xylenes (total) | 100 | 110 | | 1 | 107 | 79-121 | 10/12/2023 2052 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 93 | 81-118 |
| Bromofluorobenzene | | 98 | 85-114 |
| Toluene-d8 | | 110 | 89-112 |
| Dibromofluoromethane | | 92 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCSD

**Sample ID:** YQ87294-003
**Batch:** 87294
**Analytical Method:** 8260D
**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| Acetone | 100 | 98 | | 1 | 98 | 7.5 | 39-160 | 20 | 10/12/2023 2117 |
| Benzene | 50 | 49 | | 1 | 98 | 2.3 | 79-120 | 20 | 10/12/2023 2117 |
| Bromodichloromethane | 50 | 52 | | 1 | 103 | 6.5 | 79-125 | 20 | 10/12/2023 2117 |
| Bromoform | 50 | 54 | | 1 | 107 | 3.2 | 66-130 | 20 | 10/12/2023 2117 |
| Bromomethane (Methyl bromide) | 50 | 51 | | 1 | 103 | 9.6 | 53-141 | 20 | 10/12/2023 2117 |
| 2-Butanone (MEK) | 100 | 99 | | 1 | 99 | 1.4 | 56-143 | 20 | 10/12/2023 2117 |
| Carbon disulfide | 50 | 47 | | 1 | 93 | 8.2 | 64-133 | 20 | 10/12/2023 2117 |
| Carbon tetrachloride | 50 | 50 | | 1 | 99 | 0.051 | 72-136 | 20 | 10/12/2023 2117 |
| Chlorobenzene | 50 | 51 | | 1 | 103 | 0.54 | 82-118 | 20 | 10/12/2023 2117 |
| Chloroethane | 50 | 44 | | 1 | 89 | 12 | 60-138 | 20 | 10/12/2023 2117 |
| Chloroform | 50 | 47 | | 1 | 93 | 0.14 | 79-124 | 20 | 10/12/2023 2117 |
| Chloromethane (Methyl chloride) | 50 | 48 | | 1 | 95 | 3.1 | 50-139 | 20 | 10/12/2023 2117 |
| Cyclohexane | 50 | 45 | | 1 | 89 | 1.3 | 71-130 | 20 | 10/12/2023 2117 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 50 | 50 | | 1 | 101 | 5.1 | 62-128 | 20 | 10/12/2023 2117 |
| Dibromochloromethane | 50 | 55 | | 1 | 110 | 2.2 | 74-126 | 20 | 10/12/2023 2117 |
| 1,2-Dibromoethane (EDB) | 50 | 55 | | 1 | 111 | 0.49 | 77-121 | 20 | 10/12/2023 2117 |
| 1,2-Dichlorobenzene | 50 | 51 | | 1 | 102 | 0.45 | 80-119 | 20 | 10/12/2023 2117 |
| 1,3-Dichlorobenzene | 50 | 52 | | 1 | 104 | 2.2 | 80-119 | 20 | 10/12/2023 2117 |
| 1,4-Dichlorobenzene | 50 | 50 | | 1 | 101 | 1.2 | 79-118 | 20 | 10/12/2023 2117 |
| Dichlorodifluoromethane | 50 | 47 | | 1 | 93 | 1.3 | 32-152 | 20 | 10/12/2023 2117 |
| 1,1-Dichloroethane | 50 | 41 | | 1 | 82 | 8.6 | 77-125 | 20 | 10/12/2023 2117 |
| 1,2-Dichloroethane | 50 | 49 | | 1 | 98 | 3.7 | 73-128 | 20 | 10/12/2023 2117 |
| 1,1-Dichloroethene | 50 | 48 | | 1 | 95 | 11 | 71-131 | 20 | 10/12/2023 2117 |
| cis-1,2-Dichloroethene | 50 | 47 | | 1 | 94 | 0.90 | 78-123 | 20 | 10/12/2023 2117 |
| trans-1,2-Dichloroethene | 50 | 44 | | 1 | 88 | 16 | 75-124 | 20 | 10/12/2023 2117 |
| 1,2-Dichloropropane | 50 | 48 | | 1 | 96 | 2.6 | 78-122 | 20 | 10/12/2023 2117 |
| cis-1,3-Dichloropropene | 50 | 52 | | 1 | 105 | 14 | 75-124 | 20 | 10/12/2023 2117 |
| trans-1,3-Dichloropropene | 50 | 53 | | 1 | 107 | 6.1 | 73-127 | 20 | 10/12/2023 2117 |
| Ethylbenzene | 50 | 54 | | 1 | 108 | 0.44 | 79-121 | 20 | 10/12/2023 2117 |
| 2-Hexanone | 100 | 110 | | 1 | 107 | 2.7 | 57-139 | 20 | 10/12/2023 2117 |
| Isopropylbenzene | 50 | 56 | | 1 | 112 | 0.060 | 72-131 | 20 | 10/12/2023 2117 |
| Methyl acetate | 50 | 48 | | 1 | 96 | 8.8 | 56-136 | 20 | 10/12/2023 2117 |
| Methyl tertiary butyl ether (MTBE) | 50 | 45 | | 1 | 90 | 16 | 71-124 | 20 | 10/12/2023 2117 |
| 4-Methyl-2-pentanone | 100 | 100 | | 1 | 101 | 16 | 67-130 | 20 | 10/12/2023 2117 |
| Methylcyclohexane | 50 | 49 | | 1 | 97 | 4.2 | 72-132 | 20 | 10/12/2023 2117 |
| Methylene chloride | 50 | 43 | | 1 | 86 | 15 | 74-124 | 20 | 10/12/2023 2117 |
| Naphthalene | 50 | 62 | | 1 | 123 | 15 | 61-128 | 20 | 10/12/2023 2117 |
| Styrene | 50 | 55 | | 1 | 111 | 0.095 | 78-123 | 20 | 10/12/2023 2117 |
| 1,1,2,2-Tetrachloroethane | 50 | 49 | | 1 | 98 | 0.76 | 71-121 | 20 | 10/12/2023 2117 |
| Tetrachloroethene | 50 | 53 | | 1 | 107 | 5.4 | 74-129 | 20 | 10/12/2023 2117 |
| Toluene | 50 | 57 | | 1 | 113 | 5.6 | 80-121 | 20 | 10/12/2023 2117 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 50 | 48 | | 1 | 95 | 11 | 70-136 | 20 | 10/12/2023 2117 |
| 1,2,4-Trichlorobenzene | 50 | 51 | | 1 | 101 | 6.4 | 69-130 | 20 | 10/12/2023 2117 |
| 1,1,1-Trichloroethane | 50 | 49 | | 1 | 97 | 0.89 | 74-131 | 20 | 10/12/2023 2117 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCSD

**Sample ID:** YQ87294-003
**Batch:** 87294
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 50 | 51 | | 1 | 103 | 8.7 | 80-119 | 20 | 10/12/2023 2117 |
| Trichloroethene | 50 | 51 | | 1 | 102 | 1.0 | 79-123 | 20 | 10/12/2023 2117 |
| Trichlorofluoromethane | 50 | 49 | M-03 | 1 | 98 | 12 | 65-141 | 20 | 10/12/2023 2117 |
| Vinyl chloride | 50 | 49 | | 1 | 97 | 5.9 | 58-137 | 20 | 10/12/2023 2117 |
| Xylenes (total) | 100 | 110 | | 1 | 109 | 0.95 | 79-121 | 20 | 10/12/2023 2117 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 95 | 81-118 |
| Bromofluorobenzene | | 102 | 85-114 |
| Toluene-d8 | | 110 | 89-112 |
| Dibromofluoromethane | | 97 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** YQ88182-001
**Batch:** 88182
**Analytical Method:** 8260D
**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Acetone | 10 | U | 1 | 20 | 10 | 5.0 | ug/L | 10/23/2023 1204 |
| Benzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Bromodichloromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Bromoform | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Bromomethane (Methyl bromide) | 0.80 | U | 1 | 2.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 2-Butanone (MEK) | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/23/2023 1204 |
| Carbon disulfide | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Carbon tetrachloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Chlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Chloroethane | 0.80 | U | 1 | 2.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Chloroform | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Chloromethane (Methyl chloride) | 1.0 | U | 1 | 2.0 | 1.0 | 0.50 | ug/L | 10/23/2023 1204 |
| Cyclohexane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Dibromochloromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 1,2-Dibromoethane (EDB) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 1,2-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 1,3-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 1,4-Dichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Dichlorodifluoromethane | 1.2 | U | 1 | 2.0 | 1.2 | 0.60 | ug/L | 10/23/2023 1204 |
| 1,1-Dichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 1,2-Dichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 1,1-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| cis-1,2-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| trans-1,2-Dichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 1,2-Dichloropropane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| cis-1,3-Dichloropropene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| trans-1,3-Dichloropropene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Ethylbenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 2-Hexanone | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/23/2023 1204 |
| Isopropylbenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Methyl acetate | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Methyl tertiary butyl ether (MTBE) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 4-Methyl-2-pentanone | 4.0 | U | 1 | 10 | 4.0 | 2.0 | ug/L | 10/23/2023 1204 |
| Methylcyclohexane | 0.80 | U | 1 | 5.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Methylene chloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Naphthalene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Styrene | 0.82 | U | 1 | 1.0 | 0.82 | 0.41 | ug/L | 10/23/2023 1204 |
| 1,1,2,2-Tetrachloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Tetrachloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Toluene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.84 | U | 1 | 1.0 | 0.84 | 0.42 | ug/L | 10/23/2023 1204 |
| 1,2,4-Trichlorobenzene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| 1,1,1-Trichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Volatile Organic Compounds by GC/MS - MB

**Sample ID:** YQ88182-001
**Batch:** 88182
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Trichloroethene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Trichlorofluoromethane | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Vinyl chloride | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |
| Xylenes (total) | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 10/23/2023 1204 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | N | 124 | 81-118 |
| Bromofluorobenzene | | 98 | 85-114 |
| Toluene-d8 | | 109 | 89-112 |
| Dibromofluoromethane | | 116 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** YQ88182-002
**Batch:** 88182
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Acetone | 100 | 110 | | 1 | 106 | 39-160 | 10/23/2023 0901 |
| Benzene | 50 | 54 | | 1 | 107 | 79-120 | 10/23/2023 0901 |
| Bromodichloromethane | 50 | 57 | | 1 | 114 | 79-125 | 10/23/2023 0901 |
| Bromoform | 50 | 46 | | 1 | 91 | 66-130 | 10/23/2023 0901 |
| Bromomethane (Methyl bromide) | 50 | 53 | | 1 | 107 | 53-141 | 10/23/2023 0901 |
| 2-Butanone (MEK) | 100 | 130 | | 1 | 127 | 56-143 | 10/23/2023 0901 |
| Carbon disulfide | 50 | 63 | | 1 | 126 | 64-133 | 10/23/2023 0901 |
| Carbon tetrachloride | 50 | 59 | | 1 | 118 | 72-136 | 10/23/2023 0901 |
| Chlorobenzene | 50 | 51 | | 1 | 102 | 82-118 | 10/23/2023 0901 |
| Chloroethane | 50 | 54 | | 1 | 107 | 60-138 | 10/23/2023 0901 |
| Chloroform | 50 | 57 | | 1 | 113 | 79-124 | 10/23/2023 0901 |
| Chloromethane (Methyl chloride) | 50 | 59 | | 1 | 119 | 50-139 | 10/23/2023 0901 |
| Cyclohexane | 50 | 58 | | 1 | 117 | 71-130 | 10/23/2023 0901 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 50 | 50 | | 1 | 101 | 62-128 | 10/23/2023 0901 |
| Dibromochloromethane | 50 | 57 | | 1 | 114 | 74-126 | 10/23/2023 0901 |
| 1,2-Dibromoethane (EDB) | 50 | 55 | | 1 | 110 | 77-121 | 10/23/2023 0901 |
| 1,2-Dichlorobenzene | 50 | 47 | | 1 | 95 | 80-119 | 10/23/2023 0901 |
| 1,3-Dichlorobenzene | 50 | 49 | | 1 | 98 | 80-119 | 10/23/2023 0901 |
| 1,4-Dichlorobenzene | 50 | 49 | | 1 | 98 | 79-118 | 10/23/2023 0901 |
| Dichlorodifluoromethane | 50 | 62 | | 1 | 124 | 32-152 | 10/23/2023 0901 |
| 1,1-Dichloroethane | 50 | 55 | | 1 | 110 | 77-125 | 10/23/2023 0901 |
| 1,2-Dichloroethane | 50 | 61 | | 1 | 122 | 73-128 | 10/23/2023 0901 |
| 1,1-Dichloroethene | 50 | 63 | | 1 | 126 | 71-131 | 10/23/2023 0901 |
| cis-1,2-Dichloroethene | 50 | 52 | | 1 | 104 | 78-123 | 10/23/2023 0901 |
| trans-1,2-Dichloroethene | 50 | 55 | | 1 | 109 | 75-124 | 10/23/2023 0901 |
| 1,2-Dichloropropane | 50 | 56 | | 1 | 111 | 78-122 | 10/23/2023 0901 |
| cis-1,3-Dichloropropene | 50 | 58 | | 1 | 117 | 75-124 | 10/23/2023 0901 |
| trans-1,3-Dichloropropene | 50 | 53 | | 1 | 106 | 73-127 | 10/23/2023 0901 |
| Ethylbenzene | 50 | 53 | | 1 | 107 | 79-121 | 10/23/2023 0901 |
| 2-Hexanone | 100 | 120 | | 1 | 124 | 57-139 | 10/23/2023 0901 |
| Isopropylbenzene | 50 | 55 | | 1 | 110 | 72-131 | 10/23/2023 0901 |
| Methyl acetate | 50 | 57 | | 1 | 115 | 56-136 | 10/23/2023 0901 |
| Methyl tertiary butyl ether (MTBE) | 50 | 54 | | 1 | 108 | 71-124 | 10/23/2023 0901 |
| 4-Methyl-2-pentanone | 100 | 120 | | 1 | 116 | 67-130 | 10/23/2023 0901 |
| Methylcyclohexane | 50 | 56 | | 1 | 112 | 72-132 | 10/23/2023 0901 |
| Methylene chloride | 50 | 53 | | 1 | 107 | 74-124 | 10/23/2023 0901 |
| Naphthalene | 50 | 38 | | 1 | 75 | 61-128 | 10/23/2023 0901 |
| Styrene | 50 | 56 | | 1 | 112 | 78-123 | 10/23/2023 0901 |
| 1,1,2,2-Tetrachloroethane | 50 | 53 | | 1 | 106 | 71-121 | 10/23/2023 0901 |
| Tetrachloroethene | 50 | 52 | | 1 | 104 | 74-129 | 10/23/2023 0901 |
| Toluene | 50 | 54 | | 1 | 108 | 80-121 | 10/23/2023 0901 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 50 | 55 | | 1 | 110 | 70-136 | 10/23/2023 0901 |
| 1,2,4-Trichlorobenzene | 50 | 38 | | 1 | 76 | 69-130 | 10/23/2023 0901 |
| 1,1,1-Trichloroethane | 50 | 60 | | 1 | 121 | 74-131 | 10/23/2023 0901 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Volatile Organic Compounds by GC/MS - LCS

**Sample ID:** YQ88182-002
**Batch:** 88182
**Analytical Method:** 8260D

**Matrix:** Aqueous
**Prep Method:** 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 50 | 54 | | 1 | 108 | 80-119 | 10/23/2023 0901 |
| Trichloroethene | 50 | 53 | | 1 | 106 | 79-123 | 10/23/2023 0901 |
| Trichlorofluoromethane | 50 | 62 | | 1 | 125 | 65-141 | 10/23/2023 0901 |
| Vinyl chloride | 50 | 62 | | 1 | 124 | 58-137 | 10/23/2023 0901 |
| Xylenes (total) | 100 | 110 | | 1 | 106 | 79-121 | 10/23/2023 0901 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | | 113 | 81-118 |
| Bromofluorobenzene | | 104 | 85-114 |
| Toluene-d8 | | 104 | 89-112 |
| Dibromofluoromethane | | 104 | 80-119 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Semivolatile Organic Compounds by GC/MS (SIM) - MB

**Sample ID:** YQ86383-001
**Batch:** 86383
**Analytical Method:** 8270E (SIM)

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/03/2023 1330

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 0.10 | U | 1 | 1.0 | 0.10 | 0.028 | ug/L | 10/12/2023 1103 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 99 | 23-154 |
| 2-Methylnaphthalene-d10 | | 83 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Semivolatile Organic Compounds by GC/MS (SIM) - LCS

**Sample ID:** YQ86383-002
**Batch:** 86383
**Analytical Method:** 8270E (SIM)

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/03/2023 1330

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Pentachlorophenol | 2.0 | 2.7 | | 1 | 134 | 36-141 | 10/12/2023 1128 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 85 | 23-154 |
| 2-Methylnaphthalene-d10 | | 80 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Semivolatile Organic Compounds by GC/MS (SIM) - MS

**Sample ID:** YI30001-001MS
**Batch:** 86383
**Analytical Method:** 8270E (SIM)

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/03/2023 1330

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | ND | 4.0 | 7.7 | N | 1 | 192 | 36-141 | 10/12/2023 1958 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 92 | 23-154 |
| 2-Methylnaphthalene-d10 | | 87 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Semivolatile Organic Compounds by GC/MS (SIM) - MSD

**Sample ID:** YI30001-001MD
**Batch:** 86383
**Analytical Method:** 8270E (SIM)

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/03/2023 1330

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | ND | 4.0 | 7.4 | N | 1 | 186 | 3.6 | 36-141 | 20 | 10/12/2023 2022 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 90 | 23-154 |
| 2-Methylnaphthalene-d10 | | 78 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Semivolatile Organic Compounds by GC/MS (SIM) - MB

**Sample ID:** YQ86606-001
**Batch:** 86606
**Analytical Method:** 8270E (SIM)

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/05/2023 1134

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | 0.060 | U | 1 | 0.20 | 0.060 | 0.030 | ug/L | 10/13/2023 1201 |
| Pentachlorophenol | 0.10 | U | 1 | 1.0 | 0.10 | 0.028 | ug/L | 10/13/2023 1201 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 101 | 23-154 |
| 2-Methylnaphthalene-d10 | | 83 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Semivolatile Organic Compounds by GC/MS (SIM) - LCS

**Sample ID:** YQ86606-002
**Batch:** 86606
**Analytical Method:** 8270E (SIM)

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/05/2023 1134

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Naphthalene | 0.60 | 0.49 | | 1 | 81 | 43-114 | 10/13/2023 1225 |
| Pentachlorophenol | 2.0 | 2.7 | | 1 | 136 | 36-141 | 10/13/2023 1225 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 93 | 23-154 |
| 2-Methylnaphthalene-d10 | | 80 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Semivolatile Organic Compounds by GC/MS (SIM) - MS

**Sample ID:** YI30001-010MS
**Batch:** 86606
**Analytical Method:** 8270E (SIM)

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/05/2023 1134

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | ND | 2.0 | 4.2 | N | 1 | 216 | 36-141 | 10/13/2023 1539 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 102 | 23-154 |
| 2-Methylnaphthalene-d10 | | 82 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Semivolatile Organic Compounds by GC/MS (SIM) - MSD

**Sample ID:** YI30001-010MD
**Batch:** 86606
**Analytical Method:** 8270E (SIM)

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/05/2023 1134

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | ND | 2.0 | 3.8 | N | 1 | 194 | 11 | 36-141 | 20 | 10/13/2023 1603 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 94 | 23-154 |
| 2-Methylnaphthalene-d10 | | 75 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Semivolatile Organic Compounds by GC/MS (SIM) - MS

**Sample ID:** YI30001-011MS
**Batch:** 86606
**Analytical Method:** 8270E (SIM)

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/05/2023 1134

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | ND | 1.9 | 3.8 | N | 1 | 193 | 36-141 | 10/13/2023 1652 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 93 | 23-154 |
| 2-Methylnaphthalene-d10 | | 72 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Semivolatile Organic Compounds by GC/MS (SIM) - MSD

**Sample ID:** YI30001-011MD
**Batch:** 86606
**Analytical Method:** 8270E (SIM)

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/05/2023 1134

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | ND | 2.0 | 4.0 | N | 1 | 203 | 5.6 | 36-141 | 20 | 10/13/2023 1716 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 97 | 23-154 |
| 2-Methylnaphthalene-d10 | | 77 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Organochlorine Pesticides by GC - MB

**Sample ID:** YQ86402-001
**Batch:** 86402
**Analytical Method:** 8081B
**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/03/2023 1530

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Aldrin | 0.040 | U | 1 | 0.050 | 0.040 | 0.020 | ug/L | 10/04/2023 2130 |
| gamma-BHC (Lindane) | 0.040 | U | 1 | 0.050 | 0.040 | 0.017 | ug/L | 10/04/2023 2130 |
| alpha-BHC | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| beta-BHC | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| delta-BHC | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| cis-Chlordane | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| trans-Chlordane | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| 4,4'-DDD | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| 4,4'-DDE | 0.040 | U | 1 | 0.050 | 0.040 | 0.020 | ug/L | 10/04/2023 2130 |
| 4,4'-DDT | 0.040 | U | 1 | 0.050 | 0.040 | 0.020 | ug/L | 10/04/2023 2130 |
| Dieldrin | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| Endosulfan I | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| Endosulfan II | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| Endosulfan sulfate | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| Endrin | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| Endrin aldehyde | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| Endrin ketone | 0.030 | U | 1 | 0.040 | 0.030 | 0.015 | ug/L | 10/04/2023 2130 |
| Heptachlor | 0.050 | U | 1 | 0.060 | 0.050 | 0.021 | ug/L | 10/04/2023 2130 |
| Heptachlor epoxide | 0.040 | U | 1 | 0.050 | 0.040 | 0.016 | ug/L | 10/04/2023 2130 |
| Methoxychlor | 0.050 | U | 1 | 0.16 | 0.050 | 0.021 | ug/L | 10/04/2023 2130 |
| Toxaphene | 0.60 | U | 1 | 0.80 | 0.60 | 0.30 | ug/L | 10/04/2023 2130 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Decachlorobiphenyl | | 42 | 20-122 |
| Tetrachloro-m-xylene | | 93 | 44-124 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# Organochlorine Pesticides by GC - LCS

**Sample ID:** YQ86402-002
**Batch:** 86402
**Analytical Method:** 8081B
**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/03/2023 1530

