# CHAIN OF CUSTODY,
# PM CONFIRMATION
# AND
# SAMPLE CONDITION FORMS
# DOCUMENTS

CT LABORATORIES
delivering more than data from your environmental analyses

# Sample Condition Report

Folder #: 122977
Client: CH2M HILL

Print Date / Time: 10/18/2016 12:37
Received Date / Time / By: 10/18/2016 12:30 BNA

Project Name: MODINE MFG
Project Phase: 221 SUNSET DR

Log-In Date / Time / By: 10/18/2016 12:36 BNA
Project #: 681225 PM: ETK

Coolers: 5505
Custody Seals Present : **Y**

Temperature: 0.2 C On Ice: **Y**
COC Present:? **Y** Complete? **Y**

Seal Intact? **Y**
Ship Method: FED EX
Adequate Packaging: **Y**

Numbers: SIGNED AND DATED
Tracking Number: 0201784365340499
Temp Blank Enclosed? **Y**

Notes: SAMPLES RECEVIED IN GOOD CONDITION INTACT ON ICE WITH CUSTODY SEALS INTACT SIGNED AND DATED

| Sample ID / Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|
| **790208** TRIP BLANK | | | | |
| | VOA HCL | 1 | / | VOC |
| | VOA HCL | 1 | / | VOC |
| | **Total # of Containers of Type** | ( ***VOA HCL*** ) = | **2** | |

| Sample ID / Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|
| **790209** SB117S-SO-2-101516 | | | | |
| | SOLIDS | 1 | / | %SOL |
| | **Total # of Containers of Type** | ( ***SOLIDS*** ) = | **1** | |
| **790209** SB117S-SO-2-101516 | | | | |
| | MISC | 1 | / | TOC |
| | **Total # of Containers of Type** | ( ***MISC*** ) = | **1** | |
| **790209** SB117S-SO-2-101516 | | | | |
| | MEOH TARED | 1 | / | VOC |
| | MEOH TARED | 1 | / | VOC |
| | **Total # of Containers of Type** | ( ***MEOH TARED*** ) = | **2** | |

| Sample ID / Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|
| **790213** SB117S-SO-5-101516 | | | | |
| | SOLIDS | 1 | / | %SOL |
| | **Total # of Containers of Type** | ( ***SOLIDS*** ) = | **1** | |
| **790213** SB117S-SO-5-101516 | | | | |
| | MISC | 1 | / | TOC |
| | **Total # of Containers of Type** | ( ***MISC*** ) = | **1** | |
| **790213** SB117S-SO-5-101516 | | | | |

| | | | | |
|---|---|---|---|---|
| MEOH TARED | 1 | / | VOC |
| MEOH TARED | 1 | / | VOC |

**Total # of Containers of Type ( *MEOH TARED* ) = 2**

| Sample ID / Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|
| **790214** SB117S-SO-13-101516 | | | | |
| | SOLIDS | 1 | / | %SOL |

**Total # of Containers of Type ( *SOLIDS* ) = 1**

| | | | | |
|---|---|---|---|---|
| **790214** SB117S-SO-13-101516 | | | | |
| | MISC | 1 | / | TOC |

**Total # of Containers of Type ( *MISC* ) = 1**

| | | | | |
|---|---|---|---|---|
| **790214** SB117S-SO-13-101516 | | | | |
| | MEOH TARED | 1 | / | VOC |
| | MEOH TARED | 1 | / | VOC |

**Total # of Containers of Type ( *MEOH TARED* ) = 2**

| Sample ID / Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|
| **790215** SB117S-SO-13-101516-FD | | | | |
| | SOLIDS | 1 | / | %SOL |

**Total # of Containers of Type ( *SOLIDS* ) = 1**

| | | | | |
|---|---|---|---|---|
| **790215** SB117S-SO-13-101516-FD | | | | |
| | MISC | 1 | / | TOC |

**Total # of Containers of Type ( *MISC* ) = 1**

| | | | | |
|---|---|---|---|---|
| **790215** SB117S-SO-13-101516-FD | | | | |
| | MEOH TARED | 1 | / | VOC |
| | MEOH TARED | 1 | / | VOC |

**Total # of Containers of Type ( *MEOH TARED* ) = 2**

| Sample ID / Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|
| **790216** SB119D-SO-15-101516 | | | | |
| | SOLIDS | 1 | / | %SOL |

**Total # of Containers of Type ( *SOLIDS* ) = 1**

| | | | | |
|---|---|---|---|---|
| **790216** SB119D-SO-15-101516 | | | | |
| | MISC | 1 | / | TOC |

**Total # of Containers of Type ( *MISC* ) = 1**

| | | | | |
|---|---|---|---|---|
| **790216** SB119D-SO-15-101516 | | | | |
| | MEOH TARED | 1 | / | VOC |
| | MEOH TARED | 1 | / | VOC |

**Total # of Containers of Type ( *MEOH TARED* ) = 2**

| Sample ID / Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|
| **790217** SB119D-S0-19-101516 | | | | |

| | | | | |
|---|---|---|---|---|
| | SOLIDS | 1 | / | %SOL |
| | **Total # of Containers of Type** | ( ***SOLIDS*** ) = | **1** | |

**790217** SB119D-S0-19-101516

| | | | |
|---|---|---|---|
| MISC | 1 | / | TOC |
| **Total # of Containers of Type** | ( ***MISC*** ) = | **1** | |

**790217** SB119D-S0-19-101516

| | | | |
|---|---|---|---|
| MEOH TARED | 1 | / | VOC |
| MEOH TARED | 1 | / | VOC |
| **Total # of Containers of Type** | ( ***MEOH TARED*** ) = | **2** | |

| Sample ID / Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|

**790218** SB119D-SO-32-101516

| | | | |
|---|---|---|---|
| SOLIDS | 1 | / | %SOL |
| **Total # of Containers of Type** | ( ***SOLIDS*** ) = | **1** | |

**790218** SB119D-SO-32-101516

| | | | |
|---|---|---|---|
| MISC | 1 | / | TOC |
| **Total # of Containers of Type** | ( ***MISC*** ) = | **1** | |

**790218** SB119D-SO-32-101516

| | | | |
|---|---|---|---|
| MEOH TARED | 1 | / | VOC |
| MEOH TARED | 1 | / | VOC |
| **Total # of Containers of Type** | ( ***MEOH TARED*** ) = | **2** | |

| Sample ID / Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|

**790219** SB118S-SO-9-101616

| | | | |
|---|---|---|---|
| SOLIDS | 1 | / | %SOL |
| **Total # of Containers of Type** | ( ***SOLIDS*** ) = | **1** | |

**790219** SB118S-SO-9-101616

| | | | |
|---|---|---|---|
| MISC | 1 | / | TOC |
| **Total # of Containers of Type** | ( ***MISC*** ) = | **1** | |

**790219** SB118S-SO-9-101616

| | | | |
|---|---|---|---|
| MEOH TARED | 1 | / | VOC |
| MEOH TARED | 1 | / | VOC |
| **Total # of Containers of Type** | ( ***MEOH TARED*** ) = | **2** | |

| Sample ID / Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|

**790220** SB118S-SO-11-101616

| | | | |
|---|---|---|---|
| SOLIDS | 1 | / | %SOL |
| **Total # of Containers of Type** | ( ***SOLIDS*** ) = | **1** | |

**790220** SB118S-SO-11-101616

| | | | |
|---|---|---|---|
| MISC | 1 | / | TOC |
| **Total # of Containers of Type** | ( ***MISC*** ) = | **1** | |

| | | | | | |
|---|---|---|---|---|---|
| **790220** | SB118S-SO-11-101616 | | | | |
| | | MEOH TARED | 1 | / | VOC |
| | | MEOH TARED | 1 | / | VOC |
| | | **Total # of Containers of Type** | ( ***MEOH TARED*** ) = | **2** | |

| Sample ID / | Description | Container Type | Cond. Code | pH OK?/Filtered? | Tests |
|---|---|---|---|---|---|
| **790221** | SB118S-SO-15-101616 | | | | |
| | | SOLIDS | 1 | / | %SOL |
| | | **Total # of Containers of Type** | ( ***SOLIDS*** ) = | **1** | |
| **790221** | SB118S-SO-15-101616 | | | | |
| | | MISC | 1 | / | TOC |
| | | **Total # of Containers of Type** | ( ***MISC*** ) = | **1** | |
| **790221** | SB118S-SO-15-101616 | | | | |
| | | MEOH TARED | 1 | / | VOC |
| | | MEOH TARED | 1 | / | VOC |
| | | **Total # of Containers of Type** | ( ***MEOH TARED*** ) = | **2** | |

| *Condition Code* | *Condition Description* |
|---|---|
| 1 | Sample Received OK |

122977

Rev 8/2014

# CHAIN OF CUSTODY

Page 1 of 1

Company: CH2M

Project Contact: Monica Schneider

Telephone: 314-605-4616

Project Name: 221 Sunset

Project #: 681225

Location: Condgeton, MO

Sampled By: P. Ferringer

CT LABORATORIES

Folder # 122977

Company: CH2M HILL

Project: 221 SUNSET DR

Logged By: RSV PM ET

1230 Lange Court, Baraboo, WI 53913
608-356-2760 Fax 608-356-2766
www.ctlaboratories.com

Program:
QSM RCRA SDWA NPDES
Solid Waste Other _____

PO #

Report To: Amy Klopper
EMAIL: amy.klopper@ch2m.com
Company:
Address:

Invoice To:*
EMAIL:
Company:
Address:

*Party listed is responsible for payment of invoice as per CT Laboratories' terms and conditions

**Client Special Instructions**

Standard TAT

Matrix:
GW – groundwater SW - surface water WW - wastewater DW - drinking water
S - soil/sediment SL - sludge A - air M - misc/waste

Turnaround Time
Normal RUSH*
Date Needed: 5 day
*Rush analysis requires prior CT Laboratories' approval*
Surcharges:
24 hr 200%
2-3 days 100%
4-9 days 50%

ANALYSES REQUESTED

| Collection Date | Collection Time | Matrix | Grab/ Comp | Sample # | Sample ID Description | Filtered? Y/N | 8260C | TOC | | | | | | | | | | | | Total # Containers | Designated MS/MSD | CT Lab ID # (Lab use only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Fill in Spaces with Bottles per Test | | | | | | | | | | | | | | | |
| 10/15 | | | | | Trip Blank | | | | | | | | | | | | | | | 2 | | 790208 |
| ~~10/15 1000~~ | 1000 | S | G | | SB1175-SO-2-101516 | | X | X | | | | | | | | | | | | 4 | | 790209 |
| 10/15 | 1002 | S | G | | SB1175-SO-5-101516 | | X | X | | | | | | | | | | | | 4 | | 790213 |
| 10/15 | 1005 | S | G | | SB1175-SO-13-101516 | | X | X | | | | | | | | | | | | 4 | | 790214 |
| 10/15 | 1005 | S | G | | SB1175-SO-13-101516-ED | | X | X | | | | | | | | | | | | 4 | | 790215 |
| 10/15 | 1745 | S | G | | SB1190-SO-15-101516 | | X | X | | | | | | | | | | | | 4 | | 790216 |
| 10/15 | 1747 | S | G | | SB1190-SO-19-101516 | | X | X | | | | | | | | | | | | 4 | | 790217 |
| 10/15 | 1750 | S | G | | SB1190-SO-32-101516 | | X | X | | | | | | | | | | | | 4 | | 790218 |
| 10/16 | 1620 | S | G | | SB1185-SO-9-101616 | | X | X | | | | | | | | | | | | 4 | | 790219 |
| 10/16 | 1622 | S | G | | SB1185-SO-11-101616 | | X | X | | | | | | | | | | | | 4 | | 790220 |
| 10/16 | 1624 | S | G | | SB1185-SO-15-101616 | | X | X | | | | | | | | | | | | 4 | | 790221 |
| | | | | | | | | | | | | | | | | | | | | 4 | | |

Relinquished By: Patrick Ferringer
Date/Time: 10/17/16 1230

Received by:
Date/Time:

Received By:
Date/Time:

Received for Laboratory by:
Date/Time: 10-18-16 1236

Lab Use Only
Ice Present Yes No
Temp 0.2 IR Gun # 10
Cooler # 5505

10-18-16 1230

ORIGIN ID:SUSA (217) 416-2540
ZACHARY DOLBEARE
CH2MHILL INC
300 HUNTER AVENUE #305

ST. LOUIS, MO 63124
UNITED STATES US

SHIP DATE: 16OCT16
ACTWGT: 45.00 LB
CAD: 103963467/WSXI2500
DIMS: 21x13x13 IN

BILL SENDER

TO **ERIC KORTHALS**
**CT LABORATORIES**
**1230 LANGE COURT**

**BARABOO WI 53913**
(608) 356-2760 REF: 681225.GW.01
INV:
PO: DEPT:

544J3/FB42/14E8

FedEx Express

J1A2816121201sv

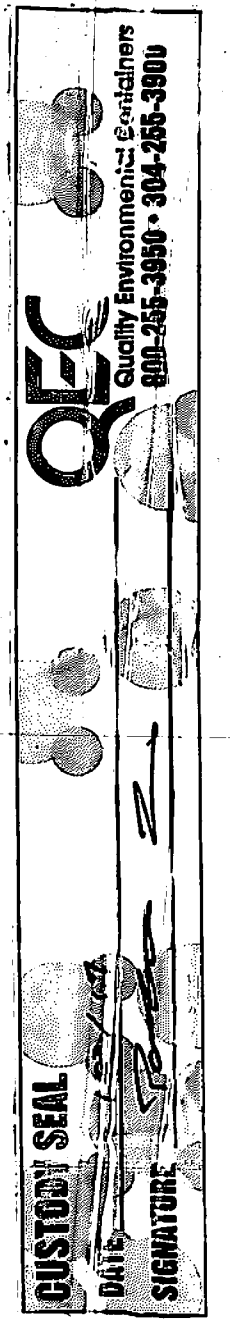
**TUE - 18 OCT 10:30A**
**PRIORITY OVERNIGHT**

TRK# 0201 **7843 6534 0499**

**NA MSNA**

**53913**
WI-US **MSN**

0.2°C
5505
10-18-16
1230
BA



**Folder #: 122977**

## *PM LOGIN CONFIRMATION*

## ******RUSH PROJECT******
## *REPORT DUE 10/25/2016*

**Contract #:** 2923

**Company:** CH2M HILL **Project:** MODINE MFG **Proj #:** 681225

**Project Phase:** 221 SUNSET DR **PO Number:** 10381-7-112252 **Invoice #:** 123511

**Project Manager:** *ETK* **Date Received:** 10/18/16 **Log Date:** 10/18/2016

Report To: SHANNON OLSON CC:
2020 SW 4TH AVE
PORTLAND, OR 97201
Phone: 503-736-4111: Fax:
Rep. E-Mail shannon.olson@ch2m.com

Invoice To :ACCOUNTS PAYABLE CC: CH2M POC: SHANNON OLSON
PO BOX 214329
DENVER, CO 80224
Phone: Fax:
EMail:

Collected By: PF
Collector's Phone: 503-736-4111

Arrival Temperature: 0.2 oC

**SAMPLE #: 790208 DESCR: TRIP BLANK** **PRIMARY / DETAILED MATRIX:** AQUEOUS / TRIP BLANK **SAMPLED: 10/15/2016**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/29/2016 | 10/24/2016 | *Y* | Logged |

**SAMPLE #: 790209 DESCR: SB117S-SO-2-101516** **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED: 10/15/2016 Time: 1000**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SOLIDS,PERCENT | (EPA 8000C) | | | | 10/29/2016 | 10/24/2016 | *Y* | Logged |
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/29/2016 | 10/24/2016 | *Y* | NeedPrep |
| 990 | ORGANIC CARBON QSM | (L-Kahn/9060A) | | | | 11/12/2016 | 10/24/2016 | *N* | Logged |

**SAMPLE #: 790213 DESCR: SB117S-SO-5-101516** **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED: 10/15/2016 Time: 1002**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|

**Folder #:** 122977 **Company:** *CH2M HILL* **Project:** MODINE MFG

**SAMPLE #: 790213 DESCR: SB117S-SO-5-101516** **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED: 10/15/2016 Time: 1002**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SOLIDS,PERCENT | (EPA 8000C) | | | | 10/29/2016 | 10/24/2016 | *Y* | Logged |
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/29/2016 | 10/24/2016 | *Y* | NeedPrep |
| 990 | ORGANIC CARBON QSM | (L-Kahn/9060A) | | | | 11/12/2016 | 10/24/2016 | *N* | Logged |

**SAMPLE #: 790214 DESCR: SB117S-SO-13-101516** **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED: 10/15/2016 Time: 1005**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SOLIDS,PERCENT | (EPA 8000C) | | | | 10/29/2016 | 10/24/2016 | *Y* | Logged |
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/29/2016 | 10/24/2016 | *Y* | NeedPrep |
| 990 | ORGANIC CARBON QSM | (L-Kahn/9060A) | | | | 11/12/2016 | 10/24/2016 | *N* | Logged |

**SAMPLE #: 790215 DESCR: SB117S-SO-13-101516-FD** **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED: 10/15/2016 Time: 1005**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SOLIDS,PERCENT | (EPA 8000C) | | | | 10/29/2016 | 10/24/2016 | *Y* | Logged |
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/29/2016 | 10/24/2016 | *Y* | NeedPrep |
| 990 | ORGANIC CARBON QSM | (L-Kahn/9060A) | | | | 11/12/2016 | 10/24/2016 | *N* | Logged |

**SAMPLE #: 790216 DESCR: SB119D-SO-15-101516** **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED: 10/15/2016 Time: 1745**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SOLIDS,PERCENT | (EPA 8000C) | | | | 10/29/2016 | 10/24/2016 | *Y* | Logged |
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/29/2016 | 10/24/2016 | *Y* | NeedPrep |
| 990 | ORGANIC CARBON QSM | (L-Kahn/9060A) | | | | 11/12/2016 | 10/24/2016 | *N* | Logged |

**Folder #:** 122977 **Company:** *CH2M HILL* **Project:** MODINE MFG

**SAMPLE #: 790217 DESCR: SB119D-S0-19-101516** **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED: 10/15/2016 Time: 1747**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SOLIDS,PERCENT | (EPA 8000C) | | | | 10/29/2016 | 10/24/2016 | *Y* | Logged |
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/29/2016 | 10/24/2016 | *Y* | NeedPrep |
| 990 | ORGANIC CARBON QSM | (L-Kahn/9060A) | | | | 11/12/2016 | 10/24/2016 | *N* | Logged |

**SAMPLE #: 790218 DESCR: SB119D-SO-32-101516** **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED: 10/15/2016 Time: 1750**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SOLIDS,PERCENT | (EPA 8000C) | | | | 10/29/2016 | 10/24/2016 | *Y* | Logged |
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/29/2016 | 10/24/2016 | *Y* | NeedPrep |
| 990 | ORGANIC CARBON QSM | (L-Kahn/9060A) | | | | 11/12/2016 | 10/24/2016 | *N* | Logged |

**SAMPLE #: 790219 DESCR: SB118S-SO-9-101616** **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED: 10/16/2016 Time: 1620**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SOLIDS,PERCENT | (EPA 8000C) | | | | 10/30/2016 | 10/24/2016 | *Y* | Logged |
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/30/2016 | 10/24/2016 | *Y* | NeedPrep |
| 990 | ORGANIC CARBON QSM | (L-Kahn/9060A) | | | | 11/13/2016 | 10/24/2016 | *N* | Logged |

**SAMPLE #: 790220 DESCR: SB118S-SO-11-101616** **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED: 10/16/2016 Time: 1622**

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SOLIDS,PERCENT | (EPA 8000C) | | | | 10/30/2016 | 10/24/2016 | *Y* | Logged |
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/30/2016 | 10/24/2016 | *Y* | NeedPrep |
| 990 | ORGANIC CARBON QSM | (L-Kahn/9060A) | | | | 11/13/2016 | 10/24/2016 | *N* | Logged |

**Folder #:** 122977 **Company:** *CH2M HILL* **Project:** MODINE MFG

**SAMPLE #:** 790221 **DESCR:** SB118S-SO-15-101616 **PRIMARY / DETAILED MATRIX:** SOLID / SOIL **SAMPLED:** 10/16/2016 **Time:** 1624

**CLIENT SAMPLE #:** **DETAILED SITE/POINT ID INFORMATION:**

| TEST# | TEST | TEST METHOD | ANALYTE | TEST GROUP | SPECIAL REQUIREMENTS | HOLD DATE | ANALYSIS DUE | RUSH | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 8 | SOLIDS,PERCENT | (EPA 8000C) | | | | 10/30/2016 | 10/24/2016 | *Y* | Logged |
| 779 | VOC 8260 QSM | (EPA 8260C) | | | *Y* | 10/30/2016 | 10/24/2016 | *Y* | NeedPrep |
| 990 | ORGANIC CARBON QSM | (L-Kahn/9060A) | | | | 11/13/2016 | 10/24/2016 | *N* | Logged |

**Invoice Number:** 123511 **Preliminary Invoice Estimate:** $ 1,285.00

| Item | Matrix | Quantity | Price | Expedited TAT Surcharge | Total |
|---|---|---|---|---|---|
| ORGANIC CARBON QSM | SOIL | 10 | $ 35.00 | 0.00 | $ 350.00 |
| SOLIDS,PERCENT | SOIL | 10 | $ 0.00 | 0.00 | $ 0.00 |
| VOC 8260 QSM | SOIL | 10 | $ 85.00 | 0.00 | $ 850.00 |
| VOC 8260 QSM | TRIP BLANK | 1 | $ 85.00 | 0.00 | $ 85.00 |
| Temporary Fuel Surcharge on lab supplies and services (if applicable): | | | | | $ 0.00 |

Bottle Information

| Container | # Containers | Tests |
|---|---|---|
| **MEOH TARED** | **20** | VOC |
| **MISC** | **10** | TOC |
| **SOLIDS** | **10** | %SOL |
| **VOA HCL** | **2** | VOC |

**CH2M Applied Sciences Laboratory (ASL)**

1100 NE Circle Blvd, Suite 300, Corvallis, OR 97330

**Tel 541.768.3120** Email: asl@ch2m.com

# Amended Report

| | | | |
|---|---|---|---|
| Date: | 12/29/16 | Client: | 221 Sunset |
| SDG No.: | Q3107 | Project/Task: | |
| Revision No.: | 2 | Completed by: | CH |
| Affected Method(s): | TO-15 SCAN | Approved by: | KJM |

**Amendment(s) Completed and Reason(s):**

Client requested change of Field IDs

**Amendment(s) Justification:**

| | |
|---|---|
| | Reporting error |
| | Calculation error |
| | Missing information/data |
| | Wrong information/data |
| | Analytical problem/correction |
| X | Client change/request |
| | Subcontracted laboratory error |
| | Other (define) |

**Edata Required:**

| | |
|---|---|
| X | Yes |
| | No |

# Analytical Report for

# 221 Sunset Drive

## ASL Report #: Q3107
## Project ID: 669272.16.01

**Attn: Kimberly Stokes**

Authorized and Released By:

Kathy McKinley

Laboratory Project Manager
Kathy McKinley
*(541) 758-0235 ext.23144*
*December 29, 2016*

All analyses performed by CH2M HILL are clearly indicated. Any subcontracted analyses are included as appended reports as received from the subcontracted laboratory. The results included in this report only relate to the samples listed on the following Sample Cross-Reference page. This report shall not be reproduced except in full, without the written approval of the laboratory.

Any unusual difficulties encountered during the analysis of your samples are discussed in the attached case narratives.

Accredited in accordance with NELAP:
Oregon (100022)
Louisiana (05031)

CH2M – Applied Sciences Laboratory
1100 NE Circle Boulevard, Suite 300
Corvallis, Oregon 97330 Email: asl@ch2m.com
www.ch2m.com

**ASL Report #: Q3107**

## Sample Receipt Comments

We certify that the test results meet all NELAP requirements.

## Sample Cross-Reference

| ASL Sample ID | Client Sample ID | Date/Time Collected | Date Received |
|---|---|---|---|
| Q310701 | MW100-SV-6.3-16.3-092816 | 09/28/16 13:03 | 10/03/16 |
| Q310702 | MW101-SV-23.7-33.7-092816 | 09/28/16 14:36 | 10/03/16 |
| Q310703 | MW105-SV-10.7-20.7-092916 | 09/29/16 11:31 | 10/03/16 |
| Q310704 | MW103-SV-3.7-8.7-092916 | 09/29/16 14:13 | 10/03/16 |
| Q310705 | MW103-SV-3.7-8.7-092916-FD | 09/29/16 14:13 | 10/03/16 |
| Q310706 | MW104-SV-3.7-5.7-092916 | 09/29/16 16:44 | 10/03/16 |
| Q310707 | MW107-SV-4.7-14.7-093016 | 09/30/16 09:36 | 10/03/16 |
| Q310708 | MW113D-SV-16-21-100116 | 10/01/16 08:40 | 10/03/16 |

## Table of Contents

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## Data Qualifiers

| | |
|---|---|
| U | The analyte was not detected and is reported as less than the quantitation (or detection) limit. |
| J | The analyte was positively identified and is reported as an estimated value below the quantitation limit. |
| E | The analyte was positively identified and the reported result exceeded the instrument calibration range. |
| B | Blank contamination—the reported result is associated with a contaminated blank. |
| M | A matrix effect was present. |
| R | The data must be evaluated for usability due to deficiencies in the ability to analyze the sample and meet QC criteria. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain QC criteria. |
| P | The primary and confirmation analyte result recoveries do not match (dual column analysis). |

CH2MHILL
Applied Sciences Laboratory (ASL)

# Applied Sciences Group QC Codes for Raw Data Mark Up

| Code | Description |
|---|---|
| R01 | Illegible entry |
| R02 | Unnecessary entry |
| R03 | Typo |
| R04 | Misspelled |
| R05 | Page mis-numbered |
| R06 | Transcription error or incorrect entry |
| R07 | Rounding error |
| R08 | Unused code |
| R09 | Unused code |
| R10 | Wrong date entered |
| R11 | Wrong sample number |
| R12 | Wrong dilution factor |
| R13 | Wrong concentration |
| R14 | Wrong batch number |
| R15 | Wrong standard concentration |
| R16 | Wrong standard lot # |
| R17 | Remake of standards |
| R18 | Unused code |
| R19 | Unused code |
| R20 | Re-calibration of equipment |
| R21 | Sample rerun |
| R22 | Miscalculation |
| R23 | Wrong detection limit given |
| R24 | Less than reporting limit |
| R25 | Non-target compound |
| R26 | Less than detection limit |
| R27 | Unused code |
| R28 | Includes dilution factor |
| R29 | Sample relogged-in under a different work order |
| R30 | Equipment malfunction |
| R31 | Unused code |
| R32 | Unused code |
| R33 | Manual integration of qualifying ion only |
| R34 | Software split peak |
| R35 | Software included interfering peak |
| R37 | Peak area enhanced by software |
| R38 | Peak area excluded by software |
| R39 | Peak misidentification by software |
| R40 | Delete baseline noise |
| R41 | Unused code |
| R42 | Unused code |
| R43 | Unused code |
| R44 | Reanalysis due to the failure of an ISTD |
| R45 | Analysis didn't acquire |

# ANALYSIS METHOD

# TO15

*1100 NE Circle Blvd., Suite 300*
*Corvallis, OR 97330*
*Tel 541-768-3120 Fax 541-752-0276*

# CASE NARRATIVE
# GC/MS VOLATILES ANALYSIS

**Lab Name:** CH2M ASL **ASL SDG#:** Q3107

**Project:** 221 Sunset Drive **Project #:** 669272.16.01

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

**Method(s):**
TO15

# SAMPLE DATA SUMMARY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW100-SV-6.3-16.3-092816**

SDG No.: Q3107

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q310701

Lab File ID: Q310701dil2.D

Level: (LOW/MED) LOW

Date Received: 10/03/16

Date Analyzed: 10/04/16

Dilution Factor: 181.07

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 70.7 | 235 | 235 | U |
| 75-35-4 | 1,1-Dichloroethene | 110 | 365 | 365 | U |
| 75-09-2 | Methylene chloride | 96.1 | 3200 | 3200 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 110 | 365 | 365 | U |
| 75-34-3 | 1,1-Dichloroethane | 112 | 373 | 373 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 110 | 365 | 4680 | |
| 71-55-6 | 1,1,1-Trichloroethane | 151 | 502 | 502 | U |
| 79-01-6 | Trichloroethene (TCE) | 149 | 494 | 56300 | |
| 127-18-4 | Tetrachloroethene (PCE) | 188 | 624 | 624 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW101-SV-23.7-33.7-092816**

SDG No.: Q3107

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q310702

Lab File ID: Q310702dil.D

Level: (LOW/MED) LOW

Date Received: 10/03/16

Date Analyzed: 10/04/16

Dilution Factor: 314.38

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 123 | 408 | 460 | |
| 75-35-4 | 1,1-Dichloroethene | 190 | 633 | 633 | U |
| 75-09-2 | Methylene chloride | 167 | 5550 | 5550 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 190 | 633 | 4270 | |
| 75-34-3 | 1,1-Dichloroethane | 194 | 646 | 646 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 190 | 633 | 59300 | |
| 71-55-6 | 1,1,1-Trichloroethane | 262 | 871 | 871 | U |
| 79-01-6 | Trichloroethene (TCE) | 258 | 858 | 132000 | |
| 127-18-4 | Tetrachloroethene (PCE) | 326 | 1080 | 1080 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW105-SV-10.7-20.7-092916**