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Aldrin | 0.80 | 0.72 | | 1 | 89 | 45-134 | 10/04/2023 2146 |
| gamma-BHC (Lindane) | 0.80 | 0.78 | | 1 | 97 | 59-134 | 10/04/2023 2146 |
| alpha-BHC | 0.80 | 0.79 | | 1 | 98 | 54-138 | 10/04/2023 2146 |
| beta-BHC | 0.80 | 0.68 | | 1 | 85 | 56-136 | 10/04/2023 2146 |
| delta-BHC | 0.80 | 0.76 | | 1 | 96 | 52-142 | 10/04/2023 2146 |
| cis-Chlordane | 0.80 | 0.68 | | 1 | 84 | 60-129 | 10/04/2023 2146 |
| trans-Chlordane | 0.80 | 0.69 | | 1 | 86 | 56-136 | 10/04/2023 2146 |
| 4,4'-DDD | 0.80 | 0.73 | | 1 | 91 | 56-143 | 10/04/2023 2146 |
| 4,4'-DDE | 0.80 | 0.64 | | 1 | 81 | 57-135 | 10/04/2023 2146 |
| 4,4'-DDT | 0.80 | 0.57 | | 1 | 71 | 51-143 | 10/04/2023 2146 |
| Dieldrin | 0.80 | 0.76 | | 1 | 95 | 60-136 | 10/04/2023 2146 |
| Endosulfan I | 0.80 | 0.69 | | 1 | 87 | 62-126 | 10/04/2023 2146 |
| Endosulfan II | 0.80 | 0.69 | | 1 | 86 | 52-135 | 10/04/2023 2146 |
| Endosulfan sulfate | 0.80 | 0.72 | | 1 | 90 | 62-133 | 10/04/2023 2146 |
| Endrin | 0.80 | 0.60 | | 1 | 75 | 60-138 | 10/04/2023 2146 |
| Endrin aldehyde | 0.80 | 0.72 | | 1 | 90 | 51-132 | 10/04/2023 2146 |
| Endrin ketone | 0.80 | 0.81 | | 1 | 102 | 58-134 | 10/04/2023 2146 |
| Heptachlor | 0.80 | 0.64 | | 1 | 80 | 54-130 | 10/04/2023 2146 |
| Heptachlor epoxide | 0.80 | 0.70 | | 1 | 87 | 61-133 | 10/04/2023 2146 |
| Methoxychlor | 0.80 | 0.60 | | 1 | 75 | 54-145 | 10/04/2023 2146 |
| Toxaphene | 1.0 | 1.6 | N | 1 | 163 | 33-134 | 10/04/2023 2201 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Decachlorobiphenyl | | 51 | 20-122 |
| Tetrachloro-m-xylene | | 93 | 44-124 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Organochlorine Pesticides by GC - MS

**Sample ID:** YI30001-001MS
**Batch:** 86402
**Analytical Method:** 8081B

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/03/2023 1530

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | 1.6 | 1.4 | | 1 | 88 | 45-134 | 10/04/2023 2248 |
| gamma-BHC (Lindane) | ND | 1.6 | 1.4 | P | 1 | 90 | 59-134 | 10/04/2023 2248 |
| alpha-BHC | ND | 1.6 | 1.6 | | 1 | 97 | 54-138 | 10/04/2023 2248 |
| beta-BHC | ND | 1.6 | 1.3 | | 1 | 84 | 56-136 | 10/04/2023 2248 |
| delta-BHC | ND | 1.6 | 1.5 | | 1 | 97 | 52-142 | 10/04/2023 2248 |
| cis-Chlordane | ND | 1.6 | 1.3 | | 1 | 83 | 60-129 | 10/04/2023 2248 |
| trans-Chlordane | ND | 1.6 | 1.4 | | 1 | 86 | 56-136 | 10/04/2023 2248 |
| 4,4'-DDD | ND | 1.6 | 1.5 | | 1 | 91 | 56-143 | 10/04/2023 2248 |
| 4,4'-DDE | ND | 1.6 | 1.3 | | 1 | 81 | 57-135 | 10/04/2023 2248 |
| 4,4'-DDT | ND | 1.6 | 1.2 | | 1 | 78 | 51-143 | 10/04/2023 2248 |
| Dieldrin | ND | 1.6 | 1.5 | | 1 | 93 | 60-136 | 10/04/2023 2248 |
| Endosulfan I | ND | 1.6 | 1.4 | | 1 | 87 | 62-126 | 10/04/2023 2248 |
| Endosulfan II | ND | 1.6 | 1.4 | | 1 | 87 | 52-135 | 10/04/2023 2248 |
| Endosulfan sulfate | ND | 1.6 | 1.4 | | 1 | 90 | 62-133 | 10/04/2023 2248 |
| Endrin | ND | 1.6 | 1.2 | | 1 | 73 | 60-138 | 10/04/2023 2248 |
| Endrin aldehyde | ND | 1.6 | 1.4 | | 1 | 90 | 51-132 | 10/04/2023 2248 |
| Endrin ketone | ND | 1.6 | 1.6 | | 1 | 103 | 58-134 | 10/04/2023 2248 |
| Heptachlor | ND | 1.6 | 1.3 | | 1 | 80 | 54-130 | 10/04/2023 2248 |
| Heptachlor epoxide | ND | 1.6 | 1.4 | | 1 | 86 | 61-133 | 10/04/2023 2248 |
| Methoxychlor | ND | 1.6 | 1.3 | | 1 | 80 | 54-145 | 10/04/2023 2248 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Decachlorobiphenyl | | 62 | 20-122 |
| Tetrachloro-m-xylene | | 91 | 44-124 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Organochlorine Pesticides by GC - MSD

**Sample ID:** YI30001-001MD
**Batch:** 86402
**Analytical Method:** 8081B

**Matrix:** Aqueous
**Prep Method:** 3520C
**Prep Date:** 10/03/2023 1530

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|
| Aldrin | ND | 1.6 | 1.4 | | 1 | 88 | 0.050 | 45-134 | 30 | 10/04/2023 2303 |
| gamma-BHC (Lindane) | ND | 1.6 | 1.4 | P | 1 | 90 | 0.076 | 59-134 | 30 | 10/04/2023 2303 |
| alpha-BHC | ND | 1.6 | 1.6 | | 1 | 97 | 0.019 | 54-138 | 30 | 10/04/2023 2303 |
| beta-BHC | ND | 1.6 | 1.3 | | 1 | 84 | 0.77 | 56-136 | 30 | 10/04/2023 2303 |
| delta-BHC | ND | 1.6 | 1.5 | | 1 | 95 | 1.5 | 52-142 | 30 | 10/04/2023 2303 |
| cis-Chlordane | ND | 1.6 | 1.3 | | 1 | 83 | 0.41 | 60-129 | 30 | 10/04/2023 2303 |
| trans-Chlordane | ND | 1.6 | 1.4 | | 1 | 86 | 0.46 | 56-136 | 30 | 10/04/2023 2303 |
| 4,4'-DDD | ND | 1.6 | 1.4 | | 1 | 90 | 1.1 | 56-143 | 30 | 10/04/2023 2303 |
| 4,4'-DDE | ND | 1.6 | 1.3 | | 1 | 81 | 0.36 | 57-135 | 30 | 10/04/2023 2303 |
| 4,4'-DDT | ND | 1.6 | 1.2 | | 1 | 73 | 6.1 | 51-143 | 30 | 10/04/2023 2303 |
| Dieldrin | ND | 1.6 | 1.5 | | 1 | 95 | 1.3 | 60-136 | 30 | 10/04/2023 2303 |
| Endosulfan I | ND | 1.6 | 1.4 | | 1 | 87 | 0.24 | 62-126 | 30 | 10/04/2023 2303 |
| Endosulfan II | ND | 1.6 | 1.4 | | 1 | 84 | 3.3 | 52-135 | 30 | 10/04/2023 2303 |
| Endosulfan sulfate | ND | 1.6 | 1.4 | | 1 | 89 | 1.2 | 62-133 | 30 | 10/04/2023 2303 |
| Endrin | ND | 1.6 | 1.2 | | 1 | 73 | 0.50 | 60-138 | 30 | 10/04/2023 2303 |
| Endrin aldehyde | ND | 1.6 | 1.4 | | 1 | 89 | 1.2 | 51-132 | 30 | 10/04/2023 2303 |
| Endrin ketone | ND | 1.6 | 1.6 | | 1 | 102 | 1.4 | 58-134 | 30 | 10/04/2023 2303 |
| Heptachlor | ND | 1.6 | 1.3 | | 1 | 79 | 0.62 | 54-130 | 30 | 10/04/2023 2303 |
| Heptachlor epoxide | ND | 1.6 | 1.4 | | 1 | 87 | 0.35 | 61-133 | 30 | 10/04/2023 2303 |
| Methoxychlor | ND | 1.6 | 1.2 | | 1 | 75 | 5.5 | 54-145 | 30 | 10/04/2023 2303 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Decachlorobiphenyl | | 61 | 20-122 |
| Tetrachloro-m-xylene | | 92 | 44-124 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# Chain of Custody
# and
# Miscellaneous Documents

# CHAIN-OF-CUSTODY RECORD

Ghate Environmental Associates, Inc.
Elizabeth Rivine
305 Sasanqua Drive, Greenville, SC 29615
864-682-6890, Erhine@bhate.com

COOLER 1

**COC # COC0923_BHAT**
**Page 1 of 2**

| | | |
|---|---|---|
| **Project Name:** Joint Base Charleston Air, Long Term Monitoring | **Laboratory:** Pace Analytical Services, LLC, West Columbia, SC | Event: 2023 Routine Sampling |
| **Project Number:** CHRTN-LTM/SAS2300.1000.02 | **POC:** Scott Gotshall, General Manager, 803.973.0868, scott.gotshall@pacelabs.com | |
| **WBS Code:** | **Ship to:** 106 Vantage Point Drive, West Columbia, SC 29172 | |

**Comments:**
BNASIM (A) = BNA SIM
BNASIM (A) = PLACEHOLDER to activate screening checks
SW8081 (A) = Pesticides

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 6 | 1x 1 L Amber glass bottle with Teflon lined cap, Cool to 0° to 6 °C, protected from light, in sealed vials with PTFE-lined septa |
| 23 | 1x 1 L Amber glass bottle with Teflon lined cap, Cool 0° to 6°C |
| 31 | 3x VOA, 40 mL Clear glass vial with Teflon lined septa, Cool 0° to 6°C |

YI30001

XE82

**Equipment:**

Event: 2023 Routine Sampling

| | Sample ID | Matrix | Date | Time | Samp Init | Analytical Test Method: 8270E SIM - PCP (A) (6) | Naphthalene (8270E) - BNASIM (A) (6) | Pesticides - SW8081 (A) (23) | SW8260D - VOCs (31) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Z2-02_0923 | WG | 9/28/2023 | 1546 | JT | X | | X | X | Z2-02 | N1 | 8 | 18 | | |
| 17 | Z2-04_0923 | WG | 9/28/2023 | 1451 | JT | X | | | X | Z2-04 | N1 | 8 | 38 | | |
| 17 | Z2-04_0923-MS | WG | 9/28/2023 | 1451 | JT | | | | X | Z2-04 | MS | 8 | 38 | | |
| 17 | Z2-04_0923-MSD | WG | 9/28/2023 | 1451 | JT | | | | X | Z2-04 | MSD | 8 | 38 | | |
| 15 | Z2-04_0923-a | WG | 9/28/2023 | 1451 | JT | | | | X | Z2-04 | FD | 8 | 38 | | |
| 6 | Z2-12_0923 | WG | 9/29/2023 | 920 | CR | X | | | X | Z2-12 | N1 | 9.1 | 19.1 | | |
| 14 | Z2-32_0923 | WG | 9/29/2023 | 1025 | CR | X | | | X | Z2-32 | N1 | 2.5 | 12.5 | | |
| 16 | Z2-36_0923 | WG | 9/28/2023 | 1301 | JT | X | | | X | Z2-36 | N1 | 3.5 | 13.5 | | |
| 28 | Z2-T3_0923 | WG | 9/29/2023 | 1255 | CR | X | | | X | Z2-T3 | N1 | 5.5 | 15.5 | | |
| 9 | Z2-138-01_0923 | WG | 9/29/2023 | 1200 | CR | X | | | | Z2-138-01 | N1 | 3 | 13 | | |
| 34 | TB08_0923-C | WQ | 9/28/2023 | 1301 | - | | | | X | FIELDQC | TB | 0 | 0 | | *Two VOAs |

**Turnaround Time: NA**

Released by Caitlin Ryan — Signature [signature] — Date/Time: 9/29/2023 @0915 PM — Relinquished to PACE Lab [signature] — Shipping No. _____ — Date/Time 9/29/23 2015

Released by _____ — Signature _____ — Date/Time _____ — Relinquished to _____ — Other _____ — Date/Time _____

Released by _____ — Signature _____ — Date/Time _____ — Relinquished to _____ — Date/Time _____

5.5 °C, 9.7, 9.8

PACE ANALYTICAL SERVICES, LLC

# CHAIN-OF-CUSTODY RECORD

Bhate Environmental Associates, Inc.
Elizabeth Rhine
306 Sasanqua Drive, Greenville, SC 29615
864-992-9890, Erhine@bhate.com

**COC # COC0923_BHAT0**


| | | |
|---|---|---|
| **Project Name:** Joint Base Charleston Air, Long Term Monitoring | **Laboratory:** Pace Analytical Services, LLC, West Columbia, SC | Event: 2023 Routine Sampling |
| **Project Number:** CHRTN-LTM/SAS2300.1000.02 | **POC:** Scott Gotshall, General Manager, 803.973.0558, scott.gotshall@pacelabs.com | |
| **WBS Code:** | **Ship to:** 106 Vantage Point Drive, West Columbia, SC 29172 | |

**Comments:**
BNASIM (A) = BNA SIM
BNASIM (A) = PLACEHOLDER to antiyam screening checks
SW8081 (A) = Pesticides

**Equipment:**

| Code | Matrix |
|---|---|
| WG | Ground Water |

| Code | Container/Preservative |
|---|---|
| 6 | 1x 1 L Amber glass bottle with Teflon lined cap, Cool to 0° to 6 °C, protected from light, in sealed vials with PTFE-lined septa |
| 23 | 1x 1 L Amber glass bottle with Teflon lined cap, Cool 0° to 6°C |
| 31 | 3x VOA, 40 ml, Clear glass vial with Teflon lined septa, Cool 0° to 6°C |

Y130001

KES?

Event: 2023 Routine Sampling

| | Sample ID | Matrix | Date | Time | Samp Init. | Analytical Test Method: 8270E SIM - PCP (A) (6) | Naphthalene (8270E) - BNASIM (A) (6) | Pesticides - SW8081 (A) (23) | SW8260D - VOCs (31) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Z2-11_0923 | WG | 9/28/2023 | 1655 | CR | X | | | X | Z2-11 | N1 | 10 | 35 | | |
| 5 | Z2-11_0923-MS | WG | 9/28/2023 | 1655 | CR | X | | | | Z2-11 | MS | 10 | 35 | | |
| 5 | Z2-11_0923-MSD | WG | 9/28/2023 | 1655 | CR | X | | | | Z2-11 | SD | 10 | 35 | | |
| 18 | Z2-45_0923 | WG | 9/28/2023 | 1310 | RS | X | | | X | Z2-45 | N1 | 5.5 | 15.5 | | |
| 18 | Z2-45_0923-a | WG | 9/28/2023 | 1310 | RS | | | | X | Z2-45 | FD | 5.5 | 15.5 | | |
| 18 | Z2-45_0923-MS | WG | 9/28/2023 | 1310 | RS | X | | | | Z2-45 | MS | 5.5 | 15.5 | | |
| 18 | Z2-45_0923-MSD | WG | 9/28/2023 | 1310 | RS | X | | | | Z2-45 | SD | 5.5 | 15.5 | | |
| 20 | Z2-50_0923 | WG | 9/28/2023 | 1515 | CR | X | | | X | Z2-50 | N1 | 25 | 40 | | |
| 21 | Z2-52R_0923 | WG | 9/28/2023 | 1600 | CR | X | | | X | Z2-52R | N1 | 6 | 16 | | |
| 22 | Z2-53_0923 | WG | 9/28/2023 | 1440 | CR | X | | | X | Z2-53 | N1 | 1 | 11 | | |
| 23 | Z2-54_0923 | WG | 9/29/2023 | 1415 | CR | X | | | X | Z2-54 | N1 | 4 | 14 | | |
| 1 | MW-01-129_0923 | WG | 9/29/2023 | 1555 | CR | | X | | X | MW-01-129 | N1 | 6 | 16 | | |
| 1 | MW-01-129_0923-a | WG | 9/29/2023 | 1555 | CR | | X | | X | MW-01-129 | FD | 6 | 16 | | |

Released by Caitlin Ryan Signature [signature] Date/Time 9/29/2023 @ 0815 Relinquished to PACE Lab Shipping No. ____ Date/Time 9/29/23 2015

Released by ____ Signature ____ Date/Time ____ Relinquished to ____ Other ____ Date/Time ____

Released by ____ Signature ____ Date/Time ____ Relinquished to ____ Date/Time ____

5.6°C, 5.7, 5.8

PACE ANALYTICAL SERVICES, LLC

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

# Sample Receipt Checklist (SRC)

Client: ARCADIS  Cooler Inspected by/date: CBP / 09/29/23  Lot #: YI30001

| | | | |
|---|---|---|---|
| Means of receipt: ☐ Pace ☑ Client ☐ UPS ☐ FedEx ☐ Other: | | | |
| ☐ Yes | ☑ No | | 1. Were custody seals present on the cooler? |
| ☐ Yes | ☐ No | ☑ NA | 2. If custody seals were present, were they intact and unbroken? |

pH Strip ID: NA  Chlorine Strip ID: NA  Tested by: NA
Original temperature upon receipt / Derived (Corrected) temperature upon receipt  %Solid Snap-Cup ID: NA
5.5 / 5.5 °C  5.7 / 5.7 °C  5.8 / 5.8 °C  NA / NA °C
Method: ☑ Temperature Blank ☐ Against Bottles  IR Gun ID: 8  IR Gun Correction Factor: 0 °C
Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

| | | | |
|---|---|---|---|
| ☑ Yes | ☐ No | ☐ NA | 3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one). |
| ☐ Yes | ☐ No | ☑ NA | 4. Is the commercial courier's packing slip attached to this form? |
| ☑ Yes | ☐ No | | 5. Were proper custody procedures (relinquished/received) followed? |
| ☑ Yes | ☐ No | | 6. Were sample IDs listed on the COC and all sample containers? |
| ☑ Yes | ☐ No | | 7. Was collection date & time listed on the COC and all sample containers? |
| ☑ Yes | ☐ No | | 8. Did all container label information (ID, date, time) agree with the COC? |
| ☑ Yes | ☐ No | | 9. Were tests to be performed listed on the COC? |
| ☑ Yes | ☐ No | | 10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? |
| ☑ Yes | ☐ No | | 11. Was adequate sample volume available? |
| ☑ Yes | ☐ No | | 12. Were all samples received within ½ the holding time or 48 hours, whichever comes first? |
| ☑ Yes | ☐ No | | 13. Were all samples containers accounted for? (No missing/excess) |
| ☐ Yes | ☑ No | ☐ NA | 14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials? |
| ☐ Yes | ☐ No | ☑ NA | 15. Were all DRO/metals/nutrient samples received at a pH of < 2? |
| ☐ Yes | ☐ No | ☑ NA | 16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9? |
| ☐ Yes | ☐ No | ☑ NA | 17. Were all applicable $NH_3$/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine? |
| ☐ Yes | ☑ No | ☐ NA | 18. Was the quote number listed on the container label? If yes, Quote # |

**Sample Preservation** (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) 1(3); 2(7); 5(3); 11(1); 12(4) were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360  Pace® Analytical Services, LLC  Page 1 of 1

# Report of Analysis

**Bhate**
1608 13th Avenue South
Suite 300
Birmingham, AL 35205
Attention: Marcia Olive

Project Name: JBCA Routine Samp-Main Co

Project Number: 30193131.LTM Field - 07

Lot Number:**ZD22015**

Date Completed:04/29/2024

Kathy Smith

04/29/2024 6:19 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.


Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

## Case Narrative
## Bhate
### Lot Number: ZD22015

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report. Where sampling is conducted by the client, results relate to the accuracy of the information provided, and as the samples are received.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Additionally, the DoD QSM version 5.4 has been followed for these samples. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs, the DoD QSM, or policies are qualified on the results page or discussed below.

Pace is a DoD/DOE accredited laboratory; however, the following analyses are currently not listed on our DoD/DOE scope of accreditation: Drinking Water: pH EPA 150.1, Turbidity EPA 180.1, Metals EPA 200.7 & 200.8, Mercury EPA 245.1, Anions EPA 300.0, Cyanide EPA 335.4, Nitrates EPA 353.2, Orthophosphate & Phosphorus EPA 365.1, EDB/DBCP EPA 504.1, HPC SIMPLATE, Color SM 2120 B-2011, Alkalinity SM 2320 B-2011, Specific Conductance SM 2510 B-2011, Residue-filterable (TDS) SM 2540 C, Calcium Hardness (CaCO2) SM 3500-Ca B-2011, TRC SM 4500 Cl G-2011, pH SM 4500 H=B-2011, E.Coli, Total Coliform. Non-Potable Water: Metals EPA 200.7, Strontium EPA 200.8, Chlorate EPA 300.0, Cyanide EPA 335.4, Phenolics EPA 420.4, 2-Methyl-4,6-Dinitrophenol EPA 625.1, Propane RSK-175, Specific Conductance SM 2510 B-2011, Salinity SM2520 B, Residue- total SM 2540 B, Sulfite SM 4500 SO32- B-2011, Amenable Cyanide SM 4500-CN- G-2011, BOD & CBOD SM 5210 B, MBAS SM 5540 C-2011, Boron & Titanium SW-846 6010D, Boron, Molybdenum, & Titanium SW-846 6020B, Alcohols & Glycols SW-846 8015C, Pentachlorophenol SW-846 8151A, Ethyl Acetate, Hexane, & n-Hexane SW-846 8260D, SVOC 1,4-Dioxane, 4-Dimethyl aminoazobenzene, 1,4-Naphthoquinone, 3,5-Dinitroaniline, PETN SW-846 8270E, Amenable Cyanide SW-846 9012B. Solid and Chemical Materials: Boron & Titanium SW-846 6010D, Molybdenum SW-846 6020B, Ethylene Glycol SW-846 8015B, Pentachlorophenol SW-846 8151A, Chloroprene SW-846 8260B, SVOC 1,4-Dioxane, 1,3,5-Trinitrobenzene, 1,4- Naphthoquinone, 1,4-Phenylenediamine, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 3-Methylcholanthrene, 4-Aminobiphenyl, 4-Dimethyl aminoazobenzene, 4-Nitroquinoline-1-oxide, 7,12-Dimethylbenzo(a)anthracene, Chlorobenzilate, Diallate, Ethyl methanesulfonate, Isodrin, Isosafrole, Methyl methanesulfonate, n-Nitrosomethylethylamine, n-Nitrosomorpholine, n-Nitrosopiperidine, Piperonyl butoxide, Pronamide, Safrole, 3,5- Dinitroaniline, PETN SW-846 8270E, Oil & Grease SW-846 9071B.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18. If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Semivolatiles
The MS/MSD associated with samples ZD22015-001, ZD22015-002 had compounds recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

# Manual Integration Summary

## Bhate

Lot Number: ZD22015

Project Name: JBCA Routine Samp-Main Co

Project Number: 30193131.LTM Field - 07

Where applicable, analytes for which manual integration occurred have been flagged with the following:

| Qualifier | Technical Justification | Qualifier | Technical Justification | Qualifier | Technical Justification |
|---|---|---|---|---|---|
| M-01 | Split peak | M-07 | Low fit | M-13 | Error |
| M-02 | Peak tailing | M-08 | Peak not found | M-14 | Baseline |
| M-03 | Incorrect auto integration | M-09 | Analyte not Identified by the Data System | M-15 | Other |
| M-04 | Poor chromatography | M-10 | Analyte misidentified by the Data System | M-16 | Retention time shift |
| M-05 | Manually assigned peak | M-11 | Invalid integration | M-17 | Shouldering |
| M-06 | Wrong isomer | M-12 | Wrong peak | | |

A summary of instances where manual integration occurred is included below:

| Method | Sample | Run Number | Parameter | Qualifier |
|---|---|---|---|---|
| 8270E (SIM) | ZD22015-001 | 1 | Fluoranthene-d10 | M-05 |

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

# Sample Summary

## Bhate

Lot Number: ZD22015

Project Name: JBCA Routine Samp-Main Co

Project Number: 30193131.LTM Field - 07

| Sample Number | Sample ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| 001 | TU544_MW-1R-129_0424 | Aqueous | 04/18/2024 1940 | 04/22/2024 |
| 002 | TU544_MW-1R-129_0424-a | Aqueous | 04/18/2024 1940 | 04/22/2024 |
| 003 | TU544_MW-1R-129_0424-C | Aqueous | 04/18/2024 1941 | 04/22/2024 |