SDG No.: Q3107

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q310703

Lab File ID: Q310703dil.D

Level: (LOW/MED) LOW

Date Received: 10/03/16

Date Analyzed: 10/04/16

Dilution Factor: 2002

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 780 | 2600 | 2600 | U |
| 75-35-4 | 1,1-Dichloroethene | 1210 | 4030 | 4030 | U |
| 75-09-2 | Methylene chloride | 1060 | 35300 | 35300 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 1210 | 4030 | 1890 | J |
| 75-34-3 | 1,1-Dichloroethane | 1240 | 4120 | 4120 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 1210 | 4030 | 130000 | |
| 71-55-6 | 1,1,1-Trichloroethane | 1670 | 5550 | 5550 | U |
| 79-01-6 | Trichloroethene (TCE) | 1640 | 5460 | 726000 | |
| 127-18-4 | Tetrachloroethene (PCE) | 2070 | 6900 | 6900 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW103-SV-3.7-8.7-092916**

SDG No.: Q3107

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q310704

Lab File ID: Q310704dil.D

Level: (LOW/MED) LOW

Date Received: 10/03/16

Date Analyzed: 10/04/16

Dilution Factor: 23.5

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 9.18 | 30.7 | 30.7 | U |
| 75-35-4 | 1,1-Dichloroethene | 14.2 | 47.6 | 47.6 | U |
| 75-09-2 | Methylene chloride | 12.5 | 417 | 417 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 14.2 | 47.6 | 47.6 | U |
| 75-34-3 | 1,1-Dichloroethane | 14.5 | 48.6 | 48.6 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 14.2 | 47.6 | 42.3 | J |
| 71-55-6 | 1,1,1-Trichloroethane | 19.6 | 65.5 | 65.5 | U |
| 79-01-6 | Trichloroethene (TCE) | 19.3 | 64.5 | 7260 | |
| 127-18-4 | Tetrachloroethene (PCE) | 24.4 | 81.4 | 81.4 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW103-SV-3.7-8.7-092916-FD**

SDG No.: Q3107

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q310705

Lab File ID: Q310705dil.D

Level: (LOW/MED) LOW

Date Received: 10/03/16

Date Analyzed: 10/04/16

Dilution Factor: 23.63

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 9.20 | 30.7 | 30.7 | U |
| 75-35-4 | 1,1-Dichloroethene | 14.3 | 47.6 | 47.6 | U |
| 75-09-2 | Methylene chloride | 12.5 | 417 | 417 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 14.3 | 47.6 | 47.6 | U |
| 75-34-3 | 1,1-Dichloroethane | 14.6 | 48.6 | 48.6 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 14.3 | 47.6 | 28.7 | J |
| 71-55-6 | 1,1,1-Trichloroethane | 19.6 | 65.5 | 65.5 | U |
| 79-01-6 | Trichloroethene (TCE) | 19.3 | 64.5 | 7540 | |
| 127-18-4 | Tetrachloroethene (PCE) | 24.4 | 81.4 | 81.4 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW104-SV-3.7-5.7-092916**

SDG No.: Q3107

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q310706

Lab File ID: Q310706.D

Level: (LOW/MED) LOW

Date Received: 10/03/16

Date Analyzed: 10/03/16

Dilution Factor: 4.08

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 1.59 | 5.30 | 5.30 | U |
| 75-35-4 | 1,1-Dichloroethene | 2.47 | 8.23 | 8.23 | U |
| 75-09-2 | Methylene chloride | 2.16 | 72.1 | 72.1 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 2.47 | 8.23 | 8.23 | U |
| 75-34-3 | 1,1-Dichloroethane | 2.52 | 8.40 | 8.40 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 2.47 | 8.23 | 19.2 | |
| 71-55-6 | 1,1,1-Trichloroethane | 3.40 | 11.3 | 11.3 | U |
| 79-01-6 | Trichloroethene (TCE) | 3.34 | 11.1 | 150 | |
| 127-18-4 | Tetrachloroethene (PCE) | 4.22 | 14.1 | 14.1 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW107-SV-4.7-14.7-093016**

SDG No.: Q3107

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q310707

Lab File ID: Q310707.D

Level: (LOW/MED) LOW

Date Received: 10/03/16

Date Analyzed: 10/03/16

Dilution Factor: 4.24

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 1.65 | 5.51 | 5.51 | U |
| 75-35-4 | 1,1-Dichloroethene | 2.57 | 8.55 | 8.55 | U |
| 75-09-2 | Methylene chloride | 2.25 | 74.9 | 74.9 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 2.56 | 8.55 | 8.55 | U |
| 75-34-3 | 1,1-Dichloroethane | 2.62 | 8.73 | 8.73 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 2.56 | 8.55 | 8.55 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 3.53 | 11.8 | 11.8 | U |
| 79-01-6 | Trichloroethene (TCE) | 3.47 | 11.6 | 5.84 | J |
| 127-18-4 | Tetrachloroethene (PCE) | 4.39 | 14.6 | 14.6 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW113D-SV-16-21-100116**

SDG No.: Q3107

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q310708

Lab File ID: Q310708.D

Level: (LOW/MED) LOW

Date Received: 10/03/16

Date Analyzed: 10/03/16

Dilution Factor: 179.29

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 69.9 | 233 | 233 | U |
| 75-35-4 | 1,1-Dichloroethene | 108 | 361 | 361 | U |
| 75-09-2 | Methylene chloride | 95.1 | 3170 | 3170 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 108 | 361 | 361 | U |
| 75-34-3 | 1,1-Dichloroethane | 111 | 369 | 369 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 108 | 361 | 278 | J |
| 71-55-6 | 1,1,1-Trichloroethane | 149 | 497 | 497 | U |
| 79-01-6 | Trichloroethene (TCE) | 147 | 489 | 91800 | |
| 127-18-4 | Tetrachloroethene (PCE) | 186 | 618 | 618 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW113D-SV-16-21-100116D**

SDG No.: Q3107

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q310708D

Lab File ID: Q310708D.D

Level: (LOW/MED) LOW

Date Received: 10/03/16

Date Analyzed: 10/03/16

Dilution Factor: 179.29

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 69.9 | 233 | 233 | U |
| 75-35-4 | 1,1-Dichloroethene | 108 | 361 | 361 | U |
| 75-09-2 | Methylene chloride | 95.1 | 3170 | 3170 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 108 | 361 | 361 | U |
| 75-34-3 | 1,1-Dichloroethane | 111 | 369 | 369 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 108 | 361 | 243 | J |
| 71-55-6 | 1,1,1-Trichloroethane | 149 | 497 | 497 | U |
| 79-01-6 | Trichloroethene (TCE) | 147 | 489 | 87400 | |
| 127-18-4 | Tetrachloroethene (PCE) | 186 | 618 | 618 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**XB1-1003**

SDG No.: Q3107

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: XB1-1003

Lab File ID: XB1-1003.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 10/03/16

Dilution Factor: 1

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 0.390 | 1.30 | 1.30 | U |
| 75-35-4 | 1,1-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-09-2 | Methylene chloride | 0.530 | 17.7 | 17.7 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-34-3 | 1,1-Dichloroethane | 0.618 | 2.06 | 2.06 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 0.833 | 2.77 | 2.77 | U |
| 79-01-6 | Trichloroethene (TCE) | 0.819 | 2.73 | 2.73 | U |
| 127-18-4 | Tetrachloroethene (PCE) | 1.03 | 3.45 | 3.45 | U |

# QC SUMMARY

# AIR VOLATILE SURROGATE RECOVERY

SDG No.: Q3107 Lab Name: CH2M ASL

Analysis Method: TO15

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| | Field/QC Sample ID | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | # Out |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BS1X-1003 | 100 | 108 | | | | | | | | | | | |
| 2 | XB1-1003 | 98 | 97 | | | | | | | | | | | |
| 3 | MW104-SV-3.7-5.7-092916 | 98 | 101 | | | | | | | | | | | |
| 4 | MW107-SV-4.7-14.7-093016 | 98 | 103 | | | | | | | | | | | |
| 5 | MW113D-SV-16-21-100116 | 98 | 102 | | | | | | | | | | | |
| 6 | MW113D-SV-16-21-100116D | 98 | 102 | | | | | | | | | | | |
| 7 | MW100-SV-6.3-16.3-092816 | 99 | 96 | | | | | | | | | | | |
| 8 | MW101-SV-23.7-33.7-092816 | 97 | 96 | | | | | | | | | | | |
| 9 | MW105-SV-10.7-20.7-092916 | 99 | 94 | | | | | | | | | | | |
| 10 | MW103-SV-3.7-8.7-092916 | 97 | 97 | | | | | | | | | | | |
| 11 | MW103-SV-3.7-8.7-092916-F | 99 | 100 | | | | | | | | | | | |

* Values outside of QC limits

D Surrogate diluted out

| | | QC Limits |
|---|---|---|
| S1: | Toluene-d8 | (70-130) |
| S2: | 4-Bromofluorobenzene | (70-130) |

3C
AIR VOLATILE DUPLICATE SAMPLE SUMMARY

SDG No.: Q3107 Lab Name: CH2M ASL

Analysis Method: TO15 Concentration Units: UG/M3

Native Sample ID: MW113D-SV-16-21-100116

Duplicate Sample ID: MW113D-SV-16-21-100116D

| Analyte | Native Result | Duplicate Result | %RPD | QC Limits %RPD | Q |
|---|---|---|---|---|---|
| Vinyl Chloride | 233U | 233U | | 20 | NC |
| 1,1-Dichloroethene | 361U | 361U | | 20 | NC |
| Methylene chloride | 3170U | 3170U | | 20 | NC |
| trans-1,2-Dichloroethene | 361U | 361U | | 20 | NC |
| 1,1-Dichloroethane | 369U | 369U | | 20 | NC |
| cis-1,2-Dichloroethene | 278J | 243J | 13.44 | 20 | |
| 1,1,1-Trichloroethane | 497U | 497U | | 20 | NC |
| Trichloroethene (TCE) | 91800 | 87400 | 4.91 | 20 | |
| Tetrachloroethene (PCE) | 618U | 618U | | 20 | NC |

* Values outside of QC limits
NC RPD Value Not Calculated

Comments:

# AIR VOLATILE BLANK SPIKE RECOVERY

SDG No.: Q3107 Lab Name: CH2M ASL

Analysis Method: TO15 Blank Spike ID: BS1X-1003

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| Analyte | Spike Added (UG/M3) | BS Result (UG/M3) | %R | QC Limits %R | Q |
|---|---|---|---|---|---|
| Vinyl Chloride | 78.0 | 61.6 | 79 | 70-130 | |
| 1,1-Dichloroethene | 121 | 98.8 | 82 | 70-130 | |
| Methylene chloride | 106 | 89.0 | 84 | 70-130 | |
| 1,1-Dichloroethane | 124 | 99.2 | 80 | 70-130 | |
| cis-1,2-Dichloroethene | 121 | 102 | 84 | 70-130 | |
| 1,1,1-Trichloroethane | 167 | 137 | 82 | 70-130 | |
| Trichloroethene (TCE) | 164 | 143 | 87 | 70-130 | |
| Tetrachloroethene (PCE) | 207 | 179 | 87 | 70-130 | |
| trans-1,2-Dichloroethene | 121 | 105 | 87 | 70-130 | |

* Values outside of QC limits

Comments:

4A

AIR VOLATILE METHOD BLANK SUMMARY

Field Sample ID:

XB1-1003

SDG No.: Q3107

Lab Name: CH2M ASL

Analysis Method: TO15

Lab Sample ID: XB1-1003

Lab File ID: XB1-1003.D

Date Analyzed: 10/03/16

GC Column: ZB-624 ID: 0.25 (mm)

Time Analyzed: 1152

Instrument Name: MSAA

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | BS1X-1003 | BS1X-1003 | BS1X-1003.D | 10/03/16 | 1109 |
| 2 | MW104-SV-3.7-5.7-092916 | Q310706 | Q310706.D | 10/03/16 | 2133 |
| 3 | MW107-SV-4.7-14.7-093016 | Q310707 | Q310707.D | 10/03/16 | 2217 |
| 4 | MW113D-SV-16-21-100116 | Q310708 | Q310708.D | 10/03/16 | 2302 |
| 5 | MW113D-SV-16-21-100116D | Q310708D | Q310708D.D | 10/03/16 | 2346 |
| 6 | MW100-SV-6.3-16.3-092816 | Q310701 | Q310701dil2.D | 10/04/16 | 0030 |
| 7 | MW101-SV-23.7-33.7-092816 | Q310702 | Q310702dil.D | 10/04/16 | 0114 |
| 8 | MW105-SV-10.7-20.7-092916 | Q310703 | Q310703dil.D | 10/04/16 | 0157 |
| 9 | MW103-SV-3.7-8.7-092916 | Q310704 | Q310704dil.D | 10/04/16 | 0543 |
| 10 | MW103-SV-3.7-8.7-092916-FD | Q310705 | Q310705dil.D | 10/04/16 | 0627 |

Comments:

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3107 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 08/26/16

Lab File ID: T1-0826.D BFB Injection Time: 1532

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | | Q |
|---|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 35016 | (20.4) | |
| 75 | 30% to 60% of mass 95 | 82680 | (48.2) | |
| 95 | base peak, 100% relative abundance | 171648 | (100.0) | |
| 96 | 5% to 9% of mass 95 | 10400 | (6.1) | |
| 173 | 0% to less than 2% of mass 174 | 1199 | (0.8) | |
| 174 | greater than 50% of mass 95 | 146240 | (85.2) | |
| 175 | 5% to 9% of mass 174 | 11159 | (7.6) | |
| 176 | >95%, but <101% of mass 174 | 146752 | (100.4) | |
| 177 | 5% to 9% of mass 176 | 8963 | (6.1) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | LEVEL5 | LEVEL5 | LEVEL5.D | 08/26/16 | 1532 |
| 2 | LEVEL6 | LEVEL6 | LEVEL6.D | 08/26/16 | 1615 |
| 3 | LEVEL7 | LEVEL7 | LEVEL7.D | 08/26/16 | 1658 |
| 4 | LEVEL4 | LEVEL4 | LEVEL4.D | 08/26/16 | 1741 |
| 5 | LEVEL3 | LEVEL3 | LEVEL3.D | 08/26/16 | 1824 |
| 6 | LEVEL2 | LEVEL2 | LEVEL2.D | 08/26/16 | 1906 |
| 7 | LEVEL1 | LEVEL1 | LEVEL1.D | 08/26/16 | 1949 |
| 8 | ICV-0826 | ICV-0826 | ICV-0826.D | 08/26/16 | 2032 |

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3107 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 10/03/16

Lab File ID: T1-1003.D BFB Injection Time: 1026

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | | Q |
|---|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 52976 | (20.9) | |
| 75 | 30% to 60% of mass 95 | 123936 | (48.8) | |
| 95 | base peak, 100% relative abundance | 254016 | (100.0) | |
| 96 | 5% to 9% of mass 95 | 15906 | (6.3) | |
| 173 | 0% to less than 2% of mass 174 | 1993 | (0.9) | |
| 174 | greater than 50% of mass 95 | 217344 | (85.6) | |
| 175 | 5% to 9% of mass 174 | 17160 | (7.9) | |
| 176 | >95%, but <101% of mass 174 | 218956 | (100.7) | |
| 177 | 5% to 9% of mass 176 | 14484 | (6.6) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | CV1-1003 | CV1-1003 | CV1-1003.D | 10/03/16 | 1026 |
| 2 | BS1X-1003 | BS1X-1003 | BS1X-1003.D | 10/03/16 | 1109 |
| 3 | XB1-1003 | XB1-1003 | XB1-1003.D | 10/03/16 | 1152 |
| 4 | MW104-SV-3.7-5.7-092916 | Q310706 | Q310706.D | 10/03/16 | 2133 |
| 5 | MW107-SV-4.7-14.7-093016 | Q310707 | Q310707.D | 10/03/16 | 2217 |
| 6 | MW113D-SV-16-21-100116 | Q310708 | Q310708.D | 10/03/16 | 2302 |
| 7 | MW113D-SV-16-21-100116D | Q310708D | Q310708D.D | 10/03/16 | 2346 |
| 8 | MW100-SV-6.3-16.3-092816 | Q310701 | Q310701dil2.D | 10/04/16 | 0030 |
| 9 | MW101-SV-23.7-33.7-092816 | Q310702 | Q310702dil.D | 10/04/16 | 0114 |
| 10 | MW105-SV-10.7-20.7-092916 | Q310703 | Q310703dil.D | 10/04/16 | 0157 |
| 11 | MW103-SV-3.7-8.7-092916 | Q310704 | Q310704dil.D | 10/04/16 | 0543 |
| 12 | MW103-SV-3.7-8.7-092916-FD | Q310705 | Q310705dil.D | 10/04/16 | 0627 |

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3107

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N) N

Concentration Units: ppbv

| ICAL Sample IDs: | LEVEL1 | LEVEL2 | LEVEL3 | LEVEL4 | LEVEL5 | LEVEL6 |
|---|---|---|---|---|---|---|
| ICAL File IDs: | LEVEL1.D | LEVEL2.D | LEVEL3.D | LEVEL4.D | LEVEL5.D | LEVEL6.D |

| Analyte | Std 1 | RF 1 | Std 2 | RF 2 | Std 3 | RF 3 | Std 4 | RF 4 | Std 5 | RF 5 | Std 6 | RF 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Vinyl Chloride | .5 | 0.793 | 1 | 0.925 | 5 | 0.831 | 20 | 0.673 | 30 | 0.697 | 50 | 0.680 |
| 1,1-Dichloroethene | .5 | 1.422 | 1 | 1.506 | 5 | 1.326 | 20 | 1.178 | 30 | 1.207 | 50 | 1.183 |
| Methylene chloride | .5 | 1.213 | 1 | 1.225 | 5 | 0.944 | 20 | 0.829 | 30 | 0.865 | 50 | 0.861 |
| trans-1,2-Dichloroethene | .5 | 0.950 | 1 | 1.156 | 5 | 1.104 | 20 | 1.040 | 30 | 1.098 | 50 | 1.090 |
| 1,1-Dichloroethane | .5 | 1.609 | 1 | 1.659 | 5 | 1.370 | 20 | 1.280 | 30 | 1.321 | 50 | 1.304 |
| cis-1,2-Dichloroethene | .5 | 1.031 | 1 | 1.148 | 5 | 1.010 | 20 | 0.960 | 30 | 1.003 | 50 | 0.997 |
| 1,1,1-Trichloroethane | .5 | 2.416 | 1 | 2.480 | 5 | 2.023 | 20 | 1.755 | 30 | 1.847 | 50 | 1.813 |
| 1,4-difluorobenzene | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Trichloroethene (TCE) | .5 | 0.321 | 1 | 0.296 | 5 | 0.283 | 20 | 0.248 | 30 | 0.252 | 50 | 0.250 |
| Toluene-d8 | 10 | 0.903 | 10 | 0.903 | 10 | 0.897 | 10 | 0.900 | 10 | 0.897 | 10 | 0.913 |
| Tetrachloroethene (PCE) | .5 | 0.472 | 1 | 0.447 | 5 | 0.431 | 20 | 0.363 | 30 | 0.364 | 50 | 0.359 |
| Chlorobenzene-d5 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| 4-Bromofluorobenzene | 10 | 0.465 | 10 | 0.484 | 10 | 0.504 | 10 | 0.514 | 10 | 0.513 | 10 | 0.525 |

@ SPCC # CCC

# VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3107

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N) N

Concentration Units: ppbv

ICAL Sample IDs: LEVEL7

ICAL File IDs: LEVEL7.D

| Analyte | Std 7 | RF 7 | Std 8 | RF 8 | Std 9 | RF 9 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | | | | | | | | | | |
| Vinyl Chloride | 100 | 0.658 | | | | | | | | | | |
| 1,1-Dichloroethene | 100 | 1.120 | | | | | | | | | | |
| Methylene chloride | 100 | 0.838 | | | | | | | | | | |
| trans-1,2-Dichloroethene | 100 | 1.063 | | | | | | | | | | |
| 1,1-Dichloroethane | 100 | 1.272 | | | | | | | | | | |
| cis-1,2-Dichloroethene | 100 | 0.955 | | | | | | | | | | |
| 1,1,1-Trichloroethane | 100 | 1.747 | | | | | | | | | | |
| 1,4-difluorobenzene | 10 | 1.000 | | | | | | | | | | |
| Trichloroethene (TCE) | 100 | 0.240 | | | | | | | | | | |
| Toluene-d8 | 10 | 0.904 | | | | | | | | | | |
| Tetrachloroethene (PCE) | 100 | 0.340 | | | | | | | | | | |
| Chlorobenzene-d5 | 10 | 1.000 | | | | | | | | | | |
| 4-Bromofluorobenzene | 10 | 0.533 | | | | | | | | | | |

@ SPCC # CCC

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3107

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N)N

Concentration Units: ppbv

| Analyte | Curve Type | Avg. RF | %RSD | r | COD | Q |
|---|---|---|---|---|---|---|
| Bromochloromethane | AVG | 1.000 | 0.00 | | | |
| Vinyl Chloride | AVG | 0.751 | 13.4 | | | |
| 1,1-Dichloroethene | AVG | 1.277 | 11.3 | | | |
| Methylene chloride | LINR | 0.968 | | 0.999 | | |
| trans-1,2-Dichloroethene | AVG | 1.072 | 6.05 | | | |
| 1,1-Dichloroethane | AVG | 1.402 | 11.6 | | | |
| cis-1,2-Dichloroethene | AVG | 1.015 | 6.37 | | | |
| 1,1,1-Trichloroethane | AVG | 2.011 | 15.5 | | | |
| 1,4-difluorobenzene | AVG | 1.000 | 0.00 | | | |
| Trichloroethene (TCE) | AVG | 0.270 | 11.2 | | | |
| Toluene-d8 | AVG | 0.902 | 0.61 | | | |
| Tetrachloroethene (PCE) | AVG | 0.396 | 13.1 | | | |
| Chlorobenzene-d5 | AVG | 1.000 | 0.00 | | | |
| 4-Bromofluorobenzene | AVG | 0.505 | 4.69 | | | |

@ SPCC # CCC

# VOLATILE INITIAL CALIBRATION CHECK

SDG No.: Q3107

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 08/26/16 2032

Instrument ID: MSAA

Init. Calib. Date(s): 08/26/16 08/26/16

2nd Source ICV-0826

Init. Calib. Time(s): 1532 1949

Lab File ID: ICV-0826.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 29.6 | 0.741 | 0.000 | -1 | 30 | |
| 1,1-Dichloroethene | 30.0 | 30.4 | 1.296 | 0.000 | 1 | 30 | |
| Methylene chloride | 30.0 | 33.9 | 0.961 | 0.000 | 13 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 30.5 | 1.090 | 0.000 | 2 | 30 | |
| 1,1-Dichloroethane | 30.0 | 28.8 | 1.348 | 0.000 | -4 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 32.4 | 1.095 | 0.000 | 8 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 29.4 | 1.974 | 0.000 | -2 | 30 | |
| Trichloroethene (TCE) | 30.0 | 29.7 | 0.267 | 0.000 | -1 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 28.7 | 0.379 | 0.000 | -4 | 30 | |

* SPCC # CCC

# VOLATILE CONTINUING CALIBRATION CHECK

SDG No.: Q3107

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 10/03/16 1026

Instrument ID: MSAA

Init. Calib. Date(s): 08/26/16 08/26/16

Cal Check ID: CV1-1003

Init. Calib. Time(s): 1532 1949

Lab File ID: CV1-1003.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 24.2 | 0.606 | 0.000 | -19 | 30 | |
| 1,1-Dichloroethene | 30.0 | 25.4 | 1.079 | 0.000 | -16 | 30 | |
| Methylene chloride | 30.0 | 26.2 | 0.745 | 0.000 | -13 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 26.7 | 0.954 | 0.000 | -11 | 30 | |
| 1,1-Dichloroethane | 30.0 | 24.7 | 1.154 | 0.000 | -18 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 26.0 | 0.879 | 0.000 | -13 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 25.2 | 1.692 | 0.000 | -16 | 30 | |
| Trichloroethene (TCE) | 30.0 | 25.9 | 0.233 | 0.000 | -14 | 30 | |
| Toluene-d8 | 10.0 | 9.93 | 0.896 | 0.000 | -0.7 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 25.6 | 0.338 | 0.000 | -15 | 30 | |
| 4-Bromofluorobenzene | 10.0 | 11.2 | 0.564 | 0.000 | 12 | 30 | |

* SPCC # CCC

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3107

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: LEVEL5 | Date Analyzed: 08/26/16

Lab File ID: LEVEL5.D | Time Analyzed: 1532

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 291021 | 14.62 | 1203115 | 16.29 | 987506 | 20.57 |
| | Upper Limit | 407429 | 15.12 | 1684361 | 16.79 | 1382508 | 21.07 |
| | Lower Limit | 174613 | 14.12 | 721869 | 15.79 | 592504 | 20.07 |
| Field Sample ID | Lab Sample ID | | | | | | |
| ICV-0826 | ICV-0826 | 290536 | 14.62 | 1157423 | 16.3 | 971840 | 20.57 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3107

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: CV1-1003 | Date Analyzed: 10/03/16

Lab File ID: CV1-1003.D | Time Analyzed: 1026

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 243021 | 14.61 | 1002930 | 16.29 | 865196 | 20.57 |
| | Upper Limit | 340229 | 15.11 | 1404102 | 16.79 | 1211274 | 21.07 |
| | Lower Limit | 145813 | 14.11 | 601758 | 15.79 | 519118 | 20.07 |
| Field Sample ID | Lab Sample ID | | | | | | |
| BS1X-1003 | BS1X-1003 | 252120 | 14.61 | 1026146 | 16.29 | 894124 | 20.56 |
| XB1-1003 | XB1-1003 | 250867 | 14.60 | 989321 | 16.28 | 833816 | 20.56 |
| MW104-SV-3.7-5.7-092 | Q310706 | 198463 | 14.60 | 790330 | 16.28 | 689377 | 20.56 |
| MW107-SV-4.7-14.7-09 | Q310707 | 175173 | 14.60 | 774470 | 16.28 | 660365 | 20.56 |
| MW113D-SV-16-21-1001 | Q310708 | 173395 | 14.60 | 789493 | 16.28 | 697010 | 20.56 |
| MW113D-SV-16-21-1001 | Q310708D | 199799 | 14.60 | 796779 | 16.28 | 706446 | 20.56 |
| MW100-SV-6.3-16.3-09 | Q310701 | 202249 | 14.60 | 791391 | 16.28 | 670746 | 20.56 |
| MW101-SV-23.7-33.7-0 | Q310702 | 192930 | 14.60 | 788531 | 16.28 | 651115 | 20.56 |
| MW105-SV-10.7-20.7-0 | Q310703 | 175951 | 14.60 | 753161 | 16.28 | 634822 | 20.56 |
| MW103-SV-3.7-8.7-092 | Q310704 | 190359 | 14.59 | 790108 | 16.27 | 662382 | 20.56 |
| MW103-SV-3.7-8.7-092 | Q310705 | 184657 | 14.60 | 748102 | 16.28 | 637100 | 20.56 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

# CHAIN OF CUSTODY/SHIPPING DOCUMENTS

Q 3107

ch2m

12750 Merit Drive Suite 1100
Dallas, TX
Tel No: (352) 384-7002
Fax No: (352) 214-2814

# CHAIN-OF-CUSTODY RECORD

COC NUMBER: 66927

| | | | | |
|---|---|---|---|---|
| PROJECT NAME: 221 Sunset Drive | PROJECT NUMBER: 669272.16.01 | LAB NAME AND CONTACT: Applied Sciences Lab, Kathy McKinley, Lab PM | FAX AND MAIL REPORTS ESD TO: RECIPIENT 1 (Name and Company): Amy Klopper/CH2M, amy.klopper@ch2m.com | RECIPIENT 2 (Address, Tel No., and Fax No.): |
| PROJECT PHASE/SITE/TASK: Residential VI Sampling 2016 | CTO OR DO NUMBER: | LAB PO NUMBER: NA | FAX AND MAIL REPORTS ESD TO: RECIPIENT 2 (Name and Company): Barrie Selcoe/CH2M, barrie.selcoe@ch2m.com | RECIPIENT 3 (Address, Tel No., and Fax No.): Monica Schneider/CH2M, monica.schneider@ch2m.com |
| PROJECT CONTACT: Kimberly Stokes | PROJECT TEL NO AND FAX NO: Phone: 214-998-4839 | LAB TEL NO AND FAX NO: Phone: 541-768-3144 | FAX AND MAIL REPORTS ESD TO: RECIPIENT 3 (Name and Company): Kimberly Stokes/CH2M | RECIPIENT 4 (Address, Tel No., and Fax No.): email |

| 17 ITEM | 18 SAMPLE ID | 20 MATRIX (see codes on SOP) | 21 DATE AND TIME START | 22 DATE AND TIME STOP | 23 CANISTER VACUUM IN FIELD, HG (START) | 23 CANISTER VACUUM IN FIELD, HG (STOP) | FLOW CONTROLLER ID | CANISTER ID | 23 DATA PKG LEVEL (see codes on SOP) | 24 TAT (calendar days) | TO-15 Scan | TO-15 SIM | 26 SAMPLE TYPE (see codes on SOP) | 27 LAB ID (for lab's use) | 28 COMMENTS/ SCREENING READINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MD-MW100-092816 | SV | 9/28/2016 12:58 | 9/28/2016 13:03 | -28.93 | -7.91 | FC3005B | SG1683 | | 24 TAT (calendar days) | X | | | | |
| 2 | MD-MW101-092816 | SV | 9/28/2016 14:31 | 9/28/2016 14:36 | -28.91 | -5.44 | FC3910B | SG1353 | | 24 ~~30 TAT~~ (calendar days) KR | X | | | | |
| 3 | MD-MW105-092916 | SV | 9/29/2016 11:26 | 9/29/2016 11:31 | -29.03 | -1.61 | FC3902B | SG1832 | | 24 ~~30 TAT~~ (calendar days) | X | | | | |
| 4 | MD-MW103-092916 | SV | 9/29/2016 14:03 | 9/29/2016 14:13 | -29.22 | -3.13 | FC3954B | SG1760 | | 24 ~~30 TAT~~ (calendar days) | X | | | | |
| 5 | MD-MW103-D-092816 | SV | 9/29/2016 14:03 | 9/29/2016 14:13 | -29.17 | -3.45 | FC3954B | SG1885 | | 24 ~~30 TAT~~ (calendar days) | X | | | | |
| 6 | MD-MW104-092916 | SV | 9/29/2016 16:39 | 9/29/2016 16:44 | -29.15 | -5.31 | FC3956B | SG1895 | | 24 ~~30 TAT~~ (calendar days) | X | | | | |
| 7 | MD-MW105-093016 | SV | 9/30/2016 9:31 | 9/30/2016 9:36 | -29.04 | -5.71 | FC3952B | SG1821 | | 24 ~~30 TAT~~ (calendar days) | X | | | | |
| 8 | MD-MW113D-100116 | SV | 10/1/16 0835 | 10/1/16 0840 | -28.99 | -3.77 | FC3001B | SG1671 | | 24 TAT | X | | | | |
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| 29 | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | |

1 2 3 4 5 6 7 8

SAMPLER(S) AND COMPANY: (please print) Katie Rabe / CH2M

FedEX number & Special Instructions: Select VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, methylene chloride, PCE, TCE, and vinyl chloride)

SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use): 23.1°C

| RELINQUISHED BY | DATE | TIME | RECEIVED BY | DATE | TIME |
|---|---|---|---|---|---|
| Printed Name and Signature: K. Rabe, Tina Wardman K. Rabe | 10/1/16 10/3/16 | 0850 1310 | Russell Southard | 10/3/16 | 1315 |

Distribution: [ 4 ] Original - Laboratory (To be returned with Analytical Report) [ ] Copy 1 - Project File [ ] Copy 2 - PMO

Form CC001, Rev 06/00

# CH2M Applied Sciences Laboratory

## Sample Receipt Record

SDG ID: Q3107 Date Received: 10/3/2016

Client/Project: 221 Sunset Received by: KJM

| | | | |
|---|---|---|---|
| Were custody seals intact and on the outside of the cooler? | ☑ Yes | ☐ No | ☐ N/A |
| Shipping Record: | ☐ Hand Delivered | ☑ On File | ☐ COC |
| Radiological Screening for DoD | ☐ Yes | ☐ No | ☑ N/A |
| Packing Material: | ☐ Hand Delivered | ☐ Ice ☐ Blue Ice | ☑ Box |
| Temp OK? (<6C) Therm ID: TH173 Exp. °C | ☐ Yes | ☐ No | ☑ N/A |
| Was a Chain of Custody (CoC) Provided? | ☑ Yes | ☐ No | ☐ N/A |
| Was the CoC correctly filled out (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did sample labels agree with COC? (If No, document below) | ☐ Yes | ☑ No | ☐ N/A |
| Did the CoC list a correct bottle count and the preservative types (No=Correct on CoC) | ☑ Yes | ☐ No | ☐ N/A |
| Were the sample containers in good condition (not broken or leaking)? | ☑ Yes | ☐ No | ☐ N/A |
| Was enough sample volume provided for analysis? (If No, document below) | ☐ Yes | ☐ No | ☑ N/A |
| Containers supplied by ASL? | ☑ Yes | ☐ No | ☐ N/A |
| Any sample with < 1/2 holding time remaining? If so contact LPM and document below. | ☐ Yes | ☑ No | ☐ N/A |
| Samples have multi-phase? If yes, document on SRER | ☐ Yes | ☐ No | ☑ N/A |
| All water VOCs free of air bubbles? No, document on SRER | ☐ Yes | ☐ No | ☑ N/A |
| pH of all samples met criteria on receipt? If "No", preserve and document below. | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals filtered in the field? | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals have sediment in bottom of container? If so document below. | ☐ Yes | ☐ No | ☑ N/A |

### Preservation Adjustment

| Sample ID | Reagent | Reagent Lot Number | Volume Added | Initials/Time | 24 hour pH check Initials/Time |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

Did pH of all metals samples preserved upon receipt meet criteria 24 hours after preservation? ☐ Yes ☐ No

### Sample Exception Report (The following exceptions were noted)

Sample Q3107-05. COC ID date 0928, but sample data is 0929. Logged in as MD-MW103-D-092916
Sample Q3107-07. COC ID MW-107, Canister ID MW-107. Logged in using COC ID.

Client was notified on: 10/3/16 Client contact: Kim Stokes

Resolution to Exception:

**CH2M Applied Sciences Laboratory (ASL)**

1100 NE Circle Blvd, Suite 300, Corvallis, OR 97330

**Tel 541.768.3120** Email: asl@ch2m.com

# Amended Report

| | | | |
|---|---|---|---|
| Date: | 12/29/16 | Client: | 221 Sunset |
| SDG No.: | Q3141 | Project/Task: | |
| Revision No.: | 1 | Completed by: | CH |
| Affected Method(s): | TO-15 SCAN | Approved by: | KJM |

**Amendment(s) Completed and Reason(s):**

Client requested change of Field IDs

**Amendment(s) Justification:**

| | |
|---|---|
| | Reporting error |
| | Calculation error |
| | Missing information/data |
| | Wrong information/data |
| | Analytical problem/correction |
| X | Client change/request |
| | Subcontracted laboratory error |
| | Other (define) |

**Edata Required:**

| | |
|---|---|
| X | Yes |
| | No |

# Analytical Report for

# 221 Sunset Drive - Residential VI Sampling 2016

## ASL Report #: Q3141
## Project ID: 669272.16.01

**Attn: Kimberly Stokes**

Authorized and Released By:

Kathy McKinley

Laboratory Project Manager
Kathy McKinley
*(541) 758-0235 ext.23144*
*December 29, 2016*

All analyses performed by CH2M HILL are clearly indicated. Any subcontracted analyses are included as appended reports as received from the subcontracted laboratory. The results included in this report only relate to the samples listed on the following Sample Cross-Reference page. This report shall not be reproduced except in full, without the written approval of the laboratory.

Any unusual difficulties encountered during the analysis of your samples are discussed in the attached case narratives.

Accredited in accordance with NELAP:
Oregon (100022)
Louisiana (05031)

CH2M – Applied Sciences Laboratory
1100 NE Circle Boulevard, Suite 300
Corvallis, Oregon 97330 Email: asl@ch2m.com
www.ch2m.com

**ASL Report #: Q3141**

## Sample Receipt Comments

We certify that the test results meet all NELAP requirements.

## Sample Cross-Reference

| ASL Sample ID | Client Sample ID | Date/Time Collected | Date Received |
|---|---|---|---|
| Q314101 | MW114D-SV-20-30-100216 | 10/02/16 15:03 | 10/05/16 |
| Q314102 | MW114S-SV-8-18-100216 | 10/02/16 16:07 | 10/05/16 |
| Q314103 | MW113S-SV-7-12-100316 | 10/03/16 11:12 | 10/05/16 |
| Q314104 | MW109D-SV-16-26-100316 | 10/03/16 12:10 | 10/05/16 |
| Q314105 | MW109S-SV-5-10-100316 | 10/03/16 12:50 | 10/05/16 |

## Table of Contents

**Page**

Volatile Organics Analysis by Method TO-15 ..... 6

Chain of Custody/Shipping Documents..... 30

## Data Qualifiers

| | |
|---|---|
| U | The analyte was not detected and is reported as less than the quantitation (or detection) limit. |
| J | The analyte was positively identified and is reported as an estimated value below the quantitation limit. |
| E | The analyte was positively identified and the reported result exceeded the instrument calibration range. |
| B | Blank contamination—the reported result is associated with a contaminated blank. |
| M | A matrix effect was present. |
| R | The data must be evaluated for usability due to deficiencies in the ability to analyze the sample and meet QC criteria. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain QC criteria. |
| P | The primary and confirmation analyte result recoveries do not match (dual column analysis). |

CH2MHILL
Applied Sciences Laboratory (ASL)

# Applied Sciences Group QC Codes for Raw Data Mark Up

| Code | Description |
|---|---|
| R01 | Illegible entry |
| R02 | Unnecessary entry |
| R03 | Typo |
| R04 | Misspelled |
| R05 | Page mis-numbered |
| R06 | Transcription error or incorrect entry |
| R07 | Rounding error |
| R08 | Unused code |
| R09 | Unused code |
| R10 | Wrong date entered |
| R11 | Wrong sample number |
| R12 | Wrong dilution factor |
| R13 | Wrong concentration |
| R14 | Wrong batch number |
| R15 | Wrong standard concentration |
| R16 | Wrong standard lot # |
| R17 | Remake of standards |
| R18 | Unused code |
| R19 | Unused code |
| R20 | Re-calibration of equipment |
| R21 | Sample rerun |
| R22 | Miscalculation |
| R23 | Wrong detection limit given |
| R24 | Less than reporting limit |
| R25 | Non-target compound |
| R26 | Less than detection limit |
| R27 | Unused code |
| R28 | Includes dilution factor |
| R29 | Sample relogged-in under a different work order |
| R30 | Equipment malfunction |
| R31 | Unused code |
| R32 | Unused code |
| R33 | Manual integration of qualifying ion only |
| R34 | Software split peak |
| R35 | Software included interfering peak |
| R37 | Peak area enhanced by software |
| R38 | Peak area excluded by software |
| R39 | Peak misidentification by software |
| R40 | Delete baseline noise |
| R41 | Unused code |
| R42 | Unused code |
| R43 | Unused code |
| R44 | Reanalysis due to the failure of an ISTD |
| R45 | Analysis didn't acquire |

# ANALYSIS METHOD

# TO15

*1100 NE Circle Blvd., Suite 300*
*Corvallis, OR 97330*
*Tel 541-768-3120 Fax 541-752-0276*

# CASE NARRATIVE
# GC/MS VOLATILES ANALYSIS

**Lab Name:** CH2M ASL **ASL SDG#:** Q3141

**Project:** 221 Sunset Drive **Project #:** 669272.16.01

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

**Method(s):**
TO15

# SAMPLE DATA SUMMARY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW114D-SV-20-30-100216**

SDG No.: Q3141

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q314101

Lab File ID: Q314101.D

Level: (LOW/MED) LOW

Date Received: 10/05/16

Date Analyzed: 10/05/16

Dilution Factor: 1058.33

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 413 | 1380 | 1380 | U |
| 75-35-4 | 1,1-Dichloroethene | 641 | 2130 | 2130 | U |
| 75-09-2 | Methylene chloride | 562 | 18700 | 18700 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 641 | 2130 | 2130 | U |
| 75-34-3 | 1,1-Dichloroethane | 655 | 2180 | 2180 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 641 | 2130 | 1540 | J |
| 71-55-6 | 1,1,1-Trichloroethane | 882 | 2940 | 2940 | U |
| 79-01-6 | Trichloroethene (TCE) | 868 | 2890 | 360000 | |
| 127-18-4 | Tetrachloroethene (PCE) | 1100 | 3650 | 3650 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW114S-SV-8-18-100216**

SDG No.: Q3141

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q314102

Lab File ID: Q314102D.D

Level: (LOW/MED) LOW

Date Received: 10/05/16

Date Analyzed: 10/06/16

Dilution Factor: 125

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 48.9 | 163 | 163 | U |
| 75-35-4 | 1,1-Dichloroethene | 75.8 | 252 | 252 | U |
| 75-09-2 | Methylene chloride | 66.4 | 2210 | 2210 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 75.8 | 252 | 252 | U |
| 75-34-3 | 1,1-Dichloroethane | 77.4 | 257 | 257 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 75.8 | 252 | 252 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 104 | 347 | 347 | U |
| 79-01-6 | Trichloroethene (TCE) | 103 | 341 | 49500 | |
| 127-18-4 | Tetrachloroethene (PCE) | 130 | 431 | 431 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW113S-SV-7-12-100316**

SDG No.: Q3141

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q314103

Lab File ID: Q314103.D

Level: (LOW/MED) LOW

Date Received: 10/05/16

Date Analyzed: 10/05/16

Dilution Factor: 787.5

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 307 | 1020 | 1020 | U |
| 75-35-4 | 1,1-Dichloroethene | 476 | 1590 | 1590 | U |
| 75-09-2 | Methylene chloride | 417 | 13900 | 13900 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 476 | 1590 | 1590 | U |
| 75-34-3 | 1,1-Dichloroethane | 486 | 1620 | 1620 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 476 | 1590 | 1590 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 655 | 2190 | 2190 | U |
| 79-01-6 | Trichloroethene (TCE) | 645 | 2150 | 255000 | |
| 127-18-4 | Tetrachloroethene (PCE) | 814 | 2720 | 2720 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW109D-SV-16-26-100316**

SDG No.: Q3141

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q314104

Lab File ID: Q314104.D

Level: (LOW/MED) LOW

Date Received: 10/05/16

Date Analyzed: 10/05/16

Dilution Factor: 2010

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 785 | 2630 | 2630 | U |
| 75-35-4 | 1,1-Dichloroethene | 1220 | 4070 | 4070 | U |
| 75-09-2 | Methylene chloride | 1070 | 35700 | 35700 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 1220 | 4070 | 4070 | U |
| 75-34-3 | 1,1-Dichloroethane | 1240 | 4160 | 4160 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 1220 | 4070 | 1380 | J |
| 71-55-6 | 1,1,1-Trichloroethane | 1680 | 5610 | 5610 | U |
| 79-01-6 | Trichloroethene (TCE) | 1650 | 5520 | 447000 | |
| 127-18-4 | Tetrachloroethene (PCE) | 2080 | 6970 | 6970 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW109S-SV-5-10-100316**

SDG No.: Q3141

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q314105

Lab File ID: Q314105.D

Level: (LOW/MED) LOW

Date Received: 10/05/16

Date Analyzed: 10/05/16

Dilution Factor: 27.38

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 10.7 | 35.6 | 35.6 | U |
| 75-35-4 | 1,1-Dichloroethene | 16.6 | 55.3 | 55.3 | U |
| 75-09-2 | Methylene chloride | 14.5 | 484 | 484 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 16.6 | 55.3 | 55.3 | U |
| 75-34-3 | 1,1-Dichloroethane | 16.9 | 56.4 | 56.4 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 16.6 | 55.3 | 24.3 | J |
| 71-55-6 | 1,1,1-Trichloroethane | 22.8 | 76.0 | 76.0 | U |
| 79-01-6 | Trichloroethene (TCE) | 22.4 | 74.8 | 2800 | |
| 127-18-4 | Tetrachloroethene (PCE) | 28.4 | 94.5 | 94.5 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW109S-SV-5-10-100316D**