(3 samples)

# Detection Summary

## Bhate

Lot Number: ZD22015

Project Name: JBCA Routine Samp-Main Co

Project Number: 30193131.LTM Field - 07

| Sample | Sample ID | Matrix | Parameter | Method | Result | Q | Units | Page |
|---|---|---|---|---|---|---|---|---|
| 001 | TU544_MW-1R-129_0424 | Aqueous | Naphthalene | 8260D | 220 | | ug/L | 6 |
| 001 | TU544_MW-1R-129_0424 | Aqueous | Naphthalene | 8270E (SIM) | 150 | S | ug/L | 7 |
| 002 | TU544_MW-1R-129_0424-a | Aqueous | Naphthalene | 8260D | 230 | | ug/L | 8 |
| 002 | TU544_MW-1R-129_0424-a | Aqueous | Naphthalene | 8270E (SIM) | 130 | S | ug/L | 9 |

(4 detections)

# Volatile Organic Compounds by GC/MS

Client: Bhate
Laboratory ID: ZD22015-001
Description: TU544_MW-1R-129_0424
Matrix: Aqueous
Date Sampled: 04/18/2024 1940
Project Name: JBCA Routine Samp-Main Co
Date Received: 04/22/2024
Project Number: 30193131.LTM Field - 07

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 04/25/2024 1311 | DPH | | 10675 |
| 2 | 5030B | 8260D | 5 | 04/26/2024 1732 | DPH | | 10744 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 91-20-3 | 8260D | 220 | | 5.0 | 4.0 | 2.0 | ug/L | 2 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits | Q | Run 2 % Recovery | Acceptance Limits |
|---|---|---|---|---|---|---|
| Bromofluorobenzene | | 109 | 85-114 | | 111 | 85-114 |
| Dibromofluoromethane | | 88 | 80-119 | | 88 | 80-119 |
| 1,2-Dichloroethane-d4 | | 85 | 81-118 | | 86 | 81-118 |
| Toluene-d8 | | 96 | 89-112 | | 95 | 89-112 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: Bhate | Laboratory ID: ZD22015-001

Description: TU544_MW-1R-129_0424 | Matrix: Aqueous

Date Sampled: 04/18/2024 1940 | Project Name: JBCA Routine Samp-Main Co

Date Received: 04/22/2024 | Project Number: 30193131.LTM Field - 07

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 100 | 04/25/2024 1527 | JCG | 04/23/2024 1316 | 10513 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 91-20-3 | 8270E (SIM) | 150 | S | 32 | 9.6 | 4.8 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | M-05 | 70 | 23-154 |
| 2-Methylnaphthalene-d10 | | 85 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: Bhate
Laboratory ID: ZD22015-002
Description: TU544_MW-1R-129_0424-a
Matrix: Aqueous
Date Sampled: 04/18/2024 1940
Project Name: JBCA Routine Samp-Main Co
Date Received: 04/22/2024
Project Number: 30193131.LTM Field - 07

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 04/25/2024 1333 | DPH | | 10675 |
| 2 | 5030B | 8260D | 5 | 04/26/2024 1754 | DPH | | 10744 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 91-20-3 | 8260D | 230 | | 5.0 | 4.0 | 2.0 | ug/L | 2 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits | Q | Run 2 % Recovery | Acceptance Limits |
|---|---|---|---|---|---|---|
| Bromofluorobenzene | | 108 | 85-114 | | 112 | 85-114 |
| Dibromofluoromethane | | 87 | 80-119 | | 89 | 80-119 |
| 1,2-Dichloroethane-d4 | | 84 | 81-118 | | 87 | 81-118 |
| Toluene-d8 | | 95 | 89-112 | | 96 | 89-112 |

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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# Semivolatile Organic Compounds by GC/MS (SIM)

Client: Bhate | Laboratory ID: ZD22015-002

Description: TU544_MW-1R-129_0424-a | Matrix: Aqueous

Date Sampled: 04/18/2024 1940 | Project Name: JBCA Routine Samp-Main Co

Date Received: 04/22/2024 | Project Number: 30193131.LTM Field - 07

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 3520C | 8270E (SIM) | 100 | 04/25/2024 1646 | JCG | 04/23/2024 1316 | 10513 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 91-20-3 | 8270E (SIM) | 130 | S | 65 | 20 | 9.7 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Fluoranthene-d10 | | 61 | 23-154 |
| 2-Methylnaphthalene-d10 | | 64 | 15-139 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# Volatile Organic Compounds by GC/MS

Client: Bhate | Laboratory ID: ZD22015-003

Description: TU544_MW-1R-129_0424-C | Matrix: Aqueous

Date Sampled: 04/18/2024 1941 | Project Name: JBCA Routine Samp-Main Co

Date Received: 04/22/2024 | Project Number: 30193131.LTM Field - 07

| Run | Prep Method | Analytical Method | Dilution | Analysis Date | Analyst | Prep Date | Batch |
|---|---|---|---|---|---|---|---|
| 1 | 5030B | 8260D | 1 | 04/25/2024 1226 | DPH | | 10675 |

| Parameter | CAS Number | Analytical Method | Result | Q | LOQ | LOD | DL | Units | Run |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 91-20-3 | 8260D | 0.80 | U | 1.0 | 0.80 | 0.40 | ug/L | 1 |

| Surrogate | Q | Run 1 % Recovery | Acceptance Limits |
|---|---|---|---|
| Bromofluorobenzene | | 108 | 85-114 |
| Dibromofluoromethane | | 86 | 80-119 |
| 1,2-Dichloroethane-d4 | | 85 | 81-118 |
| Toluene-d8 | | 96 | 89-112 |

| | | | | |
|---|---|---|---|---|
| LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure |
| U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure |
| H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | | S = MS/MSD failure |

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# QC Summary

# Volatile Organic Compounds by GC/MS - MB

Sample ID: ZQ10675-001
Batch: 10675
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 04/25/2024 1121 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 107 | 85-114 |
| Dibromofluoromethane | | 85 | 80-119 |
| 1,2-Dichloroethane-d4 | | 85 | 81-118 |
| Toluene-d8 | | 94 | 89-112 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - LCS

Sample ID: ZQ10675-002
Batch: 10675
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Naphthalene | 50 | 50 | | 1 | 99 | 61-128 | 04/25/2024 0958 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 99 | 85-114 |
| Dibromofluoromethane | | 97 | 80-119 |
| 1,2-Dichloroethane-d4 | | 101 | 81-118 |
| Toluene-d8 | | 101 | 89-112 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - MS

Sample ID: ZD22015-001MS
Batch: 10675
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | 220 | 50 | 250 | E | 1 | 73 | 61-128 | 04/25/2024 1417 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 101 | 85-114 |
| Dibromofluoromethane | | 97 | 80-119 |
| 1,2-Dichloroethane-d4 | | 97 | 81-118 |
| Toluene-d8 | | 101 | 89-112 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - MSD

Sample ID: ZD22015-001MD
Batch: 10675
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 220 | 50 | 260 | E | 1 | 79 | 1.3 | 61-128 | 20 | 04/25/2024 1438 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 102 | 85-114 |
| Dibromofluoromethane | | 100 | 80-119 |
| 1,2-Dichloroethane-d4 | | 99 | 81-118 |
| Toluene-d8 | | 103 | 89-112 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - MB

Sample ID: ZQ10744-001
Batch: 10744
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | 0.80 | U | 1 | 1.0 | 0.80 | 0.40 | ug/L | 04/26/2024 1034 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 109 | 85-114 |
| Dibromofluoromethane | | 87 | 80-119 |
| 1,2-Dichloroethane-d4 | | 85 | 81-118 |
| Toluene-d8 | | 95 | 89-112 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Volatile Organic Compounds by GC/MS - LCS

Sample ID: ZQ10744-002
Batch: 10744
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Naphthalene | 50 | 49 | | 1 | 98 | 61-128 | 04/26/2024 0937 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Bromofluorobenzene | | 96 | 85-114 |
| Dibromofluoromethane | | 95 | 80-119 |
| 1,2-Dichloroethane-d4 | | 97 | 81-118 |
| Toluene-d8 | | 96 | 89-112 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Semivolatile Organic Compounds by GC/MS (SIM) - MB

Sample ID: ZQ10513-001
Batch: 10513
Analytical Method: 8270E (SIM)

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 04/23/2024 1316

| Parameter | Result | Q | Dil | LOQ | LOD | DL | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | 0.060 | U | 1 | 0.20 | 0.060 | 0.030 | ug/L | 04/25/2024 1250 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 79 | 23-154 |
| 2-Methylnaphthalene-d10 | | 77 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Semivolatile Organic Compounds by GC/MS (SIM) - LCS

Sample ID: ZQ10513-002
Batch: 10513
Analytical Method: 8270E (SIM)

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 04/23/2024 1316

| Parameter | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|
| Naphthalene | 0.60 | 0.43 | | 1 | 72 | 43-114 | 04/25/2024 1316 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 81 | 23-154 |
| 2-Methylnaphthalene-d10 | | 78 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Semivolatile Organic Compounds by GC/MS (SIM) - MS

Sample ID: ZD22015-001MS
Batch: 10513
Analytical Method: 8270E (SIM)

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 04/23/2024 1316

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | 150 | 0.97 | 120 | N | 100 | -2800 | 43-114 | 04/25/2024 1553 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 60 | 23-154 |
| 2-Methylnaphthalene-d10 | | 76 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Semivolatile Organic Compounds by GC/MS (SIM) - MSD

Sample ID: ZD22015-001MD
Batch: 10513
Analytical Method: 8270E (SIM)

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 04/23/2024 1316

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 150 | 0.98 | 130 | N | 100 | -1680 | 8.3 | 43-114 | 20 | 04/25/2024 1620 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 69 | 23-154 |
| 2-Methylnaphthalene-d10 | | 73 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Semivolatile Organic Compounds by GC/MS (SIM) - MS

Sample ID: ZD22015-002MS
Batch: 10513
Analytical Method: 8270E (SIM)

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 04/23/2024 1316

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | %Rec Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | 130 | 4.0 | 160 | N | 100 | 794 | 43-114 | 04/25/2024 1712 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 62 | 23-154 |
| 2-Methylnaphthalene-d10 | | 60 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

# Semivolatile Organic Compounds by GC/MS (SIM) - MSD

Sample ID: ZD22015-002MD
Batch: 10513
Analytical Method: 8270E (SIM)

Matrix: Aqueous
Prep Method: 3520C
Prep Date: 04/23/2024 1316

| Parameter | Sample Amount (ug/L) | Spike Amount (ug/L) | Result (ug/L) | Q | Dil | % Rec | % RPD | %Rec Limit | % RPD Limit | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 130 | 4.0 | 160 | N | 100 | 765 | 0.73 | 43-114 | 20 | 04/25/2024 1738 |

| Surrogate | Q | % Rec | Acceptance Limit |
|---|---|---|---|
| Fluoranthene-d10 | | 62 | 23-154 |
| 2-Methylnaphthalene-d10 | | 65 | 15-139 |

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

# CHAIN-OF-CUSTODY RECORD


BEAB
Elizabeth Rhine
445 Union Boulevard, Suite 129, Lakewood, CO 80228
(303) 463.3906, mpilve@bhate.com


**COC # TU544_MW-1R-129_0424**

| | | |
|---|---|---|
| Project Name: JBCA Routine Samp-Main Co | Laboratory: Pace Analytical Services, LLC, West Columbia, SC | Event: JBCA Routine Samp-Main Co |
| Project Number: SAS2300.1000.02.MAIN | POC: Kathy Smith, 912.465.7601, Kathy.Smith@pacelabs.com | |
| WBS Code: | Ship to: 106 Vantage Point Dr. West Columbia, SC 29172 | |

Comments:
SW8270SIM (A) = ***Napthalene Only***
SW8260D (A) = ***Napthalene Only***

Equipment:

| Code | Matrix |
|---|---|
| WG | Ground Water |
| WQ | Water Quality Control Matrix |

| Code | Container/Preservative |
|---|---|
| 1 | 2x Amber Glass 250mL Cool to 0° to 6°C, protected from light |
| 2 | 3x VOA--40 mL Clear glass vial with Teflon liner septa, HCl Cool 0° to 6°C |

ZD22015
KE92

Event: 2024 Annual Basewide, CG604

| | Sample ID | Matrix | Date | Time | Samp Init. | Analytical Test Method: SW8270SIM (A) (1) | SW8260D (A) (2) | Location ID | Sample Type | Depth (ft bgs) Top | Depth (ft bgs) Bottom | Cooler | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | TU544_MW-1R-129_0424 | WG | 4/18/2024 | 1940 | CR | X | X | MW-1R-129 | N1 | NA | NA | 1 | First sample since well instal |
| 2 | TU544_MW-1R-129_0424-a | WG | 4/18/2024 | 1940 | CR | X | X | MW-1R-129 | FD1 | NA | NA | 1 | Well developed on 4/8/24 |
| | TU544_MW-1R-129_0424-MS | WG | 4/18/2024 | 1940 | CR | X | X | MW-1R-129 | MS1 | NA | NA | 1 | |
| 3 | TU544_MW-1R-129_0424-MSD | WG | 4/18/2024 | 1940 | CR | X | X | MW-1R-129 | MSD1 | NA | NA | 1 | |
| 4 | TU544_MW-1R-129_0424-C | WQ | 4/18/2024 | 1941 | CR | | X | FIELDQC | TB1 | NA | NA | 1 | |

Turnaround Time: NA

Relinquished by: *(Signature)* Carter Ryan
Date 4/19/24 @ 1030
Time
Received by: *(Signature)* Cody Rook
COC_TU544_0424

Date 4/22/24
Time 1005
Shipping Date:
Received by Laboratory: *(Signature, Date, Time)* & conditio

Relinquished: Fedex 4/22/24 1005

T = 1.1°C



PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

# Sample Receipt Checklist (SRC)

Client: BHATE | Cooler Inspected by/date: CDR / 4/22/24 | Lot #: ZD22015

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

| | | | |
|---|---|---|---|
| ☑ Yes | ☐ No | | 1. Were custody seals present on the cooler? |
| ☑ Yes | ☐ No | ☐ NA | 2. If custody seals were present, were they intact and unbroken? |

pH Strip ID: NA | Chlorine Strip ID: NA | Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt | %Solid Snap-Cup ID: NA

1.1 / 1.1 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

| | | | |
|---|---|---|---|
| ☑ Yes | ☐ No | ☐ NA | 3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one). |
| ☑ Yes | ☐ No | ☐ NA | 4. Is the commercial courier's packing slip attached to this form? |
| ☑ Yes | ☐ No | | 5. Were proper custody procedures (relinquished/received) followed? |
| ☑ Yes | ☐ No | | 6. Were sample IDs listed on the COC and all sample containers? |
| ☑ Yes | ☐ No | | 7. Was collection date & time listed on the COC and all sample containers? |
| ☑ Yes | ☐ No | | 8. Did all container label information (ID, date, time) agree with the COC? |
| ☑ Yes | ☐ No | | 9. Were tests to be performed listed on the COC? |
| ☑ Yes | ☐ No | | 10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? |
| ☑ Yes | ☐ No | | 11. Was adequate sample volume available? |
| ☑ Yes | ☐ No | | 12. Were all samples received within ½ the holding time or 48 hours, whichever comes first? |
| ☑ Yes | ☐ No | | 13. Were all samples containers accounted for? (No missing/excess) |
| ☑ Yes | ☐ No | ☐ NA | 14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials? |
| ☐ Yes | ☐ No | ☑ NA | 15. Were all DRO/metals/nutrient samples received at a pH of < 2? |
| ☐ Yes | ☐ No | ☑ NA | 16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9? |
| ☐ Yes | ☐ No | ☑ NA | 17. Were all applicable $NH_3$/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine? |
| ☐ Yes | ☐ No | ☑ NA | 18. Was the quote number listed on the container label? If yes, Quote # NA |

**Sample Preservation** (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: $H_2SO_4$, $HNO_3$, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 | Pace® Analytical Services, LLC | Page 1 of 1

| | |
|---|---|
| Facility: | Joint Base Charleston Air, Long Term Monitoring |
| Event: | 2023 Routine Sampling |
| SDG: | YI30001 |
| Guidance Document: | CHRTN UFP-QAPP |
| Prime Contractor: | Bhate Environmental Associates, Inc., Birmingham, AL |
| Project Manager: | Frank Gardner |
| Contract Laboratory(ies): | Pace Analytical Services, LLC, West Columbia, SC |
| Data Review Contractor: | Synectics, Sacramento, CA |
| Data Review Level: | S4VEM |
| Primary Data Reviewer: | Kathryn Cantone, Data Review Chemist |
| Second Reviewer: | Evin McKinney, Senior Scientist |
| Date Submitted: | April 18, 2024 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | BNASIME | SW8081B | SW8260D |
|---|---|---|---|---|---|---|
| MW-01-129_0923 | YI30001-017 | Water | Field Sample/N | X | | X |
| MW-01-129_0923-a | YI30001-018 | Water | Field Duplicate/FD | X | | X |
| TB08_0923-C | YI30001-009 | Water | Trip Blank/TB | | | X |
| Z2-02_0923 | YI30001-001 | Water | Field Sample/N | X | X | X |
| Z2-04_0923 | YI30001-002 | Water | Field Sample/N | X | | X |
| Z2-04_0923-a | YI30001-003 | Water | Field Duplicate/FD | | | X |
| Z2-11_0923 | YI30001-010 | Water | Field Sample/N | X | | X |
| Z2-12_0923 | YI30001-004 | Water | Field Sample/N | X | | X |
| Z2-138-01_0923 | YI30001-008 | Water | Field Sample/N | X | | |
| Z2-32_0923 | YI30001-005 | Water | Field Sample/N | X | | X |
| Z2-36_0923 | YI30001-006 | Water | Field Sample/N | X | | X |
| Z2-45_0923 | YI30001-011 | Water | Field Sample/N | X | | X |
| Z2-45_0923-a | YI30001-012 | Water | Field Duplicate/FD | | | X |
| Z2-50_0923 | YI30001-013 | Water | Field Sample/N | X | | X |
| Z2-52R_0923 | YI30001-014 | Water | Field Sample/N | X | | X |
| Z2-53_0923 | YI30001-015 | Water | Field Sample/N | X | | X |
| Z2-54_0923 | YI30001-016 | Water | Field Sample/N | X | | X |
| Z2-T3_0923 | YI30001-007 | Water | Field Sample/N | X | | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at S4VEM data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the CHRTN UFP-QAPP and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Bhate Environmental Associates, Inc., Birmingham, AL; analyses were performed by Pace Analytical Services, LLC, West Columbia, SC and were reported under sample delivery group (SDG) YI30001. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Field Duplicate RPD
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time
- Trip Blank

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 49 results (5.64%) out of the 869 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

It was noted that the parent sample for one MS/MSD pair is listed as Z2-04_0923 on the COC, however, the parent sample is listed as Z2-02_0923 in the EDD.

| Analytical Method | Data Reviewer Comment |
|---|---|
| BNASIME | No additional comments; see Checklist for detail. |
| SW8081B | No additional comments; see Checklist for detail. |
| SW8260D | No additional comments; see Checklist for detail. |

April 16, 2024

Reviewed by Kathryn Cantone, Data Review Chemist, Synectics, Sacramento, CA

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Evin McKinney, Senior Scientist, Synectics, Sacramento, CA

April 18, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method BNASIME, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| Z2-02_0923-MS (MS) YI30001-001MS | Pentachlorophenol | 193 | 36 - 141 | 10 - 141 | percent | J/None | M | |
| Z2-02_0923-MSD (SD) YI30001-001MD | Pentachlorophenol | 185 | 36 - 141 | 10 - 141 | percent | J/None | M | |
| Z2-11_0923-MS (MS) YI30001-010MS | Pentachlorophenol | 210 | 36 - 141 | 10 - 141 | percent | J/None | M | |
| Z2-11_0923-MSD (SD) YI30001-010MD | Pentachlorophenol | 190 | 36 - 141 | 10 - 141 | percent | J/None | M | |
| Z2-45_0923-MS (MS) YI30001-011MS | Pentachlorophenol | 200 | 36 - 141 | 10 - 141 | percent | J/None | M | |
| Z2-45_0923-MSD (SD) YI30001-011MD | Pentachlorophenol | 200 | 36 - 141 | 10 - 141 | percent | J/None | M | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW8081B, LCS Recovery**

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| YQ86402-002 (BS) YQ86402-002 | Toxaphene | 160 | 33 - 134 | 33 - 134 | percent | J/None | C | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW8260D, Continuing Calibration Verification**

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| VSTD050JN (CV) | 1,1-Dichloroethane | 76.1 | 80 - 120 | 80 - 120 | percent | J/UJ | V2 | |
| VSTD050JN (CV) | Chloroform | 78.5 | 80 - 120 | 80 - 120 | percent | J/UJ | V2 | |
| VSTD050JN (CV) | cis-1,2-Dichloroethene | 79.1 | 80 - 120 | 80 - 120 | percent | J/UJ | V2 | |
| VSTD050JN (CV) | Cyclohexane | 72.1 | 80 - 120 | 80 - 120 | percent | J/UJ | V2 | |
| VSTD050JV (CV) | 1,2,4-Trichlorobenzene | 78.2 | 80 - 120 | 80 - 120 | percent | J/UJ | V2 | |
| VSTD050JV (CV) | Acetone | 73.8 | 80 - 120 | 80 - 120 | percent | J/UJ | V2 | |
| VSTD050JV (CV) | Bromoform | 76.0 | 80 - 120 | 80 - 120 | percent | J/UJ | V2 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Continuing Calibration Verification for SW8260D**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| TB08_0923-C YI30001-009 | TB | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| TB08_0923-C YI30001-009 | TB | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| TB08_0923-C YI30001-009 | TB | cis-1,2-Dichloroethene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| TB08_0923-C YI30001-009 | TB | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-02_0923 YI30001-001 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-02_0923 YI30001-001 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-02_0923 YI30001-001 | N | cis-1,2-Dichloroethene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-02_0923 YI30001-001 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-04_0923 YI30001-002 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923 YI30001-002 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923 YI30001-002 | N | cis-1,2-Dichloroethene | 1.00 | 11.0 | 11.0 J | - | ug/l | V2 |
| Z2-04_0923 YI30001-002 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-04_0923-a YI30001-003 | FD | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923-a YI30001-003 | FD | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |

**Qualified Results associated with the Continuing Calibration Verification for SW8260D**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| Z2-04_0923-a YI30001-003 | FD | cis-1,2-Dichloroethene | 1.00 | 11.0 | 11.0 J | - | ug/l | V2 |
| Z2-04_0923-a YI30001-003 | FD | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-11_0923 YI30001-010 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-11_0923 YI30001-010 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-11_0923 YI30001-010 | N | cis-1,2-Dichloroethene | 1.00 | 0.790 | 0.790 J | | ug/l | I/TR/V2 |
| Z2-11_0923 YI30001-010 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-12_0923 YI30001-004 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-12_0923 YI30001-004 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-12_0923 YI30001-004 | N | cis-1,2-Dichloroethene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-12_0923 YI30001-004 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-36_0923 YI30001-006 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-36_0923 YI30001-006 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-36_0923 YI30001-006 | N | cis-1,2-Dichloroethene | 1.00 | 1.50 | 1.50 J | - | ug/l | V2 |
| Z2-36_0923 YI30001-006 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-45_0923 YI30001-011 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923 YI30001-011 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923 YI30001-011 | N | cis-1,2-Dichloroethene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-45_0923 YI30001-011 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-45_0923-a YI30001-012 | FD | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923-a YI30001-012 | FD | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923-a YI30001-012 | FD | cis-1,2-Dichloroethene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-45_0923-a YI30001-012 | FD | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-50_0923 YI30001-013 | N | 1,2,4-Trichlorobenzene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-50_0923 YI30001-013 | N | Acetone | 20.0 | 10.0 | 10.0 UJ | | ug/l | V1/V2 |
| Z2-50_0923 YI30001-013 | N | Bromoform | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-52R_0923 YI30001-014 | N | 1,2,4-Trichlorobenzene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-52R_0923 YI30001-014 | N | Acetone | 20.0 | 10.0 | 10.0 UJ | | ug/l | V1/V2 |