SDG No.: Q3141

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q314105D

Lab File ID: Q314105D.D

Level: (LOW/MED) LOW

Date Received: 10/05/16

Date Analyzed: 10/05/16

Dilution Factor: 27.38

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 10.7 | 35.6 | 35.6 | U |
| 75-35-4 | 1,1-Dichloroethene | 16.6 | 55.3 | 55.3 | U |
| 75-09-2 | Methylene chloride | 14.5 | 484 | 484 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 16.6 | 55.3 | 55.3 | U |
| 75-34-3 | 1,1-Dichloroethane | 16.9 | 56.4 | 56.4 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 16.6 | 55.3 | 20.4 | J |
| 71-55-6 | 1,1,1-Trichloroethane | 22.8 | 76.0 | 76.0 | U |
| 79-01-6 | Trichloroethene (TCE) | 22.4 | 74.8 | 2720 | |
| 127-18-4 | Tetrachloroethene (PCE) | 28.4 | 94.5 | 94.5 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**XB1-1005**

SDG No.: Q3141

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: XB1-1005

Lab File ID: XB1-1005.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 10/05/16

Dilution Factor: 1

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 0.390 | 1.30 | 1.30 | U |
| 75-35-4 | 1,1-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-09-2 | Methylene chloride | 0.530 | 17.7 | 17.7 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-34-3 | 1,1-Dichloroethane | 0.618 | 2.06 | 2.06 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 0.833 | 2.77 | 2.77 | U |
| 79-01-6 | Trichloroethene (TCE) | 0.819 | 2.73 | 2.73 | U |
| 127-18-4 | Tetrachloroethene (PCE) | 1.03 | 3.45 | 3.45 | U |

# QC SUMMARY

# AIR VOLATILE SURROGATE RECOVERY

SDG No.: Q3141 Lab Name: CH2M ASL

Analysis Method: TO15

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| | Field/QC Sample ID | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | # Out |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BS1X-1005 | 101 | 118 | | | | | | | | | | | |
| 2 | XB1-1005 | 100 | 104 | | | | | | | | | | | |
| 3 | MW114D-SV-20-30-100216 | 100 | 104 | | | | | | | | | | | |
| 4 | MW113S-SV-7-12-100316 | 101 | 99 | | | | | | | | | | | |
| 5 | MW109D-SV-16-26-100316 | 94 | 104 | | | | | | | | | | | |
| 6 | MW109S-SV-5-10-100316 | 99 | 108 | | | | | | | | | | | |
| 7 | MW109S-SV-5-10-100316D | 100 | 108 | | | | | | | | | | | |
| 8 | MW114S-SV-8-18-100216 | 101 | 101 | | | | | | | | | | | |

* Values outside of QC limits
D Surrogate diluted out

| | | QC Limits |
|---|---|---|
| S1: | Toluene-d8 | (70-130) |
| S2: | 4-Bromofluorobenzene | (70-130) |

3C
AIR VOLATILE DUPLICATE SAMPLE SUMMARY

SDG No.: Q3141 Lab Name: CH2M ASL

Analysis Method: TO15 Concentration Units: UG/M3

Native Sample ID: MW109S-SV-5-10-100316

Duplicate Sample ID: MW109S-SV-5-10-100316D

| Analyte | Native Result | Duplicate Result | %RPD | QC Limits %RPD | Q |
|---|---|---|---|---|---|
| Vinyl Chloride | 35.6U | 35.6U | | 20 | NC |
| 1,1-Dichloroethene | 55.3U | 55.3U | | 20 | NC |
| Methylene chloride | 484U | 484U | | 20 | NC |
| trans-1,2-Dichloroethene | 55.3U | 55.3U | | 20 | NC |
| 1,1-Dichloroethane | 56.4U | 56.4U | | 20 | NC |
| cis-1,2-Dichloroethene | 24.3J | 20.4J | 17.45 | 20 | |
| 1,1,1-Trichloroethane | 76.0U | 76.0U | | 20 | NC |
| Trichloroethene (TCE) | 2800 | 2720 | 2.90 | 20 | |
| Tetrachloroethene (PCE) | 94.5U | 94.5U | | 20 | NC |

* Values outside of QC limits
NC RPD Value Not Calculated

Comments:

3B

AIR VOLATILE BLANK SPIKE RECOVERY

SDG No.: Q3141 Lab Name: CH2M ASL

Analysis Method: TO15 Blank Spike ID: BS1X-1005

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| Analyte | Spike Added (UG/M3) | BS Result (UG/M3) | %R | QC Limits %R | Q |
|---|---|---|---|---|---|
| Vinyl Chloride | 78.0 | 59.3 | 76 | 70-130 | |
| 1,1-Dichloroethene | 121 | 98.8 | 82 | 70-130 | |
| Methylene chloride | 106 | 86.2 | 81 | 70-130 | |
| 1,1-Dichloroethane | 124 | 97.2 | 79 | 70-130 | |
| cis-1,2-Dichloroethene | 121 | 101 | 83 | 70-130 | |
| 1,1,1-Trichloroethane | 167 | 141 | 85 | 70-130 | |
| Trichloroethene (TCE) | 164 | 133 | 81 | 70-130 | |
| Tetrachloroethene (PCE) | 207 | 171 | 83 | 70-130 | |
| trans-1,2-Dichloroethene | 121 | 104 | 86 | 70-130 | |

* Values outside of QC limits

Comments:

4A

AIR VOLATILE METHOD BLANK SUMMARY

Field Sample ID:

XB1-1005

SDG No.: Q3141

Lab Name: CH2M ASL

Analysis Method: TO15

Lab Sample ID: XB1-1005

Lab File ID: XB1-1005.D

Date Analyzed: 10/05/16

GC Column: ZB-624 ID: 0.25 (mm)

Time Analyzed: 1447

Instrument Name: MSAA

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | BS1X-1005 | BS1X-1005 | BS1X-1005.D | 10/05/16 | 1403 |
| 2 | MW114D-SV-20-30-100216 | Q314101 | Q314101.D | 10/05/16 | 1612 |
| 3 | MW113S-SV-7-12-100316 | Q314103 | Q314103.D | 10/05/16 | 1737 |
| 4 | MW109D-SV-16-26-100316 | Q314104 | Q314104.D | 10/05/16 | 1821 |
| 5 | MW109S-SV-5-10-100316 | Q314105 | Q314105.D | 10/05/16 | 1903 |
| 6 | MW109S-SV-5-10-100316D | Q314105D | Q314105D.D | 10/05/16 | 1947 |
| 7 | MW114S-SV-8-18-100216 | Q314102 | Q314102D.D | 10/06/16 | 0828 |

Comments:

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3141 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 08/26/16

Lab File ID: T1-0826.D BFB Injection Time: 1532

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | Q |
|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 35016 (20.4) | |
| 75 | 30% to 60% of mass 95 | 82680 (48.2) | |
| 95 | base peak, 100% relative abundance | 171648 (100.0) | |
| 96 | 5% to 9% of mass 95 | 10400 (6.1) | |
| 173 | 0% to less than 2% of mass 174 | 1199 (0.8) | |
| 174 | greater than 50% of mass 95 | 146240 (85.2) | |
| 175 | 5% to 9% of mass 174 | 11159 (7.6) | |
| 176 | >95%, but <101% of mass 174 | 146752 (100.4) | |
| 177 | 5% to 9% of mass 176 | 8963 (6.1) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | LEVEL5 | LEVEL5 | LEVEL5.D | 08/26/16 | 1532 |
| 2 | LEVEL6 | LEVEL6 | LEVEL6.D | 08/26/16 | 1615 |
| 3 | LEVEL7 | LEVEL7 | LEVEL7.D | 08/26/16 | 1658 |
| 4 | LEVEL4 | LEVEL4 | LEVEL4.D | 08/26/16 | 1741 |
| 5 | LEVEL3 | LEVEL3 | LEVEL3.D | 08/26/16 | 1824 |
| 6 | LEVEL2 | LEVEL2 | LEVEL2.D | 08/26/16 | 1906 |
| 7 | LEVEL1 | LEVEL1 | LEVEL1.D | 08/26/16 | 1949 |
| 8 | ICV-0826 | ICV-0826 | ICV-0826.D | 08/26/16 | 2032 |

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3141 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 10/05/16

Lab File ID: T1-1005.D BFB Injection Time: 1320

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | | Q |
|---|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 4753 | (18.5) | |
| 75 | 30% to 60% of mass 95 | 12229 | (47.5) | |
| 95 | base peak, 100% relative abundance | 25720 | (100.0) | |
| 96 | 5% to 9% of mass 95 | 1380 | (5.4) | |
| 173 | 0% to less than 2% of mass 174 | 268 | (1.1) | |
| 174 | greater than 50% of mass 95 | 24032 | (93.4) | |
| 175 | 5% to 9% of mass 174 | 1798 | (7.5) | |
| 176 | >95%, but <101% of mass 174 | 23952 | (99.7) | |
| 177 | 5% to 9% of mass 176 | 1786 | (7.5) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | CV1-1005 | CV1-1005 | CV1-1005.D | 10/05/16 | 1320 |
| 2 | BS1X-1005 | BS1X-1005 | BS1X-1005.D | 10/05/16 | 1403 |
| 3 | XB1-1005 | XB1-1005 | XB1-1005.D | 10/05/16 | 1447 |
| 4 | MW114D-SV-20-30-100216 | Q314101 | Q314101.D | 10/05/16 | 1612 |
| 5 | MW113S-SV-7-12-100316 | Q314103 | Q314103.D | 10/05/16 | 1737 |
| 6 | MW109D-SV-16-26-100316 | Q314104 | Q314104.D | 10/05/16 | 1821 |
| 7 | MW109S-SV-5-10-100316 | Q314105 | Q314105.D | 10/05/16 | 1903 |
| 8 | MW109S-SV-5-10-100316D | Q314105D | Q314105D.D | 10/05/16 | 1947 |
| 9 | MW114S-SV-8-18-100216 | Q314102 | Q314102D.D | 10/06/16 | 0828 |

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3141

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N) N

Concentration Units: ppbv

| ICAL Sample IDs: | LEVEL1 | LEVEL2 | LEVEL3 | LEVEL4 | LEVEL5 | LEVEL6 |
|---|---|---|---|---|---|---|
| ICAL File IDs: | LEVEL1.D | LEVEL2.D | LEVEL3.D | LEVEL4.D | LEVEL5.D | LEVEL6.D |

| Analyte | Std 1 | RF 1 | Std 2 | RF 2 | Std 3 | RF 3 | Std 4 | RF 4 | Std 5 | RF 5 | Std 6 | RF 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Vinyl Chloride | .5 | 0.793 | 1 | 0.925 | 5 | 0.831 | 20 | 0.673 | 30 | 0.697 | 50 | 0.680 |
| 1,1-Dichloroethene | .5 | 1.422 | 1 | 1.506 | 5 | 1.326 | 20 | 1.178 | 30 | 1.207 | 50 | 1.183 |
| Methylene chloride | .5 | 1.213 | 1 | 1.225 | 5 | 0.944 | 20 | 0.829 | 30 | 0.865 | 50 | 0.861 |
| trans-1,2-Dichloroethene | .5 | 0.950 | 1 | 1.156 | 5 | 1.104 | 20 | 1.040 | 30 | 1.098 | 50 | 1.090 |
| 1,1-Dichloroethane | .5 | 1.609 | 1 | 1.659 | 5 | 1.370 | 20 | 1.280 | 30 | 1.321 | 50 | 1.304 |
| cis-1,2-Dichloroethene | .5 | 1.031 | 1 | 1.148 | 5 | 1.010 | 20 | 0.960 | 30 | 1.003 | 50 | 0.997 |
| 1,1,1-Trichloroethane | .5 | 2.416 | 1 | 2.480 | 5 | 2.023 | 20 | 1.755 | 30 | 1.847 | 50 | 1.813 |
| 1,4-difluorobenzene | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Trichloroethene (TCE) | .5 | 0.321 | 1 | 0.296 | 5 | 0.283 | 20 | 0.248 | 30 | 0.252 | 50 | 0.250 |
| Toluene-d8 | 10 | 0.903 | 10 | 0.903 | 10 | 0.897 | 10 | 0.900 | 10 | 0.897 | 10 | 0.913 |
| Tetrachloroethene (PCE) | .5 | 0.472 | 1 | 0.447 | 5 | 0.431 | 20 | 0.363 | 30 | 0.364 | 50 | 0.359 |
| Chlorobenzene-d5 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| 4-Bromofluorobenzene | 10 | 0.465 | 10 | 0.484 | 10 | 0.504 | 10 | 0.514 | 10 | 0.513 | 10 | 0.525 |

@ SPCC # CCC

# VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3141

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N) N

Concentration Units: ppbv

ICAL Sample IDs: LEVEL7

ICAL File IDs: LEVEL7.D

| Analyte | Std 7 | RF 7 | Std 8 | RF 8 | Std 9 | RF 9 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | | | | | | | | | | |
| Vinyl Chloride | 100 | 0.658 | | | | | | | | | | |
| 1,1-Dichloroethene | 100 | 1.120 | | | | | | | | | | |
| Methylene chloride | 100 | 0.838 | | | | | | | | | | |
| trans-1,2-Dichloroethene | 100 | 1.063 | | | | | | | | | | |
| 1,1-Dichloroethane | 100 | 1.272 | | | | | | | | | | |
| cis-1,2-Dichloroethene | 100 | 0.955 | | | | | | | | | | |
| 1,1,1-Trichloroethane | 100 | 1.747 | | | | | | | | | | |
| 1,4-difluorobenzene | 10 | 1.000 | | | | | | | | | | |
| Trichloroethene (TCE) | 100 | 0.240 | | | | | | | | | | |
| Toluene-d8 | 10 | 0.904 | | | | | | | | | | |
| Tetrachloroethene (PCE) | 100 | 0.340 | | | | | | | | | | |
| Chlorobenzene-d5 | 10 | 1.000 | | | | | | | | | | |
| 4-Bromofluorobenzene | 10 | 0.533 | | | | | | | | | | |

@ SPCC # CCC

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3141 | Lab Name: CH2M ASL

Analysis Method: TO15 | Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA | Calibration Times: 1532 1949