**Qualified Results associated with the Continuing Calibration Verification for SW8260D**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| Z2-52R_0923 YI30001-014 | N | Bromoform | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-53_0923 YI30001-015 | N | 1,2,4-Trichlorobenzene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-53_0923 YI30001-015 | N | Acetone | 20.0 | 10.0 | 10.0 UJ | | ug/l | V1/V2 |
| Z2-53_0923 YI30001-015 | N | Bromoform | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW8260D, Initial Calibration Verification**

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| VICV050EO 9/28/23 (IV) | Acetone | 63.5 | 80 - 120 | 80 - 120 | percent | J/UJ | V1 | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Initial Calibration Verification for SW8260D**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| Z2-50_0923 YI30001-013 | N | Acetone | 20.0 | 10.0 | 10.0 UJ | | ug/l | V1/V2 |
| Z2-52R_0923 YI30001-014 | N | Acetone | 20.0 | 10.0 | 10.0 UJ | | ug/l | V1/V2 |
| Z2-53_0923 YI30001-015 | N | Acetone | 20.0 | 10.0 | 10.0 UJ | | ug/l | V1/V2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW8260D, LCS Recovery**

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| YQ87040-002 (BS) YQ87040-002 | 1,1-Dichloroethane | 76.0 | 77 - 125 | 77 - 125 | percent | J/UJ | C | |
| YQ87040-002 (BS) YQ87040-002 | Chloroform | 78.0 | 79 - 124 | 79 - 124 | percent | J/UJ | C | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the LCS Recovery for SW8260D**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| TB08_0923-C YI30001-009 | TB | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| TB08_0923-C YI30001-009 | TB | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-02_0923 YI30001-001 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-02_0923 YI30001-001 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923 YI30001-002 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923 YI30001-002 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923-a YI30001-003 | FD | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923-a YI30001-003 | FD | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-11_0923 YI30001-010 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-11_0923 YI30001-010 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-12_0923 YI30001-004 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-12_0923 YI30001-004 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-36_0923 YI30001-006 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-36_0923 YI30001-006 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923 YI30001-011 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923 YI30001-011 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923-a YI30001-012 | FD | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |

**Qualified Results associated with the LCS Recovery for SW8260D**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| Z2-45_0923-a YI30001-012 | FD | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

**Quality Control Outliers for test method SW8260D, LCS RPD**

The objective of laboratory control sample/laboratory control sample duplicate (LCS/LCSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. LCS/LCSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Laboratory control sample/laboratory control sample duplicate RPD results that were outside of the acceptance criteria are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| YQ87138-003 (BD) YQ87138-003 | Acetone | 26.0 | < 20 | < 20 | rpd | J/None | Z | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW8260D, Surrogate**

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| Z2-11_0923 (N) YI30001-010 | 1,2-Dichloroethane-d4 | 119 | 81 - 118 | 10 - 118 | percent | J/None | I | |
| Z2-32_0923 (N) YI30001-005 | Toluene-d8 | 117 | 89 - 112 | 10 - 112 | percent | J/None | I | |
| Z2-45_0923 (N) YI30001-011 | 1,2-Dichloroethane-d4 | 120 | 81 - 118 | 10 - 118 | percent | J/None | I | |
| Z2-52R_0923 (N) YI30001-014 | 1,2-Dichloroethane-d4 | 119 | 81 - 118 | 10 - 118 | percent | J/None | I | |
| Z2-T3_0923 (N) YI30001-007 | Toluene-d8 | 117 | 89 - 112 | 10 - 112 | percent | J/None | I | |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

**Qualified Results associated with the Surrogate for SW8260D**

| FieldSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
|---|---|---|---|---|---|---|---|---|
| Z2-11_0923 YI30001-010 | N | cis-1,2-Dichloroethene | 1.00 | 0.790 | 0.790 J | | ug/l | I/TR/V2 |
| Z2-45_0923 YI30001-011 | N | trans-1,2-Dichloroethene | 1.00 | 0.810 | 0.810 J | + | ug/l | I/TR |
| Z2-45_0923 YI30001-011 | N | Vinyl chloride | 1.00 | 26.0 | 26.0 J | + | ug/l | I |
| Z2-T3_0923 YI30001-007 | N | Tetrachloroethene (PCE) | 1.00 | 0.470 | 0.470 J | + | ug/l | I/TR |
| Z2-T3_0923 YI30001-007 | N | Trichloroethene (TCE) | 1.00 | 0.600 | 0.600 J | + | ug/l | I/TR |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

**Table of All Qualified Results**

| Test Method: SW8260D | | Extraction Method: SW5030B | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID / LabSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| TB08_0923-C YI30001-009 | TB | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| TB08_0923-C YI30001-009 | TB | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| TB08_0923-C YI30001-009 | TB | cis-1,2-Dichloroethene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| TB08_0923-C YI30001-009 | TB | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-02_0923 YI30001-001 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-02_0923 YI30001-001 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-02_0923 YI30001-001 | N | cis-1,2-Dichloroethene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-02_0923 YI30001-001 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-04_0923 YI30001-002 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923 YI30001-002 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923 YI30001-002 | N | cis-1,2-Dichloroethene | 1.00 | 11.0 | 11.0 J | - | ug/l | V2 |
| Z2-04_0923 YI30001-002 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-04_0923-a YI30001-003 | FD | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923-a YI30001-003 | FD | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-04_0923-a YI30001-003 | FD | cis-1,2-Dichloroethene | 1.00 | 11.0 | 11.0 J | - | ug/l | V2 |
| Z2-04_0923-a YI30001-003 | FD | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-11_0923 YI30001-010 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-11_0923 YI30001-010 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-11_0923 YI30001-010 | N | cis-1,2-Dichloroethene | 1.00 | 0.790 | 0.790 J | | ug/l | I/TR/V2 |
| Z2-11_0923 YI30001-010 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-12_0923 YI30001-004 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-12_0923 YI30001-004 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-12_0923 YI30001-004 | N | cis-1,2-Dichloroethene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-12_0923 YI30001-004 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-36_0923 YI30001-006 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-36_0923 YI30001-006 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |

**Table of All Qualified Results**

| Test Method: SW8260D | | Extraction Method: SW5030B | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FieldSample ID / LabSample ID | Type | Analyte | LOQ | Lab Result | Qualified Result | Bias | Units | Reason |
| Z2-36_0923 YI30001-006 | N | cis-1,2-Dichloroethene | 1.00 | 1.50 | 1.50 J | - | ug/l | V2 |
| Z2-36_0923 YI30001-006 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-45_0923 YI30001-011 | N | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923 YI30001-011 | N | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923 YI30001-011 | N | cis-1,2-Dichloroethene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-45_0923 YI30001-011 | N | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-45_0923 YI30001-011 | N | trans-1,2-Dichloroethene | 1.00 | 0.810 | 0.810 J | + | ug/l | I/TR |
| Z2-45_0923 YI30001-011 | N | Vinyl chloride | 1.00 | 26.0 | 26.0 J | + | ug/l | I |
| Z2-45_0923-a YI30001-012 | FD | 1,1-Dichloroethane | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923-a YI30001-012 | FD | Chloroform | 1.00 | 0.800 | 0.800 UJ | | ug/l | C/V2 |
| Z2-45_0923-a YI30001-012 | FD | cis-1,2-Dichloroethene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-45_0923-a YI30001-012 | FD | Cyclohexane | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-50_0923 YI30001-013 | N | 1,2,4-Trichlorobenzene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-50_0923 YI30001-013 | N | Acetone | 20.0 | 10.0 | 10.0 UJ | | ug/l | V1/V2 |
| Z2-50_0923 YI30001-013 | N | Bromoform | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-52R_0923 YI30001-014 | N | 1,2,4-Trichlorobenzene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-52R_0923 YI30001-014 | N | Acetone | 20.0 | 10.0 | 10.0 UJ | | ug/l | V1/V2 |
| Z2-52R_0923 YI30001-014 | N | Bromoform | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-53_0923 YI30001-015 | N | 1,2,4-Trichlorobenzene | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-53_0923 YI30001-015 | N | Acetone | 20.0 | 10.0 | 10.0 UJ | | ug/l | V1/V2 |
| Z2-53_0923 YI30001-015 | N | Bromoform | 1.00 | 0.800 | 0.800 UJ | | ug/l | V2 |
| Z2-T3_0923 YI30001-007 | N | Tetrachloroethene (PCE) | 1.00 | 0.470 | 0.470 J | + | ug/l | I/TR |
| Z2-T3_0923 YI30001-007 | N | Trichloroethene (TCE) | 1.00 | 0.600 | 0.600 J | + | ug/l | I/TR |

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| C | LCS Recovery |
| I | Surrogate recovery outside project limits. |
| M | MS Recovery |
| TR | Trace Level Detect |
| V1 | ICV |
| V2 | CCV |
| Z | LCS RPD |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| J | Estimated Value |
| N | The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification. |
| NJ | The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| X | Result may require rejection; PDT attention required |

**Bias**

| | |
|---|---|
| - | The result may be biased low |
| + | The result may be biased high |

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

**Review Questions**

| Method: BNASIME (GC/MS-SIM Analysis by SW8270E) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Were there discrepancies between the COC and the samples received? | | • | | |
| Were there discrepancies between the COC and the sample labels? | | • | | |
| Were samples relinquished properly on the COC? | • | | | |
| Were all samples properly preserved? | • | | | |
| Were sampling dates/times, date and time of laboratory receipt of samples, and sample conditions upon receipt at the laboratory (including preservation, pH, and temperature) documented? | • | | | |
| Were sample results reported with percent moisture correction if required? | | | • | |
| Were analytical methods performed and analysis dates present? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Were QAPP specified Project Quantitation Limit Goals achieved? (The laboratory LOQ is compared to the QAPP Project Quantitation Goal) | | • | | Various compounds are reported with detections and non-detects at levels (LOQs) greater than the project PQGs; however, all raised PALs had detections associated. |
| Were holding times met? | • | | | |
| Were trip blanks analyzed at the proper frequency and in control? | | | • | |
| Were field blanks analyzed at the proper frequency and in control? | | | • | |
| Were equipment blanks analyzed at the proper frequency and in control? | | | • | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than DL? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | | • | | LCS only. |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | See QC outliers. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If ISM ws used for sample collection, were laboratory triplicates analyzed and within project acceptance limits? | | | • | |
| Were surrogate recoveries within project acceptance limits? | • | | | |
| Were field replicates (duplicates, triplicates, etc.) analyzed at the proper frequency and in control? | • | | | |
| Were reported sample concentrations within calibration range? | • | | | |
| Was the GC/MS system properly tuned based on method criteria? | • | | | |
| Was instrument tuning completed every 12 hours during sample analysis? | • | | | |
| Was the Calibration within project acceptance criteria? | • | | | |

**Review Questions**

Method: BNASIME (GC/MS-SIM Analysis by SW8270E)

| Review Questions | Yes | No | NA | Comment |
|---|---|---|---|---|
| Was a ICV performed after each ICAL prior to sample analysis and within project acceptance criteria? | • | | | |
| Were CCVs run at the required frequency and within project acceptance criteria? | • | | | |
| Were internal standard retention times and area criteria within project acceptance criteria? | • | | | |
| Were internal standards spiked for every sample, standard, and QC sample? | • | | | |
| Were instrument run logs present and filled out appropriately? | • | | | |
| Were sample preparation sheets present and filled out appropriately? | • | | | |
| Were certificates of standard traceability and documentation of standard solution preparation provided? | | • | | Lot numbers and expiration dates provided for standards/reagents, but no certificates for traceability provided. No further action. |
| Were recalculation of QC Elements and Sample Results performed? | • | | | |
| Were Relative Retention Times (RRTs) within ± 0.06 RRT units (may be updated based on daily CCV)? | • | | | |
| Were chromatograms checked for peak integration? (10% of automated integration and 100% of manual integrations) | • | | | |
| Were chromatograms checked for correct baseline/peak integration and possible interferences? | • | | | |
| Were qualitative ion mass present? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were DoD QSM corrective actions followed if deviations were noted? | | | • | |
| Were any data recommended for exclusion in the data validation process? | | • | | |

**Review Questions**

| Method: SW8081B (Organochlorine Pesticides by Capillary GC) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Were there discrepancies between the COC and the samples received? | | • | | |
| Were there discrepancies between the COC and the sample labels? | | • | | |
| Were samples relinquished properly on the COC? | • | | | |
| Were all samples properly preserved? | • | | | |
| Were sampling dates/times, date and time of laboratory receipt of samples, and sample conditions upon receipt at the laboratory (including preservation, pH, and temperature) documented? | • | | | |
| Were sample results reported with percent moisture correction if required? | | | • | |
| Were analytical methods performed and analysis dates present? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Were QAPP specified Project Quantitation Limit Goals achieved? (The laboratory LOQ is compared to the QAPP Project Quantitation Goal) | | • | | There were instances where compounds were reported with PQLs greater than project requirements; however, these had associated non-detections. |
| Were holding times met? | • | | | |
| Were trip blanks analyzed at the proper frequency and in control? | | | • | |
| Were field blanks analyzed at the proper frequency and in control? | | | • | |
| Were equipment blanks analyzed at the proper frequency and in control? | | | • | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than DL? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | | • | | LCS only. |
| Were LCS/LCSD recoveries within project acceptance limits? | | • | | See QC outliers. |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | • | | | |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If ISM ws used for sample collection, were laboratory triplicates analyzed and within project acceptance limits? | | | • | |
| Were surrogate recoveries within project acceptance limits? | • | | | |
| Were field replicates (duplicates, triplicates, etc.) analyzed at the proper frequency and in control? | • | | | |
| Were reported sample concentrations within calibration range? | • | | | |
| Were Instrument Performace Checks (Degradation Checks) performed and within acceptace criteria? | • | | | It was noted PEM was not conducted every 12 hours; however meets method requirements. No action taken on this basis. |
| Was the Calibration within project acceptance criteria? | • | | | |
| Was a ICV performed after each ICAL prior to sample analysis and within project acceptance criteria? | • | | | |

**Review Questions**

| Method: SW8081B (Organochlorine Pesticides by Capillary GC) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Were CCVs run at the required frequency and within project acceptance criteria? | • | | | |
| Were internal standard retention times and area criteria within method requirements? | | | • | |
| Were internal standards spiked for every sample, standard, and QC sample? | | | • | |
| Were instrument run logs present and filled out appropriately? | • | | | |
| Were sample preparation sheets present and filled out appropriately? | • | | | |
| Was a Cleanup Procedure required (Cleanup Recovery Checks) verified and within acceptance limits? | | | • | |
| Was a Second Column/Detector used and the column difference within acceptance limits? | • | | | All samples Non-detect. Column RPD confirm on QC samples. |
| Were certificates of standard traceability and documentation of standard solution preparation provided? | | • | | Lot numbers and expiration dates provided for standards/reagents, but no certificates for traceability provided. No further action. |
| Were recalculation of QC Elements and Sample Results performed? | • | | | |
| For internal standard calibration, were Relative Retention Times (RRTs) within ± 0.06 RRT units and updated with the latest daily CCV? | | | • | |
| Were chromatograms checked for peak integration when manually integrated? | • | | | |
| Were chromatograms checked for correct baseline/peak integration and possible interferences? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were DoD QSM corrective actions followed if deviations were noted? | | • | | LCS out of control high and samples not re-extracted/re-analyzed. All associated results were non-detect; therefore results were reported without bias following project guidelines. In addition, |
| Were any data recommended for exclusion in the data validation process? | | • | | |

**Review Questions**

Method: SW8260D (Volatile Organic Compounds by GC/MS)

| Review Questions | Yes | No | NA | Comment |
|---|---|---|---|---|
| Were there discrepancies between the COC and the samples received? | | • | | |
| Were there discrepancies between the COC and the sample labels? | | • | | |
| Were samples relinquished properly on the COC? | • | | | |
| Were all samples properly preserved? | • | | | |
| Were sampling dates/times, date and time of laboratory receipt of samples, and sample conditions upon receipt at the laboratory (including preservation, pH, and temperature) documented? | • | | | |
| Were sample results reported with percent moisture correction if required? | | | • | |
| Were analytical methods performed and analysis dates present? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Were QAPP specified Project Quantitation Limit Goals achieved? (The laboratory LOQ is compared to the QAPP Project Quantitation Goal) | | • | | There were instances where compounds were reported with PQLs greater than project requirements; however, these had both detections and non-detections associated. |
| Were holding times met? | • | | | |
| Were trip blanks analyzed at the proper frequency and in control? | • | | | |
| Were field blanks analyzed at the proper frequency and in control? | | | • | |
| Were equipment blanks analyzed at the proper frequency and in control? | | | • | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than DL? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | | • | | 2 of 5 batches were prepared with an LCS pair. The remaining batches were prepared with an LCS only. |
| Were LCS/LCSD recoveries within project acceptance limits? | | • | | See QC outliers. |
| Was the LCS/LCSD RPD within project acceptance limits? | | • | | See QC outliers. |
| Was a MS/MSD pair prepared with each batch? | | • | | No project-specific MS/MSD included in this method. |
| Were MS/MSD recoveries within project acceptance limits? | | | • | |
| Was the MS/MSD RPD within project acceptance limits? | | | • | |
| If ISM ws used for sample collection, were laboratory triplicates analyzed and within project acceptance limits? | | | • | |
| Were surrogate recoveries within project acceptance limits? | | • | | See QC outliers. |
| Were field replicates (duplicates, triplicates, etc.) analyzed at the proper frequency and in control? | • | | | |
| Were reported sample concentrations within calibration range? | • | | | |
| Was the GC/MS system properly tuned based on method criteria? | • | | | |
| Was instrument tuning completed every 12 hours during sample analysis? | • | | | |

**Review Questions**

| Method: SW8260D (Volatile Organic Compounds by GC/MS) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Was the Calibration within project acceptance criteria? | • | | | |
| Was a ICV performed after each ICAL prior to sample analysis and within project acceptance criteria? | | • | | See QC outliers. ICV form does not contain RF; therefore, not reviewed. In addition, 170928A13_ICV was biased high for Dichlorodifluoromethane. All associated results were non-detect. No action taken on this basis. |
| Were CCVs run at the required frequency and within project acceptance criteria? | | • | | See QC outliers. In addition, it was noted various analytes out of control both with high and low bias; however no results reported from analytical run. No action taken on this basis. |
| Were internal standard retention times and area criteria within project acceptance criteria? | • | | | |
| Were internal standards spiked for every sample, standard, and QC sample? | • | | | |
| Were instrument run logs present and filled out appropriately? | • | | | |
| Were sample preparation sheets present and filled out appropriately? | | | • | |
| Were certificates of standard traceability and documentation of standard solution preparation provided? | | • | | Lot numbers and expiration dates provided for standards/reagents, but no certificates for traceability provided. No further action. |
| Were recalculation of QC Elements and Sample Results performed? | • | | | |
| Were Relative Retention Times (RRTs) within ± 0.06 RRT units (may be updated based on daily CCV)? | • | | | |
| Were chromatograms checked for peak integration? (10% of automated integration and 100% of manual integrations) | • | | | |
| Were chromatograms checked for correct baseline/peak integration and possible interferences? | • | | | |
| Were qualitative ion mass present? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were DoD QSM corrective actions followed if deviations were noted? | | • | | CCV out of control and not all samples reanalyzed. All results were qualified according to DoD and project guidelines where non-conformities occurred. |
| Were any data recommended for exclusion in the data validation process? | | • | | |

**GC/MS VALIDATION WORKSHEET**
**INSTRUMENT PERFORMANCE CHECK**

| | | | |
|---|---|---|---|
| SDG #: | YI30001 | Date: | 4/9/2024 |
| Lab: | Pace | Page: | 1 of 1 |
| Client: | Bhate | Validated by: | JT |
| | | Second Review by: | KC |

**Method:** 8260

---

Tune ID: 170928A01.D
Recalculated Ion Ratio: 174:95
Reported Ratio: **88.6%** *p. 742*

Relative Abundance (Ion Ratio) = $\frac{\text{Response of Target Mass}}{\text{Response of Reference Mass}} \times 100$

Target Mass Response = 1470464 *p. 743*
Reference Mass Response = 1659904 *p. 743*

Relative Abundance = **88.6%** **Match**

Comments:

**GC/MS VALIDATION WORKSHEET**
**INITIAL CALIBRATION**

SDG #: YI30001
Lab: Pace
Client: Bhate

Date: 4/9/2024
Page: 1 of 1
Validated by: JT
Second Review by: KC

**Method:** 8260

---

RRF Standard ID (LVL 1): VSTD0.5EO
Compound ID: Chloromethane
Reported Result: **0.290870** *p. 290*

$$RRF = \frac{\text{Compound Area X I.S. Conc.}}{\text{I.S. Area X Compound Conc.}}$$

Compound Area = 3307 *p. 304*
I.S. Area = 1136935 *p. 305*
I.S. = Pentafluorobenzene
Compound Conc. = 0.5 *p. 304*
I.S. Conc. = 50.0 *p. 305*

RRF = **0.290870** **Match**

Calibration ID: ICAL msd17.i 28-Sep-2023
Compound ID: Vinyl chloride
%RSD: **8.8%** *p. 290*
Average RRF = **0.264063** *p. 290*

$$\%RSD = \frac{\text{Standard Deviation}}{\text{Average RRF}} X\ 100$$

| | | | |
|---|---|---|---|
| RF Level 1 = | 0.247420 | RF Level 6 = | 0.269513 |
| RF Level 2 = | 0.275119 | RF Level 7 = | 0.299724 |
| RF Level 3 = | 0.226462 | RF Level 8 = | |
| RF Level 4 = | 0.257994 | RF Level 9 = | |
| RF Level 5 = | 0.272209 | RF Level 10 = | |

Standard Deviation = 0.023
Average RRF = **0.264063** **Match**
%RSD = **8.8%** **Match**

**GC/MS VALIDATION WORKSHEET**
**INITIAL/CONTINUING CALIBRATION VERIFICATION**

| | | | |
|---|---|---|---|
| SDG #: | YI30001 | Date: | 4/9/2024 |
| Lab: | Pace | Page: | 1 of 1 |
| Client: | Bhate | Validated by: | JT |
| | | Second Review by: | KC |

**Method:** 8260

---

$$\% \text{ Recovery} = \frac{\text{Conc. ICV Found}}{\text{ICV Spike Conc.}} \times 100$$

ICV Standard ID: VICV050EO — Aqueous
Analyte ID: Dichlorodifluoromethane
Reported %Recovery: **123%** *pg 397*

Spike Conc.: 50 *pg 397*
Found Conc.: 61.63 *pg 397*

Calculated %Recovery = **123%** ***Match***

%D Standard ID: VSTD050JV
Compound ID: Chloromethane
Reported %D: **5.1%** *p. 591*

$$\%D = \frac{\text{Average RRF - CCV RRF}}{\text{Average RRF}} X\ 100$$

Average RRF = 0.274032 *p. 591*
CCV RRF = 0.288024 *p. 591*

%D = **5.1%** **Match**

Comments: ICV RRF was not reported by the lab.

**GC/MS VALIDATION WORKSHEET**
**SURROGATE SPIKES/SYSTEM MONITORING COMPOUNDS - WATER SAMPLES**

| | | | |
|---|---|---|---|
| SDG #: | YI30001 | Date: | 4/9/2024 |
| Lab: | Pace | Page: | 1 of 1 |
| Client: | Bhate | Validated by: | JT |
| | | Second Review by: | KC |

**Method:** 8260

---

Lab ID : Z2-04_0923 / YI30001-002
Compound ID: Toluene-d8
Reported Result: **103%** *p. 158*

% Recovery = Conc. Surr. In Sample X 100
Conc. Surr. Spiked

Conc. In Sample = 51.469 *p. 160*
Surr. Spike Conc. = 50.00 *p 301*

% Recovery = **103%** **Match**

Comments:

**GC/MS VALIDATION WORKSHEET**
**LABORATORY CONTROL SAMPLES**

SDG #: YI30001
Lab: Pace
Client: Bhate

Date: 4/9/2024
Page: 1 of 1
Validated by: JT
Second Review by: KC

**Method:** 8260

---

Sample ID: YQ87138-002
Compound ID: Benzene
Recovery: **102%** *p. 116*

$$\% \text{ Recovery} = \frac{\text{Conc. LCS}}{\text{LCS Spike Conc.}} \times 100$$

Conc. LCS = 51.0 *p. 116*
LCS Spike Conc. = 50.0 *p. 116*

% Recovery = **102%** **Match**

Sample ID: YQ87138-002 / YQ87138-003
Compound ID: Benzene
RPD: **1.6%** *p. 118*

$$\text{RPD} = \frac{|\text{LCS Conc.} - \text{LCSD Conc.}|}{(\text{LCS Conc.} + \text{LCSD Conc.})/2} \times 100$$

LCS Conc. = 51.0 *p. 116*
LCSD Conc. = 52.0 *p. 118*

RPD = **1.9%** **Match**

Comments: LCS only.

**GC/MS VALIDATION WORKSHEET**
**TARGET COMPOUND QUANTITATION**

| | | | |
|---|---|---|---|
| SDG #: | YI30001 | Date: | 4/9/2024 |
| Lab: | EMAX | Page: | 1 of 1 |
| Client: | Arcadis | Validated by: | JT |
| | | Second Review by: | KC |

**Method:** 8260

---

Sample ID: Z2-04_0923 / YI30001-002
Compound ID: cis-1,2-Dichloroethene
Reported Result (ug/L): **11** *p. 157*

Conc. In Sample = (Area Cmpd. In Sample / Area of I.S.) X (Conc. of I.S. / Average RRF) X (Final Volume / Initial Amount) X Dilution Factor

| | | Units | | |
|---|---|---|---|---|
| Area Sample = | 116135 | Area | *p. 159* | |
| Area I.S. = | 951621 | Area | *p. 159* | I.S = Pentafluorobenzene |
| Conc. I.S. = | 50.0 | ug/L | *p. 159* | |
| Average RRF = | 0.542882 | NA | *p. 409* | |
| Final Volume = | 5.00 | mL | *direct injection* | |
| Initial Amount = | 5.00 | mL | *direct injection* | |
| Dilution Factor = | 1.0 | NA | *p. 157* | |

Conc. In Sample = **11** **Match**

**S4VEM**
**INITIAL CALIBRATION**
**Pesticides - SW 8081B**

**SDG #:** **YI30001** **Date:** **09 Apr 24**
**Lab:** **Pace Analytical**
**Client:** **Bhate** **Validated by:** **JT**
**Matrix:** **Water** **Second Review by:** **KC**

## CALCULATIONS

$$\text{Calibration Factor (CF)} = \frac{\text{Instrument Response (Peak Height)}}{\text{Analyte Conc (ng)}}$$

$$\%\text{RSD} = \frac{\text{Standard Deviation}}{\text{Average CF}} \times 100\%$$

**ICAL of Multicomponent Analyte**

Calibration ID: ICAL gc7.i 31-Jul-2023
Calibration Date: 31-Jul-2023 14:01
Selected Peak : Peak #: 5
Analyte: Aldrin
Instrument / Column: gc7.i

| | ICAL Results for Column (1): | | ICAL Results for Column (2): | |
|---|---|---|---|---|
| Reported | Average CF: **96977727** | *p. 1082* | Average CF: **213815944** | *p. 1083* |
| Reported | %RSD: **14.4%** | *p. 1082* | %RSD: **14.7%** | *p. 1083* |

| | Conc (ng) | Peak Ht, | Reported CF | Calc'd CF | Conc (ng) | Peak Ht, | Reported CF | Calc'd CF |
|---|---|---|---|---|---|---|---|---|
| Level 1: | 0.005 | 389157 | **77831400** | **77831400** | 0.005 | 837901 | **167580200** | **167580200** |
| Level 2: | 0.01 | 1167145 | **116714500** | **116714500** | 0.01 | 2.55E+06 | **254808600** | **254808600** |
| Level 3: | 0.02 | 1974790 | **98739500** | **98739500** | 0.02 | 4.34E+06 | **217230400** | **217230400** |
| Level 4: | 0.05 | 4658614 | **93172280** | **93172280** | 0.05 | 1.03E+07 | **206391800** | **206391800** |
| Level 5: | 0.2 | 19686191 | **98430955** | **98430955** | 0.2 | 4.46E+07 | **223068720** | **223068720** |
| | *p. 1085* | *p. 1085* | *p. 1082* | ***Match*** | *p. 1086* | *p. 1086* | *p. 1083* | ***Match*** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Calculated | Avg CF (Peak #2) = | **96977727** | ***Match*** | Avg CF (Peak #2) = | **213815944** | ***Match*** |
| | Standard Deviation = | 13926765.5 | | Standard Deviation = | 31506079.4 | |
| Calculated | %RSD = | **14.4%** | ***Match*** | %RSD = | **14.7%** | ***Match*** |

**Comments:**

**S4VEM**
**INITIAL / CONTINUING CALIBRATION VERIFICATION**
**Pesticides - SW 8081B**

| | | | |
|---|---|---|---|
| **SDG #:** | **YI30001** | **Date:** | **09 Apr 24** |
| **Lab:** | **Pace Analytical** | | |
| **Client:** | **Bhate** | **Validated by:** | **JT** |
| **Matrix:** | **Water** | **Second Review by:** | **KC** |

## CALCULATIONS

%D = 100% × ( Found Conc - True Conc ) / True Conc

**ICV:** [a]

ICV ID: ICV SVGC-3607
Analyte: Dieldrin
Instrument / Column: gc7.i

Reported %D: **-9.4%** *p. 1173*

True Conc (Spike): 20.00 *p. 1173*
Found Conc: 18.123 *p. 1173*

Calculated %D = **-9.4%** ***Match***

---

**CCV:**

CCV ID: CCV SVGC-3610
Analyte: Dieldrin
Instrument / Column: gc7.i

Reported %D: **-27.2%** *p. 1185*

True Conc (Spike): 0.02 *p. 1188*
Found Conc: 0.02544 *p. 1188*

Calculated %D = **27.2%** ***Match***

**Comments:**

**S4VEM**
**SURROGATE SPIKES / SYSTEM MONITORING COMPOUNDS**
**Pesticides - SW 8081B**

| | | | |
|---|---|---|---|
| **SDG #:** | **YI30001** | **Date:** | **09 Apr 24** |
| **Lab:** | **Pace Analytical** | | |
| **Client:** | **Bhate** | **Validated by:** | **JT** |
| **Matrix:** | **Water** | **Second Review by:** | **KC** |

## CALCULATIONS

$$\%\text{Recovery} = \frac{\text{Conc Surr. In Sample}}{\text{Conc Surr. Spiked}} \times 100\%$$

Sample ID: Z2-02_0923 / YI30001-001
Analyte (Surrogate): Tetrachloro-m-xylene-D1

Reported %Recovery: **93.0%** *p. 1076*

Surr. Spike Conc: 0.1 *p 1077*
Reported Conc: 0.093 *p 1077*

Calculated %Recovery = **92.7%** ***Match***

**Comments:**

**S4VEM**
**LABORATORY CONTROL SAMPLE**
**Pesticides - SW 8081B**

| | | | |
|---|---|---|---|
| **SDG #:** | **YI30001** | **Date:** | **09 Apr 24** |
| **Lab:** | **Pace Analytical** | | |
| **Client:** | **Bhate** | **Validated by:** | **JT** |
| **Matrix:** | **Water** | **Second Review by:** | **KC** |

**CALCULATIONS**

**Verifying %Recovery:**

$$\%\text{Recovery} = \frac{\text{Conc LCS}}{\text{LCS Spike Conc}} \times 100\%$$

**No LCSD**

LCS Sample ID: YQ86402-002
Analyte: alpha-BHC

Reported %Recovery: **98%** *p. 1253*

LCS Spike Conc: 0.8 *p. 1253*
Conc LCS: 0.78755 *p1254*

Calculated %Recovery = **98%** ***Match***

**S4VEM**
**SAMPLE RESULT VERIFICATION**
**Pesticides - SW 8081B**

**SDG #:** **YI30001** **Date:** **09 Apr 24**
**Lab:** **Pace Analytical**
**Client:** **Bhate** **Validated by:** **JT**
**Matrix:** **Water** **Second Review by:** **KC**

## CALCULATIONS

**Sample Result** Sample Conc (µg/L) = $\frac{\text{Peak Height}}{\text{ICAL Avg. CF}} \times \frac{\text{Final Volume}}{\text{Initial Amount}} \times$ Dilution Factor

**ALL SAMPLE ND**

Sample ID:
Analyte:

Reported Sample Conc (µg/L): _____

Reported Raw Conc (µg/L): _____

Selected Column for Reported Result:
Calibration Average CF:
Height:
Final Volume (mL):
Initial Amount (mL):
Dilution Factor: 1

Calculated Raw Conc (µg/L) = **#DIV/0!**

Calculated Sample Conc (µg/L) = **#DIV/0!**

**S4VEM**
**INSTRUMENT PERFORMANCE CHECK**
**BNASIM**

**SDG #:** **YI30001** **Date:** **09 Apr 2024**
**Lab:** **Pace Analytical**
**Client:** **Bhate** **Validated by:** **JT**
**Matrix:** **Water** **Second Review by:** **KC**

## CALCULATIONS

Tune ID: 20101101.d
Recalculated Ion Ratio: 441:443

Reported Relative Abundance: **75.7%** *p. 871*

$$\text{Relative Abundance (Ion Ratio)} = \frac{\text{Response of Target Mass}}{\text{Response of Reference Mass}} \times 100\%$$

Target Mass Response (441): 98432 *p. 997*
Reference Mass Response (443): 130112 *p. 997*

Calculated Relative Abundance = **75.7%** ***Match***

**Comments:**

**S4VEM**
**INITIAL CALIBRATION**
**BNASIM**

**SDG #:** **YI30001** **Date:** **09 Apr 2024**
**Lab:** **Pace Analytical**
**Client:** **Bhate** **Validated by:** **JT**
**Matrix:** **Water** **Second Review by:** **KC**

## CALCULATIONS

**Verifying a single RRF result:**

$$RRF = \frac{\text{Analyte Resp.} \times \text{ISTD Conc.}}{\text{ISTD Resp.} \times \text{Analyte Conc.}}$$

RRF Standard ID: SSTD1.6WB
Calibration Level: LVL 5
Analyte: Naphthalene
ISTD: Naphthalene-d8

Reported — Calibration RRF: **1.136926** *p. 936*

Analyte Response: 215443 *p. 939*
ISTD Response: 47374 *p. 954*
Analyte Conc. (ng/uL): 1.6 *p. 939*
ISTD Conc. (ng/uL): 0.4 *p. 954*

Calculated — Calibration RRF = **1.136926** ***Match***

---

**Verifying Avg. RRF and %RSD:**

$$\%RSD = \frac{\text{Standard Deviation}}{\text{Average RRF}} \times 100\%$$

Analyte: Naphthalene

Reported — Average RRF: **1.141752** *p. 936*
Reported — %RSD: **2.4%** *p. 936*

| | RRF: | | RRF: |
|---|---|---|---|
| Lvl 1: | 1.154710 | Lvl 6: | |
| Lvl 2: | 1.172820 | Lvl 7: | |
| Lvl 3: | 1.145437 | Lvl 8: | |
| Lvl 4: | 1.098868 | Lvl 9: | |
| Lvl 5: | 1.136926 | Lvl 10: | |

Standard Deviation = 0.027

Calculated — Average RRF = **1.141752** ***Match***
Calculated — %RSD = **2.4%** ***Match***

**Comments:**

**S4VEM**
**INITIAL / CONTINUING CALIBRATION VERIFICATION**
**BNASIM**

**SDG #:** **YI30001** **Date:** **09 Apr 2024**
**Lab:** **Pace Analytical**
**Client:** **Bhate** **Validated by:** **JT**
**Matrix:** **Water** **Second Review by:** **KC**

## CALCULATIONS

%D = 100% × ( CV RRF - Avg RRF ) / Avg RRF

RRF = Analyte Resp. × ISTD Conc. / ISTD Resp. × Analyte Conc.

**ICV:**

ICV ID: ICV 20101109.d
Analyte: Naphthalene
ISTD: Naphthalene-d8

| | | | |
|---|---|---|---|
| Reported | ICV RRF: | **1.092028** | *p. 957* |
| Reported | %D: | **-4.4%** | *p. 957* |
| | Analyte Response: | 44617 | *p. 958* |
| | ISTD Response: | 40857 | *p. 958* |
| | Analyte Conc.: | 0.4 | *p. 958* |
| | ISTD Conc.: | 0.4 | *p. 958* |
| | Average RRF (ICAL): | 1.141752 | *p. 957* |
| Calculated | ICV RRF = | **1.092028** | ***Match*** |
| Calculated | %D = | **-4.4%** | ***Match*** |

---

**CCV:**

CCV ID: CCV 20101202.d
Analyte: Naphthalene
ISTD: Naphthalene-d8

| | | | |
|---|---|---|---|
| Reported | CCV RRF: | **1.099006** | *p. 968* |
| Reported | %D: | **-3.7%** | *p. 968* |
| | Analyte Response: | 51528 | *p. 969* |
| | ISTD Response: | 46886 | *p. 969* |
| | Analyte Conc.: | 0.4 | *p. 969* |
| | ISTD Conc.: | 0.4 | *p. 969* |
| | Average RRF (ICAL): | 1.141752 | *p. 968* |
| Calculated | CCV RRF = | **1.099006** | ***Match*** |
| Calculated | %D = | **-3.7%** | ***Match*** |

**Comments:**

**S4VEM**
**LABORATORY CONTROL SAMPLE**
**BNASIM**

| | | | |
|---|---|---|---|
| **SDG #:** | **YI30001** | **Date:** | **09 Apr 2024** |
| **Lab:** | **Pace Analytical** | | |
| **Client:** | **Bhate** | **Validated by:** | **JT** |
| **Matrix:** | **Water** | **Second Review by:** | **KC** |

## CALCULATIONS

**Verifying %Recovery:** %Recovery = $\frac{\text{Conc. LCS}}{\text{LCS Spike Conc.}} \times 100\%$

LCS Sample ID: YQ86383-002
Analyte: Pentachlorophenol

Reported %Recovery: **134%** *p. 867*

LCS Spike Conc.: 2.0 *p. 867*
Conc. LCS: 2.7 *p. 867*

Calculated %Recovery = **135%** ***Match***

**Comments:** LCS only.

**S4VEM**
**SURROGATE SPIKES / SYSTEM MONITORING COMPOUNDS**
**BNASIM**

**SDG #:** **YI30001** **Date:** **09 Apr 2024**
**Lab:** **Pace Analytical**
**Client:** **Bhate** **Validated by:** **JT**
**Matrix:** **Water** **Second Review by:** **KC**

## CALCULATIONS

$$\%\text{Recovery} = \frac{\text{Conc. Surr. In Sample}}{\text{Conc. Surr. Spiked}} \times 100\%$$

Sample ID: Z2-02_0923 / YI30001-001
Analyte (Surrogate): Fluoranthene-d10

Reported %Recovery: **92.0%** *p. 888*

Surr. Spike Conc.: 0.60 *p 939*
Reported Conc.: 0.53851 *p. 889*
Corrected for Dilution: 0.54928

Calculated %Recovery = **92%** ***Match***

**Comments:**

**S4VEM**
**SAMPLE RESULT VERIFICATION**
**BNASIM**

**SDG #:** YI30001 **Date:** 09 Apr 2024
**Lab:** Pace Analytical
**Client:** Bhate **Validated by:** JT
**Matrix:** Water **Second Review by:** KC

## CALCULATIONS

$$\text{Sample Conc. (µg/L)} = \frac{\text{Analyte Response}}{\text{ISTD Response}} \times \frac{\text{ISTD Conc.}}{\text{Average RRF}} \times \frac{\text{Final Volume}}{\text{Initial Amount}} \times \text{Dilution Factor}$$

Sample ID: MW-01-129_0923 / YI30001-017
Analyte: Naphthalene
ISTD: Naphthalene-d8

| | | | |
|---|---|---|---|
| Reported | Sample Conc. (µg/L): | 32 | *p. 927* |
| | Analyte Response: | 190237 | *p. 928* |
| | ISTD Response: | 67824 | *p. 928* |
| | ISTD Conc. (µg/L): | 0.4 | *p. 928* |
| | Average RRF (ICAL): | 1.141752 | *p. 936* |
| | Final Volume (mL): | 1 | *p. 928* |
| | Initial Amount (ml): | 620 | *p. 928* |
| | Dilution Factor: | 20 | *p. 928* |
| Calculated | Sample Conc. (µg/L): | 32 | ***Match*** |

Sample ID: MW-01-129_0923-a / YI30001-018
Analyte: Naphthalene
ISTD: Naphthalene-d8

| | | | |
|---|---|---|---|
| Reported | Sample Conc. (µg/L): | 30 | *p 931* |
| | Analyte Response: | 160885 | *p 932* |
| | ISTD Response: | 58878 | *p 932* |
| | ISTD Conc. (µg/L): | 0.4 | *p 932* |
| | Average RRF (ICAL): | 1.141752 | *p. 936* |
| | Final Volume (mL): | 1 | *p 932* |
| | Initial Amount (ml): | 630 | *p 932* |
| | Dilution Factor: | 20 | *p 932* |
| Calculated | Sample Conc. (µg/L): | 30 | ***Match*** |

**Comments:**

| | |
|---|---|
| Facility: | Joint Base Charleston Air, Long Term Monitoring |
| Event: | 2024 TU544 Replacement Well Sampling |
| SDG: | ZD22015 |
| Guidance Document: | CHRTN UFP-QAPP |
| Prime Contractor: | Bhate Environmental Associates, Inc., Birmingham, AL |
| Project Manager: | Frank Gardner |
| Contract Laboratory(ies): | Pace Analytical Services, LLC, West Columbia, SC |
| Data Review Contractor: | Synectics, Sacramento, CA |
| Data Review Level: | S2BVEM |
| Primary Data Reviewer: | Kathryn Cantone, Data Review Chemist |
| Second Reviewer: | Evin McKinney, Senior Scientist |
| Date Submitted: | May 15, 2024 |

| Field Sample ID | Lab Sample ID | Matrix | Type/Type Code | BNASIME | SW8260D |
|---|---|---|---|---|---|
| TU544_MW-1R-129_0424 | ZD22015-001 | Water | Field Sample/N | X | X |
| TU544_MW-1R-129_0424-a | ZD22015-002 | Water | Field Duplicate/FD | X | X |
| TU544_MW-1R-129_0424-C | ZD22015-003 | Water | Trip Blank/TB | | X |

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at S2BVEM data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the CHRTN UFP-QAPP and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Bhate Environmental Associates, Inc., Birmingham, AL; analyses were performed by Pace Analytical Services, LLC, West Columbia, SC and were reported under sample delivery group (SDG) ZD22015. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Field Duplicate RPD
- Lab Blank
- LCS Recovery
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time
- Trip Blank

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 0 results (0.00%) out of the 5 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Narrative Comments

| Analytical Method | Data Reviewer Comment |
|---|---|
| BNASIME | No additional comments; see Checklist for detail. |
| SW8260D | No additional comments; see Checklist for detail. |

May 14, 2024

Reviewed by Kathryn Cantone, Data Review Chemist, Synectics, Sacramento, CA

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.

Reviewed by Evin McKinney, Senior Scientist, Synectics, Sacramento, CA

May 15, 2024

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

**Quality Control Outliers for test method BNASIME, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| TU544_MW-1R-129_0424-MS (MS) ZD22015-001MS | Naphthalene | -50.0 | 43 - 114 | 10 - 114 | percent | J/UJ | M | Spike amount Insignificant |
| TU544_MW-1R-129_0424-MS (MS) ZD22015-001MS | Naphthalene | 0.00 | 43 - 114 | 10 - 114 | percent | J/UJ | M | Spike amount Insignificant |
| TU544_MW-1R-129_0424-MSD (SD) ZD22015-001MD | Naphthalene | 0.00 | 43 - 114 | 10 - 114 | percent | J/UJ | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

**Quality Control Outliers for test method SW8260D, MS Recovery**

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

| Sample ID/ Lab Sample ID | Analyte | Result | Warning Limits | Control Limits | Units | Qualifier | Reason Code | Comment |
|---|---|---|---|---|---|---|---|---|
| TU544_MW-1R-129_0424-MS (MS) ZD22015-001MS | Naphthalene | 50.0 | 61 - 128 | 10 - 128 | percent | J/UJ | M | Spike amount Insignificant |
| TU544_MW-1R-129_0424-MS (MS) ZD22015-001MS | Naphthalene | 60.0 | 61 - 128 | 10 - 128 | percent | J/UJ | M | Spike amount Insignificant |

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results.
Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Qualified Results

No results associated with this sample delivery group required qualification.