Heat Purge: (Y/N)N | Concentration Units: ppbv

| Analyte | Curve Type | Avg. RF | %RSD | r | COD | Q |
|---|---|---|---|---|---|---|
| Bromochloromethane | AVG | 1.000 | 0.00 | | | |
| Vinyl Chloride | AVG | 0.751 | 13.4 | | | |
| 1,1-Dichloroethene | AVG | 1.277 | 11.3 | | | |
| Methylene chloride | LINR | 0.968 | | 0.999 | | |
| trans-1,2-Dichloroethene | AVG | 1.072 | 6.05 | | | |
| 1,1-Dichloroethane | AVG | 1.402 | 11.6 | | | |
| cis-1,2-Dichloroethene | AVG | 1.015 | 6.37 | | | |
| 1,1,1-Trichloroethane | AVG | 2.011 | 15.5 | | | |
| 1,4-difluorobenzene | AVG | 1.000 | 0.00 | | | |
| Trichloroethene (TCE) | AVG | 0.270 | 11.2 | | | |
| Toluene-d8 | AVG | 0.902 | 0.61 | | | |
| Tetrachloroethene (PCE) | AVG | 0.396 | 13.1 | | | |
| Chlorobenzene-d5 | AVG | 1.000 | 0.00 | | | |
| 4-Bromofluorobenzene | AVG | 0.505 | 4.69 | | | |

@ SPCC # CCC

# VOLATILE INITIAL CALIBRATION CHECK

SDG No.: Q3141

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 08/26/16 2032

Instrument ID: MSAA

Init. Calib. Date(s): 08/26/16 08/26/16

2nd Source ICV-0826

Init. Calib. Time(s): 1532 1949

Lab File ID: ICV-0826.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 29.6 | 0.741 | 0.000 | -1 | 30 | |
| 1,1-Dichloroethene | 30.0 | 30.4 | 1.296 | 0.000 | 1 | 30 | |
| Methylene chloride | 30.0 | 33.9 | 0.961 | 0.000 | 13 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 30.5 | 1.090 | 0.000 | 2 | 30 | |
| 1,1-Dichloroethane | 30.0 | 28.8 | 1.348 | 0.000 | -4 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 32.4 | 1.095 | 0.000 | 8 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 29.4 | 1.974 | 0.000 | -2 | 30 | |
| Trichloroethene (TCE) | 30.0 | 29.7 | 0.267 | 0.000 | -1 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 28.7 | 0.379 | 0.000 | -4 | 30 | |

* SPCC # CCC

# VOLATILE CONTINUING CALIBRATION CHECK

SDG No.: Q3141

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 10/05/16 1320

Instrument ID: MSAA

Init. Calib. Date(s): 08/26/16 08/26/16

Cal Check ID: CV1-1005

Init. Calib. Time(s): 1532 1949

Lab File ID: CV1-1005.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 22.5 | 0.563 | 0.000 | -25 | 30 | |
| 1,1-Dichloroethene | 30.0 | 23.8 | 1.015 | 0.000 | -21 | 30 | |
| Methylene chloride | 30.0 | 23.5 | 0.668 | 0.000 | -22 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 24.8 | 0.885 | 0.000 | -17 | 30 | |
| 1,1-Dichloroethane | 30.0 | 22.6 | 1.057 | 0.000 | -25 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 24.4 | 0.826 | 0.000 | -19 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 24.4 | 1.637 | 0.000 | -19 | 30 | |
| Trichloroethene (TCE) | 30.0 | 23.2 | 0.209 | 0.000 | -23 | 30 | |
| Toluene-d8 | 10.0 | 9.58 | 0.864 | 0.000 | -4 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 23.0 | 0.303 | 0.000 | -24 | 30 | |
| 4-Bromofluorobenzene | 10.0 | 11.9 | 0.602 | 0.000 | 19 | 30 | |

* SPCC # CCC

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3141

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: LEVEL5 | Date Analyzed: 08/26/16

Lab File ID: LEVEL5.D | Time Analyzed: 1532

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 291021 | 14.62 | 1203115 | 16.29 | 987506 | 20.57 |
| | Upper Limit | 407429 | 15.12 | 1684361 | 16.79 | 1382508 | 21.07 |
| | Lower Limit | 174613 | 14.12 | 721869 | 15.79 | 592504 | 20.07 |
| Field Sample ID | Lab Sample ID | | | | | | |
| ICV-0826 | ICV-0826 | 290536 | 14.62 | 1157423 | 16.3 | 971840 | 20.57 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3141

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: CV1-1005 | Date Analyzed: 10/05/16

Lab File ID: CV1-1005.D | Time Analyzed: 1320

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 221233 | 14.61 | 953437 | 16.29 | 774032 | 20.56 |
| | Upper Limit | 309726 | 15.11 | 1334812 | 16.79 | 1083645 | 21.06 |
| | Lower Limit | 132740 | 14.11 | 572062 | 15.79 | 464419 | 20.06 |
| Field Sample ID | Lab Sample ID | | | | | | |
| BS1X-1005 | BS1X-1005 | 210413 | 14.61 | 891950 | 16.28 | 759274 | 20.56 |
| XB1-1005 | XB1-1005 | 220369 | 14.60 | 876990 | 16.28 | 736869 | 20.56 |
| MW114D-SV-20-30-1002 | Q314101 | 218702 | 14.60 | 880538 | 16.27 | 736129 | 20.56 |
| MW113S-SV-7-12-10031 | Q314103 | 202762 | 14.60 | 797274 | 16.28 | 660416 | 20.56 |
| MW109D-SV-16-26-1003 | Q314104 | 197054 | 14.60 | 775436 | 16.27 | 657063 | 20.56 |
| MW109S-SV-5-10-10031 | Q314105 | 169306 | 14.60 | 776250 | 16.27 | 658066 | 20.56 |
| MW109S-SV-5-10-10031 | Q314105D | 203217 | 14.60 | 802325 | 16.27 | 681827 | 20.56 |
| MW114S-SV-8-18-10021 | Q314102 | 170269 | 14.60 | 772190 | 16.28 | 661822 | 20.56 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

# CHAIN OF CUSTODY/SHIPPING DOCUMENTS

Q3141

ch2m

12750 Merit Drive Suite 1100
Dallas, TX
Tel No: (352) 384-7002
Fax No: (352) 214-2814

# CHAIN-OF-CUSTODY RECORD

COC NUMBER: 669272-2

| | | | |
|---|---|---|---|
| PROJECT NAME: 221 Sunset Drive | PROJECT NUMBER: 669272.16.01 | LAB NAME AND CONTACT: Applied Sciences Lab, Jordy McKinley, Lab PM | FAX AND MAIL REPORTS ADD TO: RECIPIENT 1 (Name and Company): Amy Klopper/CH2M, amy.klopper@ch2m.com |
| PROJECT PHASE/SITE/TASK: Residential VI Sampling 2016 | CTO OR DO NUMBER: | LAB PO NUMBER: NA | FAX AND MAIL REPORTS ADD TO: RECIPIENT 1 (Name and Company): Berrie Selcoe/CH2M, berrie.selcoe@ch2m.com |
| PROJECT CONTACT: Kimberly Stokas | PROJECT TEL NO AND FAX NO: Phone: 214-698-4839 | LAB TEL NO AND FAX NO: Phone: 541-768-3144 | FAX AND MAIL REPORTS ADD TO: RECIPIENT 3 (Name and Company): Kimberly Stokas/CH2M, kimberly.stokas@ch2m.com |

RECIPIENT 2 (Address, Tel No, and Fax No): Monica Schneider/CH2M, monica.schneider@ch2m.com

RECIPIENT 3 (Address, Tel No, and Fax No): email

| 17 ITEM | 19 SAMPLE ID | 20 MATRIX (see codes on SOP) | 21 DATE AND TIME START | 22 DATE AND TIME STOP | 23 CANISTER VACUUM IN FIELD, HG (START) | 23 CANISTER VACUUM IN FIELD, HG (STOP) | FLOW CONTROLLER ID | CANISTER ID | 23 DATA PKG LEVEL (see codes on SOP) | 24 TAT (calendar days) | TO-15 Scan | TO-15 SIM | 26 SAMPLE TYPE (see codes on SOP) | 27 LAB ID (for lab's use) | 28 COMMENTS/ SCREENING READINGS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MD-MW114D-100216 | SV | 10/2/16 14:58 | 10/2/16 15:03 | 28.98 | 7.97 | FC3227V | SG2011 | | 24 Hour | X | | | | 24 Hour TAT | 1 |
| 2 | MD-MW114S-100216 | SV | 10/2/16 16:02 | 10/2/16 16:07 | 28.94 | 3.52 | FC3236X | SG1857 | | 24 Hour | X | | | | 24 Hour TAT | 2 |
| 3 | MD-MW113S-100316 | SV | 10/3/16 11:07 | 10/3/16 11:12 | 28.94 | 3.72 | CO008 | SG1404 | | 24 Hour | X | | | | 24 Hour TAT | 3 |
| 4 | MD-MW109D-100316 | SV | 10/3/16 12:05 | 10/3/16 12:10 | 28.92 | 5.94 | CO011 | SG1659 | | 24 Hour | X | | | | 24 Hour TAT | 4 |
| 5 | MD-MW109S-100316 | SV | 10/3/16 12:45 | 10/3/16 12:50 | 28.93 | 6.14 | FC3944B | SG1756 | | 24 Hour | X | | | | 24 Hour TAT | 5 |
| 6 | | | | | | | | | | | | | | | | |
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SAMPLED BY AND COMPANY: (please print)

FedEx number & Special Instructions: Select VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, cis-1,3-DCE, trans-1,3-DCE, methylene chloride, PCE, TCE, and vinyl chloride)

SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):

| RELINQUISHED BY (Printed Name and Signature) | DATE | TIME | RECEIVED BY (Printed Name and Signature) | DATE | TIME |
|---|---|---|---|---|---|
| Erik Dittera | 10/4/16 | | [illegible] | 10/5/16 | 1330 |

Distribution: [ x ] Original - Laboratory (To be returned with Analytical Report); [ ] Copy 1 - Project File; [ ] Copy 2 - PMO

Form COC01, Rev 06/00

tracking: EL136572804US

# CH2M Applied Sciences Laboratory

## Sample Receipt Record

SDG ID: Q3141 Date Received: 10/5/2016

Client/Project: 221 Sunset Received by: PC

| | | | |
|---|---|---|---|
| Were custody seals intact and on the outside of the cooler? | ☑ Yes | ☐ No | ☐ N/A |
| Shipping Record: | ☐ Hand Delivered | ☐ On File | ☑ COC |
| Radiological Screening for DoD | ☐ Yes | ☐ No | ☑ N/A |
| Packing Material: | ☐ Hand Delivered | ☐ Ice | ☐ Blue Ice ☑ Box |
| Temp OK? (<6C) Therm ID: TH173 Exp. 10/16 | 22.1 °C | ☐ Yes | ☐ No ☑ N/A |
| Was a Chain of Custody (CoC) Provided? | ☑ Yes | ☐ No | ☐ N/A |
| Was the CoC correctly filled out (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did sample labels agree with COC? (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did the CoC list a correct bottle count and the preservative types (No=Correct on CoC) | ☑ Yes | ☐ No | ☐ N/A |
| Were the sample containers in good condition (not broken or leaking)? | ☑ Yes | ☐ No | ☐ N/A |
| Was enough sample volume provided for analysis? (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Containers supplied by ASL? | ☑ Yes | ☐ No | ☐ N/A |
| Any sample with < 1/2 holding time remaining? If so contact LPM and document below. | ☐ Yes | ☑ No | ☐ N/A |
| Samples have multi-phase? If yes, document on SRER | ☐ Yes | ☑ No | ☐ N/A |
| All water VOCs free of air bubbles? No, document on SRER | ☐ Yes | ☐ No | ☑ N/A |
| pH of all samples met criteria on receipt? If "No", preserve and document below. | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals filtered in the field? | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals have sediment in bottom of container? If so document below. | ☐ Yes | ☐ No | ☑ N/A |

### Preservation Adjustment

| Sample ID | Reagent | Reagent Lot Number | Volume Added | Initials/Date-Time | 24 hour pH check Initials/Time |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

Did pH of all metals samples preserved upon receipt meet criteria 24 hours after preservation? ☐ Yes ☐ No

### Sample Exception Report (The following exceptions were noted)

Client was notified on: Client contact:

Resolution to Exception:

**CH2M Applied Sciences Laboratory (ASL)**

1100 NE Circle Blvd, Suite 300, Corvallis, OR 97330

**Tel 541.768.3120** Email: asl@ch2m.com

# Amended Report

| | | | |
|---|---|---|---|
| Date: | 12/29/16 | Client: | 221 Sunset |
| SDG No.: | Q3155 | Project/Task: | |
| Revision No.: | 1 | Completed by: | CH |
| Affected Method(s): | TO-15 SCAN | Approved by: | KJM |

**Amendment(s) Completed and Reason(s):**

Client requested change of Field IDs

**Amendment(s) Justification:**

| | |
|---|---|
| | Reporting error |
| | Calculation error |
| | Missing information/data |
| | Wrong information/data |
| | Analytical problem/correction |
| X | Client change/request |
| | Subcontracted laboratory error |
| | Other (define) |

**Edata Required:**

| | |
|---|---|
| X | Yes |
| | No |

# Analytical Report for

# 221 Sunset Drive - Residential VI Sampling 2016

## ASL Report #: Q3155
## Project ID: 669272.16.01

**Attn: Kimberly Stokes**

Authorized and Released By:

Kathy McKinley

Laboratory Project Manager
Kathy McKinley
*(541) 758-0235 ext.23144*
*December 29, 2016*

All analyses performed by CH2M HILL are clearly indicated. Any subcontracted analyses are included as appended reports as received from the subcontracted laboratory. The results included in this report only relate to the samples listed on the following Sample Cross-Reference page. This report shall not be reproduced except in full, without the written approval of the laboratory.

Any unusual difficulties encountered during the analysis of your samples are discussed in the attached case narratives.

Accredited in accordance with NELAP:
Oregon (100022)
Louisiana (05031)

CH2M – Applied Sciences Laboratory
1100 NE Circle Boulevard, Suite 300
Corvallis, Oregon 97330 Email: asl@ch2m.com
www.ch2m.com

**ASL Report #: Q3155**

## Sample Receipt Comments

We certify that the test results meet all NELAP requirements.