**Reason Code Definitions**

| Code | Definition |
|---|---|
| M | MS Recovery |

**Flag Code and Definitions**

| Flag | Definition |
|---|---|
| J | Estimated Value |
| N | The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification. |
| NJ | The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample. |
| R | The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making. |
| U | Undetected: The analyte was analyzed for, but not detected. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria. |
| X | Result may require rejection; PDT attention required |

**Bias**

| | |
|---|---|
| - | The result may be biased low |
| + | The result may be biased high |

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

**Review Questions**

Method: BNASIME (GC/MS-SIM Analysis by SW8270E)

| Review Questions | Yes | No | NA | Comment |
|---|---|---|---|---|
| Were there discrepancies between the COC and the samples received? | | • | | |
| Were there discrepancies between the COC and the sample labels? | | • | | |
| Were samples relinquished properly on the COC? | • | | | |
| Were all samples properly preserved? | • | | | |
| Were sampling dates/times, date and time of laboratory receipt of samples, and sample conditions upon receipt at the laboratory (including preservation, pH, and temperature) documented? | • | | | |
| Were sample results reported with percent moisture correction if required? | | | • | |
| Were analytical methods performed and analysis dates present? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Were QAPP specified Project Quantitation Limit Goals achieved? (The laboratory LOQ is compared to the QAPP Project Quantitation Goal) | | • | | Naphthalene was detected with a level (LOQ) greater than the project PQG due to dilution. Additionally, it was noted that LOQ was greater than project PALs |
| Were holding times met? | • | | | |
| Were trip blanks analyzed at the proper frequency and in control? | | | • | |
| Were field blanks analyzed at the proper frequency and in control? | | | • | |
| Were equipment blanks analyzed at the proper frequency and in control? | | | • | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than DL? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | | • | | LCS only. |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | |
| Was a MS/MSD pair prepared with each batch? | • | | | |
| Were MS/MSD recoveries within project acceptance limits? | | • | | See QC outliers. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If ISM ws used for sample collection, were laboratory triplicates analyzed and within project acceptance limits? | | | • | |
| Were surrogate recoveries within project acceptance limits? | • | | | |
| Were field replicates (duplicates, triplicates, etc.) analyzed at the proper frequency and in control? | • | | | |
| Were reported sample concentrations within calibration range? | • | | | |
| Was the GC/MS system properly tuned based on method criteria? | • | | | |
| Was instrument tuning completed every 12 hours during sample analysis? | • | | | |
| Was the Calibration within project acceptance criteria? | • | | | |

**Review Questions**

| Method: BNASIME (GC/MS-SIM Analysis by SW8270E) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Was a ICV performed after each ICAL prior to sample analysis and within project acceptance criteria? | • | | | |
| Were CCVs run at the required frequency and within project acceptance criteria? | • | | | |
| Were internal standard retention times and area criteria within project acceptance criteria? | • | | | |
| Were internal standards spiked for every sample, standard, and QC sample? | • | | | |
| Were instrument run logs present and filled out appropriately? | • | | | |
| Were sample preparation sheets present and filled out appropriately? | • | | | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were DoD QSM corrective actions followed if deviations were noted? | | | • | |
| Were any data recommended for exclusion in the data validation process? | | • | | |

**Review Questions**

Method: SW8260D (Volatile Organic Compounds by GC/MS)

| Review Questions | Yes | No | NA | Comment |
|---|---|---|---|---|
| Were there discrepancies between the COC and the samples received? | | • | | |
| Were there discrepancies between the COC and the sample labels? | | • | | |
| Were samples relinquished properly on the COC? | • | | | |
| Were all samples properly preserved? | • | | | |
| Were sampling dates/times, date and time of laboratory receipt of samples, and sample conditions upon receipt at the laboratory (including preservation, pH, and temperature) documented? | • | | | |
| Were sample results reported with percent moisture correction if required? | | | • | |
| Were analytical methods performed and analysis dates present? | • | | | |
| Were all requested target analytes reported? | • | | | |
| Were QAPP specified Project Quantitation Limit Goals achieved? (The laboratory LOQ is compared to the QAPP Project Quantitation Goal) | • | | | |
| Were holding times met? | • | | | |
| Were trip blanks analyzed at the proper frequency and in control? | • | | | |
| Were field blanks analyzed at the proper frequency and in control? | | | • | |
| Were equipment blanks analyzed at the proper frequency and in control? | | | • | |
| Was a method blank prepared and analyzed with each batch? | • | | | |
| Were target analytes in the method blank less than DL? | • | | | |
| Was an LCS/LCSD pair prepared and analyzed with each batch? | | • | | LCS only. |
| Were LCS/LCSD recoveries within project acceptance limits? | • | | | |
| Was the LCS/LCSD RPD within project acceptance limits? | | | • | |
| Was a MS/MSD pair prepared with each batch? | | • | | 1 of 2 batches prepared with a project-specific MS/MSD. |
| Were MS/MSD recoveries within project acceptance limits? | | • | | See QC outliers. |
| Was the MS/MSD RPD within project acceptance limits? | • | | | |
| If ISM ws used for sample collection, were laboratory triplicates analyzed and within project acceptance limits? | | | • | |
| Were surrogate recoveries within project acceptance limits? | | | • | |
| Were field replicates (duplicates, triplicates, etc.) analyzed at the proper frequency and in control? | • | | | |
| Were reported sample concentrations within calibration range? | • | | | |
| Was the GC/MS system properly tuned based on method criteria? | • | | | |
| Was instrument tuning completed every 12 hours during sample analysis? | • | | | |
| Was the Calibration within project acceptance criteria? | • | | | |

**Review Questions**

| Method: SW8260D (Volatile Organic Compounds by GC/MS) | | | | |
|---|---|---|---|---|
| Review Questions | Yes | No | NA | Comment |
| Was a ICV performed after each ICAL prior to sample analysis and within project acceptance criteria? | • | | | |
| Were CCVs run at the required frequency and within project acceptance criteria? | • | | | |
| Were internal standard retention times and area criteria within project acceptance criteria? | • | | | |
| Were internal standards spiked for every sample, standard, and QC sample? | • | | | |
| Were instrument run logs present and filled out appropriately? | • | | | |
| Were sample preparation sheets present and filled out appropriately? | | | • | |
| Have all Laboratory Case Narrative comments/findings been addressed in the data review process? | • | | | |
| Were DoD QSM corrective actions followed if deviations were noted? | | | • | |
| Were any data recommended for exclusion in the data validation process? | | • | | |

# Attachment 5

## Field Notes, Well Diagram, Well Installation, and Well Abandonment Forms

bhate

## WELL CONSTRUCTION DIAGRAM (Flush Mount)

| | | | |
|---|---|---|---|
| **SITE:** | JBCA | **WELL/BORING ID:** | MW-1R-129 |
| **PROJECT NAME:** | TU544 Well Replacement | **DRILLING METHOD:** | Hollow Stem Auger |
| **PROJECT NO.:** | SAS2300.1000.02.31AA | **DATE(S):** | 3/25/2024 |
| **DRILLING CONTRACTOR:** | Terry Environmental | **SURVEYOR:** | |
| **DRILLER:** | Randy Brand | **NORTHING (NAD 83):** | |
| **SCIENTIST:** | P. Bambach | **EASTING (NAD 83):** | |

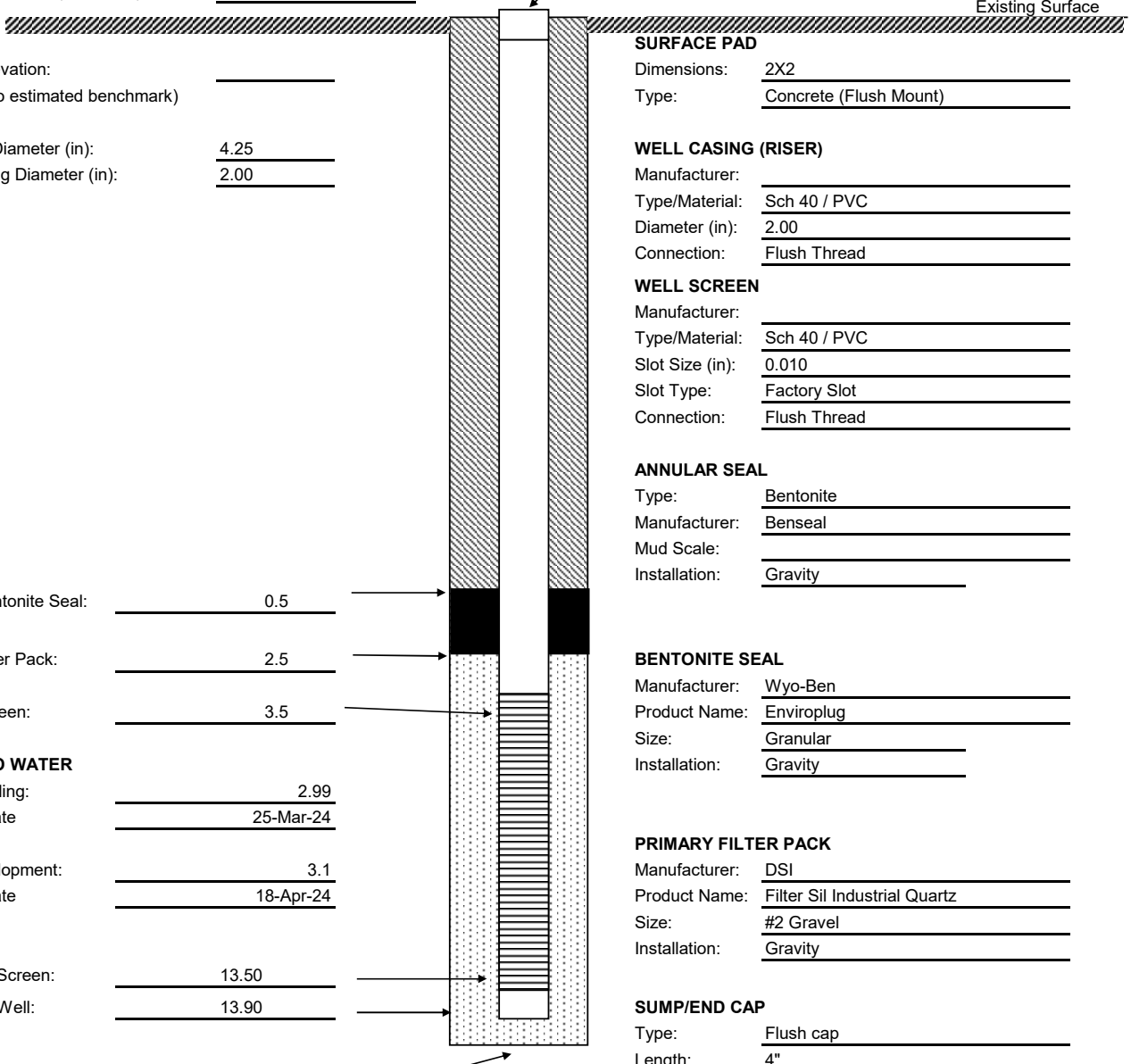
**NOT TO SCALE**

Surface Elevation (NGVD 29): NM

Casing Elevation: (Relative to estimated benchmark)

Borehole Diameter (in): 4.25

Well Casing Diameter (in): 2.00




Top of Bentonite Seal: 0.5

Top of Filter Pack: 2.5

Top of Screen: 3.5

**DEPTH TO WATER**

During Drilling: 2.99

Date: 25-Mar-24

Post Development: 3.1

Date: 18-Apr-24

Bottom of Screen: 13.50

Bottom of Well: 13.90

Borehole Depth: 17.0

**PROTECTIVE CASING**

Type: None

Dimensions: NA

Length: NA

**SURFACE PAD**

Dimensions: 2X2

Type: Concrete (Flush Mount)

**WELL CASING (RISER)**

Manufacturer:

Type/Material: Sch 40 / PVC

Diameter (in): 2.00

Connection: Flush Thread

**WELL SCREEN**

Manufacturer:

Type/Material: Sch 40 / PVC

Slot Size (in): 0.010

Slot Type: Factory Slot

Connection: Flush Thread

**ANNULAR SEAL**

Type: Bentonite

Manufacturer: Benseal

Mud Scale:

Installation: Gravity

**BENTONITE SEAL**

Manufacturer: Wyo-Ben

Product Name: Enviroplug

Size: Granular

Installation: Gravity

**PRIMARY FILTER PACK**

Manufacturer: DSI

Product Name: Filter Sil Industrial Quartz

Size: #2 Gravel

Installation: Gravity

**SUMP/END CAP**

Type: Flush cap

Length: 4"

**BACKFILL MATERIAL**

Type: Grout

Volume: To land surface

Comments: bgs = below ground surface; NA = not applicable, NM = not measured; PVC = polyvinyl chloride

# Water Well Record
## Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

*Note: Personal information provided on this document is subject to public scrutiny or release.*

**1. WELL OWNER INFORMATION:**
Name: RHINE ELIZABETH (BHATE ENV.) (last) (first)
Address: 1608 13TH AVE. SOUTH
City: BIRMNGHAM State: AL Zip: 35205-0000
Telephone: Work: (864) 982-9890 Home:

**2. LOCATION OF WELL:** SC **COUNTY:** CHARLESTON
Name: BUILDING 129 JBCA
Street Address: 103 SOUTH GRAVES AVE
City: NORTH CHARLESTON Zip: 29404-0000
Latitude: 32.896670 Longitude: -80.052358

**3. PUBLIC SYSTEM NAME:** **PUBLIC SYSTEM NUMBER:**
MW-1-129

**4. ABANDONMENT:** ☑ Yes ☐ No
Give Details Below
Grouted Depth: from 16.0 ft. to SURFACE ft.

| Formation Description | *Thickness of Stratum | Depth to Bottom of Stratum |
|---|---|---|
| | | |
| MONITORING WELL | | |
| ABANDONED. | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| *Indicate Water Bearing Zones (Use a 2nd sheet if needed) | | |
| **5. REMARKS:** | | |

**6. TYPE:** ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☑ Other

**7. PERMIT NUMBER:** UMW-29720 UST PERMIT # 16344

**8. USE:**
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☐ Test Well ☑ Monitor Well ☐ Replacement

**9. WELL DEPTH** (completed) Date Started: 3/25/2024
16.0 ft. Date Completed: 3/25/2024

**10. CASING:** ☐ Threaded ☐ Welded
Diam.: _____
Type: ☑ PVC ☐ Galvanized ☐ Steel ☐ Other
_____ in. to _____ ft. depth
_____ in. to _____ ft. depth
Height: Above/Below Surface _____ ft.
Weight _____ lb./ft.
Drive Shoe? ☐ Yes ☑ No

**11. SCREEN:**
Type: _____ Diam.: _____
Slot/Gauge: _____ Length: _____
Set Between: _____ ft. and _____ ft.
_____ ft. and _____ ft.
**NOTE: MULTIPLE SCREENS USE SECOND SHEET**
Sieve Analysis ☐ Yes (please enclose) ☑ No

**12. STATIC WATER LEVEL** _____ ft. below land surface after 24 hours

**13. PUMPING LEVEL** Below Land Surface.
_____ ft. after _____ hrs. Pumping _____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☑ No
Yield: _____

**14. WATER QUALITY**
Chemical Analysis ☑ Yes ☐ No Bacterial Analysis ☐ Yes ☑ No
Please enclose lab results.

**15. ARTIFICIAL FILTER** (filter pack) ☑ Yes ☐ No
Installed from _____ ft. to _____ ft.
Effective size _____ Uniformity Coefficient _____

**16. WELL GROUTED?** ☑ Yes ☐ No
☑ Neat Cement ☐ Bentonite ☐ Bentonite/Cement ☐ Other _____
Depth: From 16.0 ft. to SURFACE ft.

**17. NEAREST SOURCE OF POSSIBLE CONTAMINATION:** ____ ft. ____ direction
Type _____
Well Disinfected ☐ Yes ☑ No Type: _____ Amount: _____

**18. PUMP:** Date installed: _____ Not installed ☐
Mfr. Name: _____ Model No.: _____
H.P. _____ Volts _____ Length of drop pipe _____ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

**19. WELL DRILLER:** RANDY BRAND **CERT. NO.:** 1485
Address: (Print) Level: A B ✓ C D (circle one)
1511 Hidden Bridge Dr.
Mt. Pleasant, SC 29464
Telephone No.: 843-873-8200 Fax No.: 843-225-3472

**20. WATER WELL DRILLER'S CERTIFICATION:** This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: Randy Brand Well Driller Date: 3/27/2024

If D Level Driller, provide supervising driller's name:

DHEC 1903 (08/2017)

**COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER**

# Water Well Record
## Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

***Note:*** *Personal information provided on this document is subject to public scrutiny or release.*

**1. WELL OWNER INFORMATION:**
Name: BHATE ENVIRONMENTAL (last) (first)
Address: 1608 13TH AVE. SOUTH
City: BIRMNGHAM State: AL Zip: 35205-0000
Telephone: Work: (864) 982-9890 Home:

**2. LOCATION OF WELL:** SC **COUNTY:** CHARLESTON
Name: BUILDING 129 JBCA
Street Address: 103 SOUTH GRAVES AVE.
City: NORTH CHARLESTON Zip: 29404-0000
Latitude: 32.896669 Longitude: -80.052346

**3. PUBLIC SYSTEM NAME:** **PUBLIC SYSTEM NUMBER:**
MW-1R-129

**4. ABANDONMENT:** ☐ Yes ☑ No
Give Details Below
Grouted Depth: from _____ ft. to _____ ft.

| Formation Description | *Thickness of Stratum | Depth to Bottom of Stratum |
|---|---|---|
| | | |
| SEE GEOLOGIST LOG | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| *Indicate Water Bearing Zones (Use a 2nd sheet if needed) | | |

**5. REMARKS:**
BENTONITE SEAL:
3.0'-4.0'

**6. TYPE:** ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☑ Other

**7. PERMIT NUMBER:** UMW-29720 UST PERMIT # 16344

**8. USE:**
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☐ Test Well ☑ Monitor Well ☐ Replacement

**9. WELL DEPTH** (completed) 16.0 ft. Date Started: 3/25/2024 Date Completed: 3/25/2024

**10. CASING:** ☑ Threaded ☐ Welded
Diam.: 2.0"
Type: ☑ PVC ☐ Galvanized ☐ Steel ☐ Other
0.0 in. to 6.0 ft. depth
_____ in. to _____ ft. depth
Height: Above/Below Surface _____ ft.
Weight _____ lb./ft.
Drive Shoe? ☐ Yes ☑ No

**11. SCREEN:**
Type: SCH 40 PVC Diam.: 2.0"
Slot/Gauge: 0.010 Length: 10.0'
Set Between: 6.0 ft. and 16.0 ft.
_____ ft. and _____ ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☑ No

**12. STATIC WATER LEVEL** 2.9' ft. below land surface after 24 hours

**13. PUMPING LEVEL** Below Land Surface.
_____ ft. after _____ hrs. Pumping _____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☑ No
Yield: _____

**14. WATER QUALITY**
Chemical Analysis ☑ Yes ☐ No Bacterial Analysis ☐ Yes ☑ No
Please enclose lab results.

**15. ARTIFICIAL FILTER** (filter pack) ☑ Yes ☐ No
Installed from 4.0 ft. to 6.0 ft.
Effective size 2 Uniformity Coefficient _____

**16. WELL GROUTED?** ☑ Yes ☐ No
☑ Neat Cement ☐ Bentonite ☐ Bentonite/Cement ☐ Other _____
Depth: From 3.0 ft. to SURFACE ft.

**17. NEAREST SOURCE OF POSSIBLE CONTAMINATION:** ____ ft. ____ direction
Type _____
Well Disinfected ☐ Yes ☑ No Type: _____ Amount: _____

**18. PUMP:** Date installed: _____ Not installed ☐
Mfr. Name: _____ Model No.: _____
H.P._____ Volts_____ Length of drop pipe_____ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

**19. WELL DRILLER:** RANDY BRAND **CERT. NO.:** 1485
Address: (Print) Level: A B C D (circle one)
1511 Hidden Bridge Dr.
Mt. Pleasant, SC 29464
Telephone No.: 843-873-8200 Fax No.: 843-225-3472

**20. WATER WELL DRILLER'S CERTIFICATION:** This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: Randy Brand Well Driller Date: 3/27/2024

If D Level Driller, provide supervising driller's name:



**COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER**

Weather: 55 Cloudy

JBCA TH-544 Well Replacement 11:00
Abandon MW-1-129 and install
new well to MW-1R-129.
11:05 HAS Meeting. Discuss utility
nearby will installation
Rudy Brand, Connor from Terry
Environmental
11:10 Begin drilling 4.25" auger
using Geoprobe 7822DT
11:40 Drill to depth
11:45 Install 0.01 slotted
screen from 6-16' ft. with
cap. Filter pack #2 gravel.
install from 16 to 4 ft bls.
12:20 Bentonite chips installed
from 4' to 2' bls. Added water
to activate

12:30 Break for lunch
13:00 Back from lunch
13:10 Pull 4 inch well
casing in original well
13:30 Backfill with cement
13:40 Begin breaking old
concrete pad.
13:55 Removed old 3x3,5"
Concrete pads
14:05 Top soil laid down
in location of old vault.
14:20 High strength concrete
mix used for grouting new
well to surface
14:30 Begin mixing grout for
new pad.

14:40 - Water level at 2.99 bls
15:00 - Laura comes by to document progress.
15:30 Discussion about overdrilling
16:00 It is decided that drillers will return tomorrow with the proper size drill. 6.5" inches to overdrill and remove contaminant.
16:30 cleaning up site
17:00 Drop off IDW (1 Drum)
17:10 offsite, Drillers and P. Bambach

Weather: 60° Partly cloudy
3/26/24 JBCA-TH-544
07:00 P. Bambach on site
08:00 Terry Environmental (Randy and Connor) on-site
08:25 Health and safety meeting with Terry Environmental
Discussed hand augering to depth below utility depth (4ft), even though no active lines are in the area.
Goal today is to remove sand pack sand that is present around old well MW-1-129
09:05 Begin drilling with 6.25 augers
09:40 Advance Hollow stem auger to 16 ft bls

09:50 Advanced to 18' ft bsl removed gray, silty, muddy sand with strong petro odor (5-10') ft Nate

10:40 Augers are completely removed from overdrilling hole

10:45 Drillers begin filling in hole with cement

11:00 1.25 additional drums of IDW. Total of 2.25 drums used for well abandonment.

11:25 Hole filled to 2' bls with cement

11:40 IDW carried by drill rig to trailer

12:10 10 Bags of grout to backfill hole

12:20 Remaining 2' ft backfilled with top soil to surface

12:25 Rwt marks from rig filled with top soil and seed.

12:30 Cones pwt on top of grout filled hole so no one steps on it while it is settling.

13:05 Drillers and P. Barnhardt offsite

13:40 IDW dropped at storage area (2.25 drums) - total

13:45 offsite

# Attachment 6

## Soil Gas Sampling and Summa Cannister Operation SOPs

| Region 4<br>U.S. Environmental Protection Agency<br>Laboratory Services & Applied Science Division<br>Athens, Georgia | |
|---|---|
| Operating Procedure | |
| Title: Soil Gas Sampling | ID: LSASDPROC-307-R5 |
| Issuing Authority: Field Services Branch Supervisor | |
| Effective Date: April 22, 2023 | Review Due Date: February 06, 2024 |
| Method Reference: N/A | SOP Author: Landon Pruitt |

**Purpose**

This document describes general and specific procedures, methods and considerations to be used and observed when collecting soil gas samples for field screening or laboratory analysis.

**Scope/Application**

The procedures contained in this document are to be used by field personnel when collecting and handling soil gas samples in the field. On the occasion that LSASD field personnel determine that any of the procedures described in this section are inappropriate, inadequate or impractical and that another procedure must be used to obtain a soil gas sample, the variant procedure will be documented in the field log book, along with a description of the circumstances requiring its use. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

# TABLE OF CONTENTS

1 General Information ..... 3
1.1 Documentation/Verification ..... 3
1.2 General Precautions ..... 3
2.2 Special Precautions for Soil Gas Sampling ..... 4
2.4 Quality Control ..... 5
2.5 Records ..... 5
3 Geoprobe® PRT System Installation ..... 5
3.1 General ..... 6
3.2 PRT System Installation Procedures ..... 6
3.3 Decommissioning PRT Sample Locations ..... 8
4 Geoprobe® Permanent Soil Gas Implant Installation ..... 8
4.1 General ..... 8
5 Sub-Slab Soil Gas Sampling Port Installations ..... 11
5.1 General ..... 11
5.2 Installation of Temporary Sub-slab Soil Gas Sampling Ports ..... 11
5.3 Installation of Permanent Sub-slab Soil Gas Sampling Ports ..... 12
6 Helium Leak Testing of PRT Soil Gas Sampling Installations ..... 12
6.1 General ..... 12
6.2 Helium Leak Testing Procedures for PRT Soil Gas Sampling Installations ..... 12
6.3 Helium Leak Testing Procedures for Sub-slab Soil Gas Sample Ports ..... 13
7 Sampling Soil Gas Installations ..... 13
8 References ..... 15
9 Revision History ..... 17

# 1 General Information

## 1.1 Documentation/Verification

This procedure was prepared by persons deemed technically competent by LSASD management, based on their knowledge, skills and abilities and has been tested in practice and reviewed in print by a subject matter expert. The official copy of this procedure resides on the LSASD Local Area Network (LAN). The Document Control Coordinator (DCC) is responsible for ensuring the most recent version of the procedure is placed on LAN and for maintaining records of review conducted prior to its issuance.

## 1.2 General Precautions

### 1.2.1 Safety

Proper safety precautions must be observed when collecting soil gas samples. Refer to the LSASD Safety, Health and Environmental Management Program (SHEMP) Procedures and Policy Manual and any pertinent site-specific Health and Safety Plans (HASP) for guidelines on safety precautions. These guidelines should be used to complement the judgment of an experienced professional. Address chemicals that pose specific toxicity or safety concerns and follow any other relevant requirements, as appropriate.

### 1.2.2 Procedural Precautions

The following precautions should be considered when collecting soil gas samples.

**1.2.2.1** Special care must be taken not to contaminate samples. This includes storing samples in a secure location to preclude conditions which could alter the properties of the sample.

**1.2.2.2** Samples shall be custody sealed during long-term storage or shipment.

**1.2.2.3** Custody seals should not be placed on the canisters due to VOCs that may out-gas from the adhesives. Custody seals should be placed on the outside of canister shipping containers.

**1.2.2.4** Sample identification tags shall be attached to the canister using wire, cable tie, or string. Adhesive labels should be affixed to the tag and not be placed directly on the canister.

**1.2.2.5** Collected samples are in the custody of the sampler or sample custodian until the samples are relinquished to another party.

**1.2.2.6** If samples are transported by the sampler, they will remain under his/her custody or be secured until they are relinquished.

**1.2.2.7** Shipped samples shall conform to all U.S. Department of

Transportation (DOT) and/or International Air Transportation Association (IATA) hazardous materials shipping requirements.

**1.2.2.8** Documentation of field sampling is done in a bound logbook.

**1.2.2.9** Chain-of-custody (COC) documents shall be filled out and remain with the samples until custody is relinquished.

**1.2.2.10** Canister Sample Identification Tags and COC and Field Logbook should list the unique canister serial number and the starting time that the sample was collected.

**1.2.2.11** All shipping documents, such as air bills, bills of lading etc., shall be retained by the project leader and stored in a secure place.

# 2.0 Special Sampling Considerations

## 2.1 Special Considerations for Sampling

The tubing used as part of either of the described sampling systems should be Teflon® or stainless steel. As most current soil gas sampling will be conducted to investigate the presence or extent of organic compounds (not including PFAS compounds), Teflon® tubing is required to ensure the integrity of the sample.

Extreme care should be taken to protect all VOC sampling equipment whose surfaces will come in direct contact with the collection of the sample. For instance, a Geoprobe® or other drilling rig should not be used to carry or transport sampling equipment because of diesel and other VOC emissions. In addition, other field support vehicles should not be operated in the proximity of the sampling site shortly before or during sampling.

## 2.2 Special Precautions for Soil Gas Sampling

**2.2.1** A clean pair of new, non-powdered, disposable gloves (gloves) will be worn each time a different location is sampled, and the gloves should be donned immediately prior to sampling. The gloves should be changed any time during sample collection when their cleanliness is compromised.

**2.2.2** If possible, one member of the field sampling team should take all the notes and photographs fill out tags, etc., while the other member(s) collect the samples.

**2.2.3** Using O-rings on all PRT tooling, adapters, and probe rods will ensure that the entire sampling train is air-tight. This will prevent soil ingress during installation and to maintain sample integrity by ensuring that no ambient air is introduced into the sample during collection.

### 2.3 Sample Handling Requirements

**2.3.1** Soil gas samples will typically be collected by directly filling an evacuated, 6-liter passivated stainless-steel canister after sample delivery line purging.

**2.3.2** The canister will be labeled and identified according to LSASD Operating Procedure for Packaging, Marking, Labeling and Shipping of Environmental and Waste Samples (LSASDPROC-209).

### 2.4 Quality Control

Quality control sampling for soil gas sampling investigations will consist of collection of the following types of samples, as appropriate.

**2.4.1** Control Sample: If applicable to the study or investigation, a control (or background) sample should be collected from a location not affected by the possible contaminants of concern and submitted with the other samples.

**2.4.2** Trip Blank: A canister trip blank, prepared prior to the investigation by LSB personnel, should follow alongside the traditional samples and be submitted with the sample set during the investigation.

**2.4.3** Equipment rinsate blank: Equipment rinsate blanks should be collected if equipment, such as PRT adapters, probe rods, or other sampling equipment is field cleaned and re-used in the sample train to document that low-level contaminants were not introduced into the sample by the decontaminated equipment.

**2.4.4** Field Split: Field split samples, at a minimum frequency of one for every ten samples should be collected. Split samples are collected from one single sample port or installation by attaching the center leg of a Swagelok® "Tee" to the end of the sample tubing. The remaining legs of the "Tee" are connected to two sample containers (usually two flow controllers with roughly the same calibrated flow) which are opened and filled simultaneously.

### 2.5 Records

Information generated or obtained by LSASD personnel will be organized and accounted for in accordance with LSASD records management procedures found in the LSASD Operating Procedure for Control of Records (LSASDPROC-002). Field notes, recorded in a bound field logbook, will be generated, as well as chain-of-custody documentation according to the procedures found in LSASD Operating Procedure Logbooks (LSASDPROC-010) and LSASD Operating Procedure for Sample and Evidence Management (LSASDPROC-005).

## 3 Geoprobe® PRT System Installation

## 3.1 General

Single event or grab sampling may be conducted using the Post-Run Tubing System (PRT). Using this system, soil gas samples can be collected quickly and with a high degree of assurance that the samples are representative of the targeted depth.

The downhole components of the PRT system include:

**3.1.1** Sample delivery tubing
**3.1.2** Probe rods
**3.1.3** PRT Adapter
**3.1.4** Expendable point holder
**3.1.5** Expendable point

O-ring seals are used on the PRT Adapter and the expendable point holder. O-rings can also be used at all rod joints, preventing soil ingress which can prevent air-tight docking of the PRT adapter.

## 3.2 PRT System Installation Procedures

The following procedures are used to collect soil gas samples using the Geoprobe® PRT system. The PRT system is available for 1.0-inch, 1.25-inch and 1.5-inch diameter probe rods. In LSASD practice, 1.25-inch rods are used. All parts or accessories used in the PRT system must be selected with the appropriate diameter probe rod in mind to ensure compatibility of all components.

**3.2.1** Ensure that the sampling location has been cleared using the procedures detailed in the Site Safety Plan. The plan should stipulate that: prior to site arrival the proposed soil gas sampling locations will be cleared using the One Call utility locating service. Upon arrival at the site each individual soil gas sampling location will be cleared using a pipe scanner and metal locater.

**3.2.2** Cut a 4-foot by 4-foot section of disposable plastic sheeting and place on the ground next to the sampling location.

**3.2.3** Hand auger a 4-foot deep hole using a clean stainless-steel hand auger emptying the soil cuttings on the plastic sheeting.

**3.2.4** Don a clean set of gloves. To ensure there is no thread damage to the internal threads of the expendable point holder or the PRT adapter, hand screw the PRT adapter counter-clockwise into the expendable point holder using only your fingertips. The two components should screw together smoothly. If they do not replace them and repeat the test. Note: PRT fittings are left-hand threaded; turn counterclockwise to tighten.

**3.2.5** Place O-ring on PRT expendable point holder and attach to initial section of probe rod.

**3.2.6** Place O-ring on expendable point and press into expendable point holder.

**3.2.7** Add drive cap to probe rod and push PRT system through the augured hole into ground to the bottom of the sampling interval. Take special care to assure that the rods are in line with the push axis of the probe machine.

**3.2.8** It is important to leave at least a 2-foot interval of undisturbed native soil between the augured hole and the top of the sampling interval. The native soil layer will be used to support the bentonite/soil layers described in Step 11.

**3.2.9** At the bottom of the desired sampling depth, attach a point popper to an extension rod and insert extension rod string into rods so that the point popper rests on the expendable point. Using the rod puller and taking special care to maintain probe alignment with the rods, begin pulling the rods while maintaining pressure on the extension rods. The extension rods should drop when the pull is started, indicating that the expendable point has been ejected. The rods can then be pulled to expose the desired open sampling interval.

**3.2.10** Using a properly decontaminated water level sounder, check, if conditions warrant, to make sure groundwater is not present at the bottom of the rod string. If groundwater is present, the sampling location should be properly abandoned, and an alternate sampling location determined. Soil gas samples should never be collected if there is a high possibility that groundwater may enter the sampling equipment. The groundwater will ruin the sampling and analysis equipment and invalidate the soil gas sample.

**3.2.11** The drive rods that are contained in the augured hole will be "sealed" by first adding 12 inches of bentonite clay crumbles (not pellets) and hydrating with de-ionized water. Second, the augured hole will be filled with alternating layers of soil cuttings and hydrated bentonite clay crumbles while being hand packed with a clean stainless-steel auger handle or similar device.

**3.2.12** Secure the PRT adapter to a length of Teflon® tubing sufficient to reach from the sampling interval to the surface, with several feet of excess tubing extending beyond the top of the probe rod to facilitate sampling. Straighten the first two feet of tubing above the adapter by pulling it between your thumb and forefinger. This will ease the docking of the tubing.

**3.2.13** Run the tubing and adapter into the probe rod and, using steady downward pressure turn the tubing counter-clockwise to dock the adapter into the top of the expendable point holder. Tug gently on the tubing to ensure that the adapter engaged with the expendable point holder. Continue rotating the tubing until the adapter is firmly seated. Failure to dock could indicate that soil intruded during the push or that the expendable point was lost during the push.

**3.2.14** At this point, the PRT system has been installed and is ready to be helium leak tested (Section 6) before sampling. If the sample cannot be collected immediately, the end of the tubing should be capped with a stainless-steel Swagelok® cap or crimped by bending over and securing with a cable tie. Sampling is conducted using one of the

procedures described in Section 7.

### 3.3 Decommissioning PRT Sample Locations

Because it is impractical to pump grout through the PRT adapter on the lead probe rod, the entire string of rod must be removed before decommissioning can commence. The following methods are available, depending on conditions related to sample depth and post-removal probe hole wall stability:

**3.3.1 Direct Placement of Pellets or Grout** - If the sampling depth was relatively shallow, on the order of ten feet or less, or the bore hole did not penetrate a water table, grouting/sealing the open hole can be accomplished by directly placing bentonite pellets, hydrated in lifts or pouring a 30% solids bentonite grout mixture from the surface. The acceptable maximum depth for this option is somewhat dependent on the stability of the hole and these methods may be used at slightly greater depths if the holes do not collapse after removal of the rod.

**3.3.2 Re-entry Grouting** - For locations where sampling was conducted at somewhat greater depths, where groundwater was penetrated, or where the surficial formations tend to collapse, the only viable option for grout placement may be to re-probe the entire depth with a new expendable point. After reaching the original sample depth, the expendable point is ejected and the hole is grouted by directly injecting grout through the inside of the rod string, as it is removed. Use of this option is dependent on the relative degree of hole stability.

## 4 Geoprobe® Permanent Soil Gas Implant Installation

### 4.1 General

Long-term soil gas sampling may be conducted using permanent soil gas sampling implants installed with the Geoprobe®. Stainless steel implants may be installed at any depth achievable by the Geoprobe® and may be installed using various diameters of probe rod. In LSASD practice, 2.25-inch probe rods are used. The implants may be installed in custom lengths, configured using a wide assortment of available implant lengths and connections. The implant screens are double-woven stainless steel mesh with 0.0057-inch (0.15 mm) pore openings.

Permanent soil gas sampling implants may also be installed using 2.125-inch diameter rods utilizing an advancing thin-walled corer to facilitate placement of the implant (see Geoprobe Systems, Direct Push Installation of Devices for Active Soil Gas Sampling & Monitoring, Technical Bulletin No. MK3098 for details of this application).

### 4.2 Installation of Permanent Soil Gas Sampling Implants (Typical)

The following procedures are used by LSASD to install a permanent soil gas sampling implant using the Geoprobe®. These are the general procedures which are used with 2.25-inch diameter probe rod.

**4.2.1** Ensure that the sampling location has been cleared using the procedures detailed in the Site Safety Plan. The plan should stipulate that: prior to site arrival

the proposed soil gas sampling locations will be cleared using the One Call utility locating service. Upon arrival at the site each individual soil gas sampling location will be cleared using a pipe scanner and metal locater.

**4.2.2** Cut a 4-foot by 4-foot section of disposable plastic sheeting and place on the ground next to the sampling location.

**4.2.3** Hand auger a 4-foot deep hole using a clean stainless-steel hand auger emptying the soil cuttings on the plastic sheeting.

**4.2.4** Don a clean set of gloves. To ensure there is no thread damage to the internal threads of the expendable implant anchor or the implant, hand screw the implant counter-clockwise into the expendable implant anchor using only your fingertips. The two components should screw together smoothly. If they do not replace them and repeat the test. Note: implant fittings are left-hand threaded; turn counterclockwise to tighten.

**4.2.5** Place o-ring on PRT expendable implant anchor and attach to initial section of probe rod.

**4.2.6** Add drive cap to probe rod and push PRT system through the augured hole into ground to the bottom of the sampling interval. Take special care to assure that the rods are in line with the push axis of the probe machine. Do not retract rod or removed expendable point yet.

**4.2.7** Using a properly decontaminated water level sounder, check, if conditions warrant, to make sure groundwater is not present at the bottom of the rod string. If groundwater is present, the sampling location should be properly abandoned, and an alternate sampling location determined. Soil gas samples should never be collected if there is a high possibility that groundwater may enter the sampling equipment. The groundwater will ruin the sampling and analysis equipment and invalidate the soil gas sample.

**4.2.8** Install an o-ring on the docking end of the implant. Next, secure the implant to a length of 1/4“Teflon® tubing sufficient to reach from the sampling interval to the surface, with several feet of excess tubing extending beyond the top of the probe rod to facilitate sampling. Use electrical tape or a cable tie to temporarily cap the end of the tubing. Straighten the first two feet of tubing above the adapter by pulling it between your thumb and forefinger. This will ease the docking of the tubing.

**4.2.9** Run the tubing and implant into the probe rod and, using steady downward pressure turn the tubing counter-clockwise to dock the adapter into the top of the expendable point holder. Tug gently on the tubing to ensure that the adapter engaged with the expendable point holder. Continue rotating tubing until the adapter is firmly seated. If docking is difficult, try running the implant and tubing thru an appropriate length of 1/2” PVC tremie pipe to better align the implant with the expendable point to facilitate docking. Remove the tremie pipe once docking is achieved. Failure to dock could indicate that soil intruded during the push or that the expendable point was lost

during the push. If the implant does not dock, it is possible to salvage the installation by removing the implant and sealing the small hole on the bottom of the implant, if present, with foil or with a small sheet metal screw, then returning the implant to the hole.

**4.2.10** After the implant has been docked, use a pull cap and pull the probe rod approximately one foot while applying slight downward pressure on the tubing connected to the implant. This should start to expose the implant in the sampling interval. Take care while moving the rod and observe the tubing to make sure that the anchor and implant remained in place and is not being pulled with the rod.

**4.2.11** If the implant remained in place, slowly pour a measured amount of 60-100 mesh glass beads down the inside of the probe rod. The glass beads are used as a filter pack around the implant. The implant should be covered with beads to approximately six inches above the top of the implant. The volume of beads should be calculated based on the length of implant used, alternatively, a water level sounder can be used to measure the top of the bead layer. While pouring the beads, it is advisable to gently shake the tubing to prevent the beads from bridging inside the probe rod.

**4.2.12** After placing the beads, the implant is sealed using a flowable mixture of the glass beads and fine-powdered bentonite. To accomplish this, at least 6 inches of rod is pulled, and the mixture is slowly poured into the rod above the bead-packed implant. As with the bead placement, similar care should be taken to avoid bridging of this mixture.

**4.2.13** After placement of the seal, the rod string is removed, and the resultant annular space is grouted using the following procedures which are dependent on the depth and stability of the open hole.

**4.2.14** If the resultant open hole is shallow (ten feet or less) and the hole walls are stable, the hole may either be filled with bentonite pellets, hydrated in lifts or grouted using a 30% solids bentonite grout, poured from the surface.

**4.2.15** If the hole is deeper than ten to fifteen feet, better results may be obtained by using a tremie pipe to place a pumpable grout. One half inch PVC tremie pipe or Geoprobe nylon grout tubing is threaded down the annulus to the top of the bead/bentonite seal. The tremie is pulled off the bottom to prevent jetting out the seal and grout is pumped until the annulus is filled. Procedures are similar to those for well annular seals described in LSASDGUID-101, Section 2.3.5.

**4.2.16** For permanent or long-term installations, the tubing should be protected by an appropriate surface completion, such as a flush vault or well protective casing, similar to well protective casings, as described in LSASDGUID-101. After the installation of the vault, cut off the end of the tubing with the previously installed electrical tape or cable tie and cap with a stainless-steel capping fitting.

**4.2.17** After installation is complete the soil gas implant is sampled using one of the methods described in Section 7.

**4.2.18** Helium leak testing is not practical nor required for permanent soil gas installations.

# 5 Sub-Slab Soil Gas Sampling Port Installations

## 5.1 General

For soil gas samples that need to be collected under a current structure, sub-slab soil gas ports should be installed. Temporary or long-term installations may be installed depending on the project needs. Stainless steel screens may be installed if loose or unconsolidated soils lie underneath the slab. Extreme care should be taken in the location of the drilled sample ports.

## 5.2 Installation of Temporary Sub-slab Soil Gas Sampling Ports

The following procedures are used to install a temporary sub-slab soil gas sampling port.

**5.2.1** Ensure that the sampling location has been cleared using the procedures detailed in the Site Safety Plan. As most if not all of these applications will be inside, a One Call utility locating service might not help. Upon arrival at the site, each individual sub-slab sampling location should be cleared verbally and visually with a site engineer or home owner, whoever is available with the most knowledge on the structure.

**5.2.2** Don a clean pair of gloves and drill in the desired location with a 1/2" masonry bit. After drilling, make sure the bit is completely through the slab either by running something rigid along the inside of the borehole to feel the slab end or by visually observing soil cuttings on or from the drill bit. Ensure there is no water in the borehole before moving on. Again, soil gas samples should never be collected if there is a high possibility that groundwater may enter the sampling equipment. The groundwater will ruin the sampling and analysis equipment and invalidate the soil gas sample. If so, choose another sample location.

**5.2.3** Cut a piece of Teflon® tubing to a length of the slab thickness, plus two feet for room to reach sampling equipment. Straighten the end of the tubing and place it down the borehole to a height just above the bottom of the slab. If there is unconsolidated soil present that could potentially clog the sampling inlet, a clean stainless-steel screen can be fastened to the end of the tubing.

**5.2.4** After brushing away concrete dust, a VOC-free clay or putty like media is then used to secure the tubing and create an air tight seal at the slab interface. After a leak test is conducted according to Section 6.3, the end of the sampling tube is then connected to the sampling device or crimped and secured if sampling is to happen later.

After sample collection according to a method described in Section 7, the holes are immediately abandoned by filling the borehole with cement. A slightly thin mixture of cement will ensure no bridging of the mixture as it pours and makes a more solid patch. A small diameter piece of wire is good for working cement into hole. Check the cement patch for effectiveness before leaving the site.

### 5.3 Installation of Permanent Sub-slab Soil Gas Sampling Ports

The following procedures are used to install a permanent sub-slab soil gas sampling port.

**5.3.1** Each sample location should be cleared to the best of the sampling team's ability following step 1 in Section 5.2 above.

**5.3.2** Don a clean pair of gloves and drill in the desired location with a 1" masonry bit to a depth needed to just submerge the permanent sample port body into the concrete to have a flush final product. Finish drilling the remainder of the slab thickness with a 1/2" masonry bit. After drilling, make sure the bit is completely through the slab either by running something rigid along the inside of the borehole to feel the slab end or by visually seeing soil cuttings on the drill bit. Ensure there is no water in the borehole before moving on. If so, choose another sample location.

**5.3.3** The port should be made of stainless steel with an air tight connection to a length of stainless steel 1/4" tubing long enough to reach down to just above the bottom of the slab and have a cap or plug that can make an air tight seal when left between sampling events. Again, a clean stainless-steel screen can be added to the end of the sample tube if needed to prevent soil from penetrating the sample inlet.

**5.3.4** Place the permanent sample port into the drilled borehole with a piece of malleable VOC-free media to seal the hole where it narrows (to keep the cement off the sample inlet). Seal the sample port in place using anchor cement and allow to set overnight.

**5.3.5** After port is set, perform a leak test as described in Section 6.3. If the sample port passes the leak test, samples may then be collected by one of the methods described in Section 7. Leak tests should be completed for every sampling event, as torquing the plug can crack the anchor cement over time.

## 6 Helium Leak Testing of PRT Soil Gas Sampling Installations

### 6.1 General

Leak testing of soil gas sampling installations should be conducted if the sampling equipment has a connection that if compromised would emit ambient air into the soil gas sample. For sub-slab soil gas sample ports, it is most important to leak test temporary sample ports as the integrity of the seal made by the malleable VOC-free media used can be easily damaged.

### 6.2 Helium Leak Testing Procedures for PRT Soil Gas Sampling Installations

**6.2.1** The sampling system will be leak checked by inserting a 1/8" diameter Teflon® tubing into the drive rod next to the 1/4-inch diameter Teflon® sampling tubing, until it bottoms out a few inches above PRT adaptor. The 1/8" diameter tubing will be connected to a 99.999% pure helium source.

**6.2.2** A second length of 1/4" Teflon® tubing will be inserted into the drive rod to a point

approximately one foot below the top of the rod. The free end of this tubing will be connected to a helium meter that will monitor the helium content of the drive rod during the leak test.

**6.2.3** The top of the drive rod and tubing will be sealed with Parafilm® to retain the helium for the leak test. The drive rod will be filled with helium to a concentration of greater than 90%, while a soil gas sample is collected into a Tedlar® bag through the 1/4" Teflon® sample tube for on-site sample analysis of helium content. When the Tedlar® bag is disconnected from the sample tubing the sample tubing is crimped and held with a rubber band or cable tie, to prevent ambient air from entering the sample tube. The helium concentration in the Tedlar® bag must be less than 10% of the helium concentration in the drive rod to insure integrity of the soil gas sampling well. When the leak test is complete, the Parafilm®, helium supply, and monitoring tubes will be removed, leaving the sample tube.

### 6.3 Helium Leak Testing Procedures for Sub-slab Soil Gas Sample Ports

**6.3.1** The sampling system will be leak checked by covering the sample port with a shroud that can be filled from a 99.999% pure helium source. The shroud will allow two other ports where the leak check sample can be pulled and the helium concentration in the shroud can be testing similar to the set-up in Section 5.2 above.

**6.3.2** The shroud will be filled with helium to a concentration of greater than 90%, while a soil gas sample is collected into a Tedlar® bag through the 1/4" Teflon® sample tube for on-site sample analysis of helium content. When the Tedlar® bag is disconnected from the sample tubing the sample tubing is crimped and held with a rubber band or cable tie, to prevent ambient air from entering the sample tube. The helium concentration in the Tedlar® bag must be less than 10% of the helium concentration in the shroud to insure integrity of the soil gas sampling port. When the leak test is complete, the shroud, helium supply, and monitoring tubes will be removed, leaving the sample tube connected to the port.

**6.3.3** For temporary sub-slab sample ports, if the leak test fails, the malleable VOC-free media can be reinserted, added to, or shifted and tested again. After the sample port passes, take care in not moving or shifting the seal media before sample collection.