## Sample Cross-Reference

| ASL Sample ID | Client Sample ID | Date/Time Collected | Date Received |
|---|---|---|---|
| Q315501 | MW110D-SV-10-20-100416 | 10/04/16 16:08 | 10/06/16 |
| Q315502 | MW110S-SV-5-10-100416 | 10/04/16 16:41 | 10/06/16 |
| Q315503 | MW111S-SV-7-12-100516 | 10/05/16 08:37 | 10/06/16 |
| Q315504 | MW111D-SV-12-22-100516 | 10/05/16 09:17 | 10/06/16 |
| Q315505 | MW108D-SV-20-30-100516 | 10/05/16 13:15 | 10/06/16 |
| Q315506 | MW112D-SV-20-30-100516 | 10/05/16 14:19 | 10/06/16 |
| Q315507 | MW112S-SV-6-11-100516 | 10/05/16 14:54 | 10/06/16 |

## Table of Contents

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Volatile Organics Analysis by Method TO-15 ..... 6

Chain of Custody/Shipping Documents..... 30

## Data Qualifiers

| | |
|---|---|
| U | The analyte was not detected and is reported as less than the quantitation (or detection) limit. |
| J | The analyte was positively identified and is reported as an estimated value below the quantitation limit. |
| E | The analyte was positively identified and the reported result exceeded the instrument calibration range. |
| B | Blank contamination—the reported result is associated with a contaminated blank. |
| M | A matrix effect was present. |
| R | The data must be evaluated for usability due to deficiencies in the ability to analyze the sample and meet QC criteria. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain QC criteria. |
| P | The primary and confirmation analyte result recoveries do not match (dual column analysis). |

CH2MHILL
Applied Sciences Laboratory (ASL)

# Applied Sciences Group QC Codes for Raw Data Mark Up

| Code | Description |
|---|---|
| R01 | Illegible entry |
| R02 | Unnecessary entry |
| R03 | Typo |
| R04 | Misspelled |
| R05 | Page mis-numbered |
| R06 | Transcription error or incorrect entry |
| R07 | Rounding error |
| R08 | Unused code |
| R09 | Unused code |
| R10 | Wrong date entered |
| R11 | Wrong sample number |
| R12 | Wrong dilution factor |
| R13 | Wrong concentration |
| R14 | Wrong batch number |
| R15 | Wrong standard concentration |
| R16 | Wrong standard lot # |
| R17 | Remake of standards |
| R18 | Unused code |
| R19 | Unused code |
| R20 | Re-calibration of equipment |
| R21 | Sample rerun |
| R22 | Miscalculation |
| R23 | Wrong detection limit given |
| R24 | Less than reporting limit |
| R25 | Non-target compound |
| R26 | Less than detection limit |
| R27 | Unused code |
| R28 | Includes dilution factor |
| R29 | Sample relogged-in under a different work order |
| R30 | Equipment malfunction |
| R31 | Unused code |
| R32 | Unused code |
| R33 | Manual integration of qualifying ion only |
| R34 | Software split peak |
| R35 | Software included interfering peak |
| R37 | Peak area enhanced by software |
| R38 | Peak area excluded by software |
| R39 | Peak misidentification by software |
| R40 | Delete baseline noise |
| R41 | Unused code |
| R42 | Unused code |
| R43 | Unused code |
| R44 | Reanalysis due to the failure of an ISTD |
| R45 | Analysis didn't acquire |

# ANALYSIS METHOD

# TO15

*1100 NE Circle Blvd., Suite 300*
*Corvallis, OR 97330*
*Tel 541-768-3120 Fax 541-752-0276*

# CASE NARRATIVE
# GC/MS VOLATILES ANALYSIS

**Lab Name:** CH2M ASL **ASL SDG#:** Q3155

**Project:** 221 Sunset Drive **Project #:** 669272.16.01

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

**Method(s):**
TO15

# SAMPLE DATA SUMMARY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW110D-SV-10-20-100416**

SDG No.: Q3155

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q315501

Lab File ID: Q315501dil.D

Level: (LOW/MED) LOW

Date Received: 10/06/16

Date Analyzed: 10/06/16

Dilution Factor: 472.5

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 184 | 614 | 614 | U |
| 75-35-4 | 1,1-Dichloroethene | 286 | 952 | 952 | U |
| 75-09-2 | Methylene chloride | 251 | 8340 | 8340 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 286 | 952 | 952 | U |
| 75-34-3 | 1,1-Dichloroethane | 292 | 972 | 972 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 286 | 952 | 1750 | |
| 71-55-6 | 1,1,1-Trichloroethane | 393 | 1310 | 1310 | U |
| 79-01-6 | Trichloroethene (TCE) | 387 | 1290 | 145000 | |
| 127-18-4 | Tetrachloroethene (PCE) | 489 | 1630 | 1630 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW110S-SV-5-10-100416**

SDG No.: Q3155

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q315502

Lab File ID: Q315502.D

Level: (LOW/MED) LOW

Date Received: 10/06/16

Date Analyzed: 10/06/16

Dilution Factor: 468.75

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 183 | 608 | 608 | U |
| 75-35-4 | 1,1-Dichloroethene | 284 | 944 | 944 | U |
| 75-09-2 | Methylene chloride | 248 | 8270 | 8270 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 284 | 944 | 944 | U |
| 75-34-3 | 1,1-Dichloroethane | 289 | 963 | 963 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 284 | 944 | 4560 | |
| 71-55-6 | 1,1,1-Trichloroethane | 390 | 1300 | 1300 | U |
| 79-01-6 | Trichloroethene (TCE) | 384 | 1280 | 134000 | |
| 127-18-4 | Tetrachloroethene (PCE) | 485 | 1610 | 1610 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW111S-SV-7-12-100516**

SDG No.: Q3155

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q315503

Lab File ID: Q315503.D

Level: (LOW/MED) LOW

Date Received: 10/06/16

Date Analyzed: 10/06/16

Dilution Factor: 24.63

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 9.59 | 32.0 | 32.0 | U |
| 75-35-4 | 1,1-Dichloroethene | 14.9 | 49.6 | 49.6 | U |
| 75-09-2 | Methylene chloride | 13.0 | 435 | 435 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 14.9 | 49.6 | 49.6 | U |
| 75-34-3 | 1,1-Dichloroethane | 15.2 | 50.6 | 50.6 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 14.9 | 49.6 | 49.6 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 20.5 | 68.3 | 68.3 | U |
| 79-01-6 | Trichloroethene (TCE) | 20.2 | 67.2 | 3510 | |
| 127-18-4 | Tetrachloroethene (PCE) | 25.5 | 84.9 | 84.9 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW111D-SV-12-22-100516**

SDG No.: Q3155

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q315504

Lab File ID: Q315504dil.D

Level: (LOW/MED) LOW

Date Received: 10/06/16

Date Analyzed: 10/07/16

Dilution Factor: 419.44

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 164 | 546 | 546 | U |
| 75-35-4 | 1,1-Dichloroethene | 254 | 847 | 847 | U |
| 75-09-2 | Methylene chloride | 222 | 7420 | 7420 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 254 | 847 | 847 | U |
| 75-34-3 | 1,1-Dichloroethane | 259 | 865 | 865 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 254 | 847 | 847 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 349 | 1170 | 1170 | U |
| 79-01-6 | Trichloroethene (TCE) | 344 | 1150 | 9180 | |
| 127-18-4 | Tetrachloroethene (PCE) | 434 | 1450 | 1450 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW108D-SV-20-30-100516**

SDG No.: Q3155

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q315505

Lab File ID: Q315505.D

Level: (LOW/MED) LOW

Date Received: 10/06/16

Date Analyzed: 10/06/16

Dilution Factor: 500

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 195 | 650 | 650 | U |
| 75-35-4 | 1,1-Dichloroethene | 303 | 1010 | 1010 | U |
| 75-09-2 | Methylene chloride | 265 | 8830 | 8830 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 303 | 1010 | 1010 | U |
| 75-34-3 | 1,1-Dichloroethane | 309 | 1030 | 1030 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 303 | 1010 | 1010 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 416 | 1390 | 1390 | U |
| 79-01-6 | Trichloroethene (TCE) | 410 | 1370 | 116000 | |
| 127-18-4 | Tetrachloroethene (PCE) | 517 | 1720 | 1720 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW112D-SV-20-30-100516**

SDG No.: Q3155

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q315506

Lab File ID: Q315506dil.D

Level: (LOW/MED) LOW

Date Received: 10/06/16

Date Analyzed: 10/07/16

Dilution Factor: 727.78

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 283 | 946 | 946 | U |
| 75-35-4 | 1,1-Dichloroethene | 440 | 1470 | 1470 | U |
| 75-09-2 | Methylene chloride | 385 | 12900 | 12900 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 440 | 1470 | 1470 | U |
| 75-34-3 | 1,1-Dichloroethane | 449 | 1500 | 1500 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 440 | 1470 | 1470 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 605 | 2020 | 2020 | U |
| 79-01-6 | Trichloroethene (TCE) | 595 | 1990 | 255000 | |
| 127-18-4 | Tetrachloroethene (PCE) | 752 | 2510 | 2510 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW112S-SV-6-11-100516**

SDG No.: Q3155

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q315507

Lab File ID: Q315507dil.D

Level: (LOW/MED) LOW

Date Received: 10/06/16

Date Analyzed: 10/07/16

Dilution Factor: 11.45

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 4.47 | 14.9 | 14.9 | U |
| 75-35-4 | 1,1-Dichloroethene | 6.94 | 23.1 | 23.1 | U |
| 75-09-2 | Methylene chloride | 6.08 | 202 | 202 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 6.94 | 23.1 | 23.1 | U |
| 75-34-3 | 1,1-Dichloroethane | 7.08 | 23.6 | 23.6 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 6.94 | 23.1 | 23.1 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 9.55 | 31.8 | 31.8 | U |
| 79-01-6 | Trichloroethene (TCE) | 9.39 | 31.3 | 3120 | |
| 127-18-4 | Tetrachloroethene (PCE) | 11.9 | 39.5 | 39.5 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**XB1-1006**

SDG No.: Q3155

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: XB1-1006

Lab File ID: XB1-1006.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 10/06/16

Dilution Factor: 1

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 0.390 | 1.30 | 1.30 | U |
| 75-35-4 | 1,1-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-09-2 | Methylene chloride | 0.530 | 17.7 | 17.7 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-34-3 | 1,1-Dichloroethane | 0.618 | 2.06 | 2.06 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 0.833 | 2.77 | 2.77 | U |
| 79-01-6 | Trichloroethene (TCE) | 0.819 | 2.73 | 2.73 | U |
| 127-18-4 | Tetrachloroethene (PCE) | 1.03 | 3.45 | 3.45 | U |

# QC SUMMARY

# AIR VOLATILE SURROGATE RECOVERY

SDG No.: Q3155 Lab Name: CH2M ASL

Analysis Method: TO15

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| | Field/QC Sample ID | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | # Out |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BS1X-1006 | 101 | 117 | | | | | | | | | | | |
| 2 | XB1-1006 | 100 | 99 | | | | | | | | | | | |
| 3 | MW110D-SV-10-20-100416 | 96 | 103 | | | | | | | | | | | |
| 4 | MW110S-SV-5-10-100416 | 100 | 96 | | | | | | | | | | | |
| 5 | MW111S-SV-7-12-100516 | 100 | 100 | | | | | | | | | | | |
| 6 | MW108D-SV-20-30-100516 | 92 | 104 | | | | | | | | | | | |
| 7 | MW111D-SV-12-22-100516 | 91 | 108 | | | | | | | | | | | |
| 8 | MW112D-SV-20-30-100516 | 102 | 100 | | | | | | | | | | | |
| 9 | MW112S-SV-6-11-100516 | 100 | 106 | | | | | | | | | | | |

* Values outside of QC limits
D Surrogate diluted out

| | | QC Limits |
|---|---|---|
| S1: | Toluene-d8 | (70-130) |
| S2: | 4-Bromofluorobenzene | (70-130) |

3B

AIR VOLATILE BLANK SPIKE RECOVERY

SDG No.: Q3155 Lab Name: CH2M ASL

Analysis Method: TO15 Blank Spike ID: BS1X-1006

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| Analyte | Spike Added (UG/M3) | BS Result (UG/M3) | %R | QC Limits %R | Q |
|---|---|---|---|---|---|
| Vinyl Chloride | 78.0 | 61.1 | 78 | 70-130 | |
| 1,1-Dichloroethene | 121 | 104 | 86 | 70-130 | |
| Methylene chloride | 106 | 91.9 | 87 | 70-130 | |
| 1,1-Dichloroethane | 124 | 101 | 82 | 70-130 | |
| cis-1,2-Dichloroethene | 121 | 104 | 86 | 70-130 | |
| 1,1,1-Trichloroethane | 167 | 148 | 89 | 70-130 | |
| Trichloroethene (TCE) | 164 | 137 | 84 | 70-130 | |
| Tetrachloroethene (PCE) | 207 | 177 | 85 | 70-130 | |
| trans-1,2-Dichloroethene | 121 | 107 | 89 | 70-130 | |

* Values outside of QC limits

Comments:

4A

AIR VOLATILE METHOD BLANK SUMMARY

Field Sample ID:

XB1-1006

SDG No.: Q3155

Lab Name: CH2M ASL

Analysis Method: TO15

Lab Sample ID: XB1-1006

Lab File ID: XB1-1006.D

Date Analyzed: 10/06/16

GC Column: ZB-624 ID: 0.25 (mm)

Time Analyzed: 1349

Instrument Name: MSAA

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | BS1X-1006 | BS1X-1006 | BS1X-1006.D | 10/06/16 | 1308 |
| 2 | MW110D-SV-10-20-100416 | Q315501 | Q315501dil.D | 10/06/16 | 1513 |
| 3 | MW110S-SV-5-10-100416 | Q315502 | Q315502.D | 10/06/16 | 1557 |
| 4 | MW111S-SV-7-12-100516 | Q315503 | Q315503.D | 10/06/16 | 1639 |
| 5 | MW108D-SV-20-30-100516 | Q315505 | Q315505.D | 10/06/16 | 1805 |
| 6 | MW111D-SV-12-22-100516 | Q315504 | Q315504dil.D | 10/07/16 | 0204 |
| 7 | MW112D-SV-20-30-100516 | Q315506 | Q315506dil.D | 10/07/16 | 0247 |
| 8 | MW112S-SV-6-11-100516 | Q315507 | Q315507dil.D | 10/07/16 | 0331 |

Comments:

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3155 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 08/26/16

Lab File ID: T1-0826.D BFB Injection Time: 1532

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | | Q |
|---|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 35016 | (20.4) | |
| 75 | 30% to 60% of mass 95 | 82680 | (48.2) | |
| 95 | base peak, 100% relative abundance | 171648 | (100.0) | |
| 96 | 5% to 9% of mass 95 | 10400 | (6.1) | |
| 173 | 0% to less than 2% of mass 174 | 1199 | (0.8) | |
| 174 | greater than 50% of mass 95 | 146240 | (85.2) | |
| 175 | 5% to 9% of mass 174 | 11159 | (7.6) | |
| 176 | >95%, but <101% of mass 174 | 146752 | (100.4) | |
| 177 | 5% to 9% of mass 176 | 8963 | (6.1) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | LEVEL5 | LEVEL5 | LEVEL5.D | 08/26/16 | 1532 |
| 2 | LEVEL6 | LEVEL6 | LEVEL6.D | 08/26/16 | 1615 |
| 3 | LEVEL7 | LEVEL7 | LEVEL7.D | 08/26/16 | 1658 |
| 4 | LEVEL4 | LEVEL4 | LEVEL4.D | 08/26/16 | 1741 |
| 5 | LEVEL3 | LEVEL3 | LEVEL3.D | 08/26/16 | 1824 |
| 6 | LEVEL2 | LEVEL2 | LEVEL2.D | 08/26/16 | 1906 |
| 7 | LEVEL1 | LEVEL1 | LEVEL1.D | 08/26/16 | 1949 |
| 8 | ICV-0826 | ICV-0826 | ICV-0826.D | 08/26/