## 7 Sampling Soil Gas Installations

**7.1** Soil gas samples may be collected from PRT and permanent soil gas implant installations using one of several methods, listed below. Canister sampling is the most common method utilized by LSASD.

**7.1.1** Canister Sampling for Laboratory Analysis – After installation is complete and immediately prior to sampling, a flow-limiting device, consisting of a Nupro® 7-micron sintered stainless steel filter, a critical orifice and gauge is attached to an evacuated canister for sampling. A sampler leak check is conducted by plugging the inlet of the flow control device and opening the canister valve momentarily. After the valve

has been closed the needle on the gauge should not move (remain at full vacuum) indicating that at the sampler is leak free.

**7.1.2** Once the PRT installation or the sub-slab sample port has passed the helium leak test as described in Section 5 and the sampler leak check has been completed, the Teflon® sample tube is connected to the flow-limiting device using a Swagelok® or other suitable secure connection. After connection, the rubber band (if used) is cut and the crimp in the Teflon® tubing straightened and the valve on the canister is opened, pulling soil gas from the implant into the canister. Typically, the sample is collected over a one-hour period (depending on soil conditions), at which time the canister valve is closed, and the canister tagged with pertinent sampling information. When using this type of device, it is advisable to check the canister vacuum throughout the sampling period to verify filling. The initial and final gauge pressure/vacuum reading should be recorded in the project logbook.

**7.1.3** Real-time Field Analytical Methods – Real-time analytical measurements may be obtained from PRT, soil gas implant, or sub-slab port installations using appropriate instrumentation. The soil gas to be analyzed may be drawn directly into the instrument by the instrument pump or the instrument may be placed in line and the sample drawn into the instrument using a suitable pump connected to the discharge side of the instrument. Results may be qualitative, such as those obtained with flame ionization or photoionization detectors, or they may be quantitative, for instruments which can be calibrated to specific compounds.

# 8 References

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# 9 Revision History

The top row of this table shows the most recent changes to this controlled document. For previous revision history information, archived versions of this document are maintained by the LSASD Quality Assurance Coordinator on the LSASD local area network (LAN).

| History | Effective Date |
|---|---|
| Replaced Chief with Supervisor; General formatting revisions. | April 22, 2023 |
| LSASDPROC-307-R4, *Soil Gas Sampling*, replaces LSASDPROC-307-R3<br><br>**General:** Corrected any typographical, grammatical, and/or editorial errors. Soil gas sampling procedures were updated, and helium leak testing and sub-slab sampling procedures were added to the document. SESD updated to LSASD.<br><br>**Cover Page:** Changed the Author from Tim Slagle to Landon Pruitt. Changed Enforcement and Investigation Branch to Applied Sciences Branch. Changed Science and Ecosystem Support Division to Laboratory Services and Applied Science Division. Quality manager Bobby Lewis was changed to Stacy Masters.<br><br>**Revision History:** Changes were made to reflect the current practice of only including the most recent changes in the revision history. | February 7, 2020 |
| LSASDPROC-307-R3, *Soil Gas Sampling*, replaces LSASDPROC-307-R2 | May 14, 2014 |
| LSASDPROC-307-R2, *Soil Gas Sampling*, replaces LSASDPROC-307-R1 | September 8, 2010 |
| LSASDPROC-307-R1, *Soil Gas Sampling*, replaces LSASDPROC-307-R0 | November 1, 2007 |
| LSASDPROC-307-R0, Soil Gas Sampling, Original Issue | February 05, 2007 |

# SUMMA CANISTER SAMPLING

SOP#: 1704
DATE: 07/27/95
REV. #: 0.1

## 1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to describe a procedure for sampling of volatile organic compounds (VOCs) in ambient air. The method is based on samples collected as whole air samples in Summa passivated stainless steel canisters. The VOCs are subsequently separated by gas chromatography (GC) and measured by mass-selective detector or multidetector techniques. This method presents procedures for sampling into canisters at final pressures both above and below atmospheric pressure (respectively referred to as pressurized and subatmospheric pressure sampling).

This method is applicable to specific VOCs that have been tested and determined to be stable when stored in pressurized and subatmospheric pressure canisters. The organic compounds that have been successfully collected in pressurized canisters by this method are listed in the Volatile Organic Compound Data Sheet (Appendix A). These compounds have been measured at the parts per billion by volume (ppbv) level.

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent on site conditions, equipment limitations or limitations imposed by the procedure or other procedure limitations. In all instances, the ultimate procedures employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute U.S. EPA endorsement or recommendation for use.

## 2.0 METHOD SUMMARY

Both subatmospheric pressure and pressurized sampling modes use an initially evacuated canister. Both modes may also use a mass flow controller/vacuum pump arrangement to regulate flow. With the above configuration, a sample of ambient air is drawn through a sampling train comprised of components that regulate the rate and duration of sampling into a pre-evacuated Summa passivated canister. Alternatively, subatmospheric pressure sampling may be performed using a fixed orifice, capillary, or adjustable micrometering valve in lieu of the mass flow controller/vacuum pump arrangement for taking grab samples or short duration time-integrated samples. Usually, the alternative types of flow controllers are appropriate only in situations where screening samples are taken to assess for future sampling activities.

## 3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

After the air sample is collected, the canister valve is closed, an identification tag is attached to the canister, and the canister is transported to a laboratory for analysis. Upon receipt at the laboratory, the canister tag data is recorded. Sample holding times and expiration should be determined prior to initiating field activities.

## 4.0 INTERFERENCES AND POTENTIAL PROBLEMS

Contamination may occur in the sampling system if canisters are not properly cleaned before use. Additionally, all other sampling equipment (e.g., pump and flow controllers) should be thoroughly cleaned.

## 5.0 EQUIPMENT/APPARATUS

The following equipment/apparatus (Figure 1, Appendix B) is required:

## 5.1 Subatmospheric Pressure Sampling Equipment

1. VOC canister sampler - whole air sampler capable of filling an initially evacuated canister by action of the flow controlled pump from vacuum to near atmospheric pressure. (Andersen Samplers Inc., Model 87-100 or equivalent).

2. Sampling inlet line - stainless steel tubing to connect the sampler to the sample inlet.

3. Sample canister - leak-free stainless steel pressure vessels of desired volume with valve and Summa passivated interior surfaces (Scientific Instrumentation Specialist, Inc., ID 83843, Andersen Samplers, Inc., or equivalent).

4. Particulate matter filter - 2-µm sintered stainless steel in-line filter (Nupro Co., Model SS-2F-K4-2, or equivalent).

5. Chromatographic grade stainless steel tubing and fittings - for interconnections (Alltech Associates, Cat. #8125, or equivalent). All materials in contact with sample, analyte, and support gases should be chromatographic grade stainless steel.

6. Fixed orifice, capillary, or adjustable micrometering valve - used in lieu of the electronic flow controller/vacuum pump for grab samples or short duration time-integrated samples.

## 5.2 Pressurized Sampling Equipment

1. VOC canister sampler - whole air sampler capable of filling an initially evacuated canister by action of the flow controlled pump from vacuum to near atmospheric pressure. (Andersen Samplers Inc., Model 87-100).

2. Sampling inlet line - stainless steel tubing to connect the sampler to the sample inlet.

3. Sample canister - leak-free stainless steel pressure vessels of desired volume with valve and Summa passivated interior surfaces (Scientific Instrumentation Specialist, Inc., ID 83843, Andersen Samplers, Inc., or equivalent).

4. Particulate matter filter - 2-µm sintered stainless steel in-line filter (Nupro Co., Model SS-2F-K4-2, or equivalent).

5. Chromatographic grade stainless steel tubing and fittings - for interconnections (Alltech Associates, Cat. #8125, or equivalent). All materials in contact with sample, analyte, and support gases should be chromatographic grade stainless steel.

# 6.0 REAGENTS

This section is not applicable to this SOP.

# 7.0 PROCEDURE

## 7.1 Subatmospheric Pressure Sampling

### 7.1.1 Sampling Using a Fixed Orifice, Capillary, or Adjustable Micrometering Valve

1. Prior to sample collection, the appropriate information is completed on the Canister Sampling Field Data Sheet (Appendix C).

2. A canister, which is evacuated to 0.05 mm Hg and fitted with a flow restricting device, is opened to the atmosphere containing the VOCs to be sampled.

3. The pressure differential causes the sample to flow into the canister.

4. This technique may be used to collect grab samples (duration of 10 to 30 seconds) or time-integrated samples (duration of 12 to 24 hours). The sampling duration depends on the degree to which the flow is restricted.

5. A critical orifice flow restrictor will have a decrease in the flow rate as the pressure approaches atmospheric.

6. Upon sample completion at the location, the appropriate information is recorded on the

Canister Sampling Field Data Sheet.

### 7.1.2 Sampling Using a Mass Flow Controller/Vacuum Pump Arrangement (Andersen Sampler Model 87-100)

1. Prior to sample collection the appropriate information is completed on the Canister Sampling Field Data Sheet (Appendix C).

2. A canister, which is evacuated to 0.05 mm Hg and connected in line with the sampler, is opened to the atmosphere containing the VOCs to be sampled.

3. A whole air sample is drawn into the system through a stainless steel inlet tube by a direct drive blower motor assembly.

4. A small portion of this whole air sample is pulled from the inlet tube by a specially modified inert vacuum pump in conjunction with a mass flow controller.

5. The initially evacuated canister is filled by action of the flow controlled pump to near atmospheric pressure.

6. A digital time-program is used to pre-select sample duration and start and stop times.

7. Upon sample completion at the location, the appropriate information is recorded on the Canister Sampling Field Data Sheet.

## 7.2 Pressurized Sampling

### 7.2.1 Sampling Using a Mass Flow Controller/Vacuum Pump Arrangement (Anderson Sampler Model 87-100)

1. Prior to sample commencement at the location, the appropriate information is completed on the Canister Sampling Field Data Sheet.

2. A canister, which is evacuated to 0.05 mm Hg and connected in line with the sampler, is opened to the atmosphere containing the VOCs to be sampled.

3. A whole air sample is drawn into the system through a stainless steel inlet tube by a direct drive blower motor assembly.

4. A small portion of this whole air sample is pulled from the inlet tube by a specially modified inert vacuum pump in conjunction with a mass flow controller.

5. The initially evacuated canister is filled by action of the flow controlled pump to a positive pressure not to exceed 25 psig.

6. A digital time-programmer is used to pre-select sample duration and start and stop times.

7. Upon sample completion at the location, the appropriate information is recorded on the Canister Sampling Field Data Sheet.

## 8.0 CALCULATIONS

1. A flow control device is chosen to maintain a constant flow into the canister over the desired sample period. This flow rate is determined so the canister is filled to about 88.1 kPa for subatmospheric pressure sampling or to about one atmosphere above ambient pressure for pressurized sampling over the desired sample period. The flow rate can be calculated by:

$$F = \frac{(P)(V)}{(T)(60)}$$

where:

| | | |
|---|---|---|
| F | = | flow rate ($cm^3$/min) |
| P | = | final canister pressure, atmospheres absolute |
| V | = | volume of the canister ($cm^3$) |
| T | = | sample period (hours) |

For example, if a 6-L canister is to be filled to 202 kPa (two atmospheres) absolute pressure in 24 hours, the flow rate can be calculated by:

$$F = \frac{(2)(6000)}{(24)(60)} = 8.3 cm^3/\text{min}$$

2. If the canister pressure is increased, a dilution factor (DF) is calculated and recorded on the sampling data sheet.

$$DF = \frac{Ya}{Xa}$$

where:

Xa = canister pressure (kPa, psia) absolute before dilution.

Ya = canister pressure (kPa, psia) absolute after dilution.

After sample analysis, detected VOC concentrations are multiplied by the dilution factor to determine concentration in the sampled air.

## 9.0 QUALITY ASSURANCE/ QUALITY CONTROL

The following general quality assurance procedures apply:

1. All data must be documented on standard chain of custody records, field data sheets, or site logbooks.

2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation, and they must be documented.

## 10.0 DATA VALIDATION

This section is not applicable to this SOP.

## 11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA, and corporate health and safety practices. Specifically, pressurizing of Summa canisters should be performed in a well ventilated room, or preferably under a fume hood. Care must be taken not to exceed 40 psi in the canisters. Canisters are under pressure, albeit only 20-30 psi, and should not be dented or punctured. They should be stored in a cool dry place and always be placed in their plastic shipping boxes during transport and storage.

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# APPENDIX A

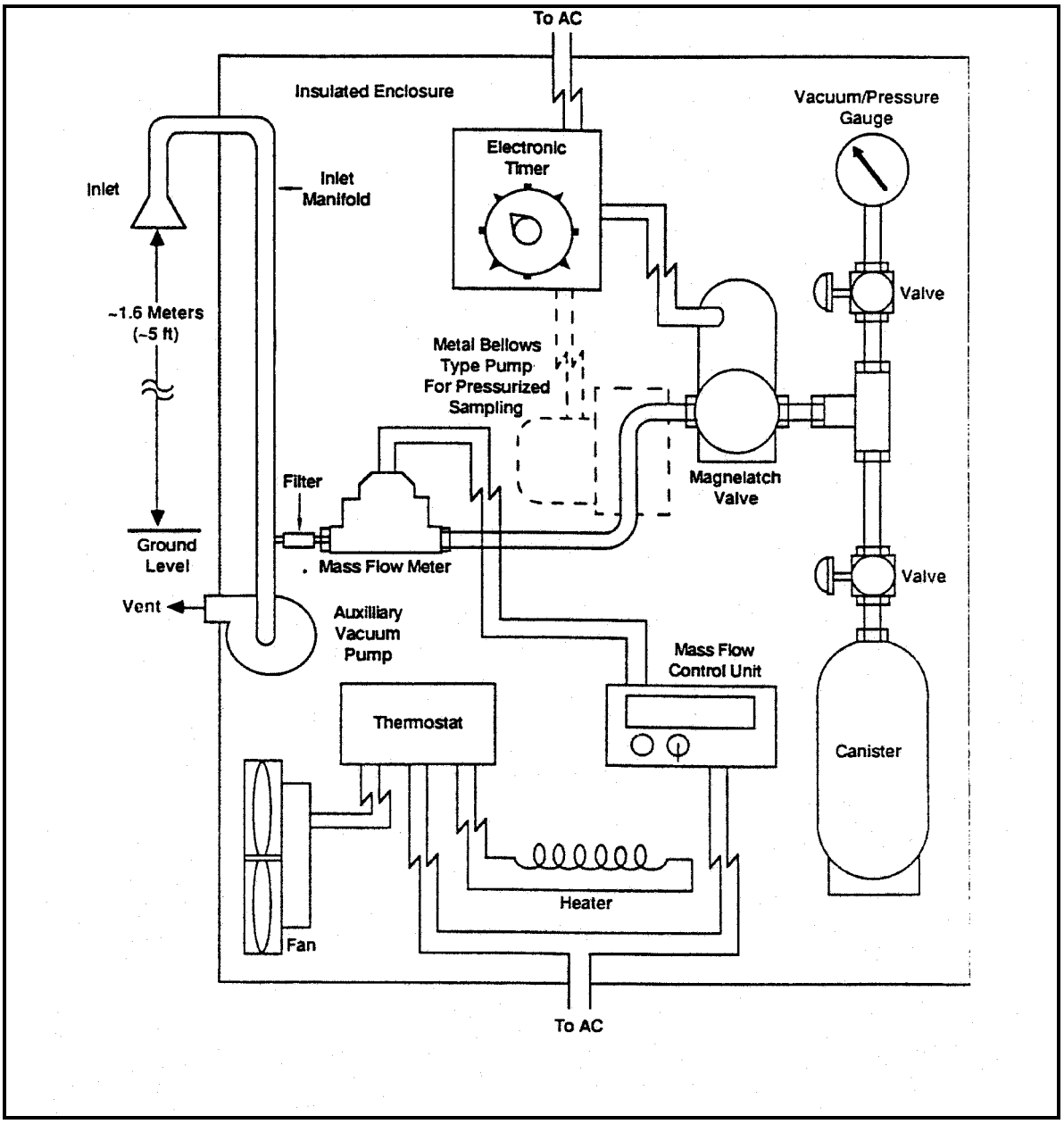
Volatile Organic Compound Data Sheet

TABLE 1. VOLATILE ORGANIC COMPOUND DATA SHEET

| COMPOUND (SYNONYM) | FORMULA | MOLECULAR WEIGHT | BOILING POINT (°C) | MELTING POINT (°C) | CAS NUMBER |
|---|---|---|---|---|---|
| Freon 12 (Dichlorodifluoromethane) | $Cl_2CF_2$ | 120.91 | -29.8 | -158.0 | |
| Methyl chloride (Chloromethane) | $CH_3Cl$ | 50.49 | -24.2 | -97.1 | 74-87-3 |
| Freon 114 (1,2-Dichloro-1,1,2,2-tetrafluoroethane) | $ClCF_2CClF_2$ | 170.93 | 4.1 | -94.0 | |
| Vinyl chloride (Chloroethylene) | $CH_2=CHCl$ | 62.50 | -13.4 | -1538.0 | 75-01-4 |
| Methyl bromide (Bromomethane) | $CH_3Br$ | 94.94 | 3.6 | -93.6 | 74-83-9 |
| Ethyl chloride (Chloroethane) | $CH_3CH_2Cl$ | 64.52 | 12.3 | -136.4 | 75-00-3 |
| Freon 11 (Trichlorofluoromethane) | $CCl_3F$ | 137.38 | 23.7 | -111.0 | |
| Vinylidene chloride (1,1-Dichloroethene) | $C_2H_2Cl_2$ | 96.95 | 31.7 | -122.5 | 75-35-4 |
| Dichloromethane (Methylene chloride) | $CH_2Cl_2$ | 84.94 | 39.8 | -95.1 | 75-09-2 |
| Freon 113 (1,1,2-Trichloro-1,2,2-trifluoroethane) | $CF_2ClCCl_2F$ | 187.38 | 47.7 | -36.4 | |
| 1,1-Dichloroethane (Ethylidene chloride) | $CH_3CHCl_2$ | 98.96 | 57.3 | -97.0 | 74-34-3 |
| cis-1,2-Dichloroethylene | $CHCl=CHCl$ | 96.94 | 60.3 | -80.5 | |
| Chloroform (Trichloromethane) | $CHCl_3$ | 119.38 | 61.7 | -63.5 | 67-66-3 |
| 1,2-Dichloroethane (Ethylene dichloride) | $ClCH_2CH_2Cl$ | 98.96 | 83.5 | -35.3 | 107-06-2 |
| Methyl chloroform (1,1,1-Trichloroethane) | $CH_3CCl_3$ | 133.41 | 74.1 | -30.4 | 71-55-6 |
| Benzene (Cyclohexatriene) | $C_6H_6$ | 78.12 | 80.1 | 5.5 | 71-43-2 |
| Carbon tetrachloride (Tetrachloromethane) | $CCl_4$ | 153.82 | 76.5 | -23.0 | 56-23-5 |
| 1,2-Dichloropropane (Propylene dichloride) | $CH_3CHClCH_2Cl$ | 112.99 | 96.4 | -100.4 | 78-87-5 |
| Trichloroethylene (Trichloroethene) | $ClCH=CCl_2$ | 131.29 | 87 | -73.0 | 79-01-6 |
| cis-1,3-Dichloropropene (cis-1,3-dichloropropylene) | $CH_3CCl=CHCl$ | 110.97 | 76 | | |
| trans-1,3-Dichloropropene (cis-1,3-Dichloropropylene) | $ClCH_2CH=CHCl$ | 110.97 | 112.0 | | |
| 1,1,2-Trichloroethane (Vinyl trichloride) | $CH_2ClCHCl_2$ | 133.41 | 113.8 | -36.5 | 79-00-5 |
| Toluene (Methyl benzene) | $C_6H_5CH_3$ | 92.15 | 110.6 | -95.0 | 108-88-3 |
| 1,2-Dibromoethane (Ethylene dibromide) | $BrCH_2CH_2Br$ | 187.88 | 131.3 | 9.8 | 106-93-4 |
| Tetrachloroethylene (Perchloroethylene) | $Cl_2C=CCl_2$ | 165.83 | 121.1 | -19.0 | 127-18-4 |
| Chlorobenzene (Phenyl chloride) | $C_6H_5Cl$ | 112.56 | 132.0 | -45.6 | 108-90-7 |
| Ethylbenzene | $C_6H_5C_2H_5$ | 106.17 | 136.2 | -95.0 | 100-41-4 |
| m-Xylene (1,3-Dimethylbenzene) | $1,3-(CH_3)_2C_6H_4$ | 106.17 | 139.1 | -47.9 | |
| p-Xylene (1,4-Dimethylxylene) | $1,4-(CH_3)_2C_6H_4$ | 106.17 | 138.3 | 13.3 | |
| Styrene (Vinyl benzene) | $C_6H_5CH=CH_2$ | 104.16 | 145.2 | -30.6 | 100-42-5 |
| 1,1,2,2-Tetrachloroethane | $CHCl_2CHCl_2$ | 167.85 | 146.2 | -36.0 | 79-34-5 |
| o-Xylene (1,2-Dimethylbenzene) | $1,2-(CH_3)_2C_6H_4$ | 106.17 | 144.4 | -25.2 | |
| 1,3,5-Trimethylbenzene (Mesitylene) | $1,3,5-(CH_3)_3C_6H_6$ | 120.20 | 164.7 | -44.7 | 108-67-8 |
| 1,2,4-Trimethylbenzene (Pseudocumene) | $1,2,4-(CH_3)_3C_6H_6$ | 120.20 | 169.3 | -43.8 | 95-63-6 |
| m-Dichlorobenzene (1,3-Dichlorobenzene) | $1,3-Cl_2C_6H_4$ | 147.01 | 173.0 | -24.7 | 541-73-1 |
| Benzyl chloride (α-Chlorotoluene) | $C_6H_5CH_2Cl$ | 126.59 | 179.3 | -39.0 | 100-44-7 |
| o-Dichlorobenzene (1,2-Dichlorobenzene) | $1,2-Cl_2C_6H_4$ | 147.01 | 180.5 | -17.0 | 95-50-1 |
| p-Dichlorobenzene (1,4-Dichlorobenzene) | $1,4-Cl_2C_6H_4$ | 147.01 | 174.0 | 53.1 | 106-46-7 |
| 1,2,4-Trichlorobenzene | $1,2,4-Cl_3C_6H_3$ | 181.45 | 213.5 | 17.0 | 120-82-1 |
| Hexachlorobutadiene (1,1,2,3,4,4-Hexachloro-1,3-butadiene) | | | | | |

# APPENDIX B

FIGURE 1. Subatmospheric/Pressurized Sampling Equipment



# APPENDIX C

Canister Sampling Field Data Sheet

Page ___ of ___

SUMMA AIR SAMPLING WORK SHEET

Site: _____ Site#: _____
Samplers: _____ Work Assignment Manager: _____
Date: _____ Project Leader: _____

| | | | | | |
|---|---|---|---|---|---|
| Sample # | | | | | |
| Location | | | | | |
| SUMMA ID | | | | | |
| Orifice Used | | | | | |
| Analysis/Method | | | | | |
| Time (Start) | | | | | |
| Time (Stop) | | | | | |
| Total Time | | | | | |
| SUMMA WENT TO AMBIENT | YES/NO | YES/NO | YES/NO | YES/NO | YES/NO |
| Pressure Gauge | | | | | |
| Pressure Gauge | | | | | |
| Flow Rate (Pre) | | | | | |
| Flow Rate (Post) | | | | | |
| Flow Rate (Average) | | | | | |

MET Station On-site? Y / N

General Comments: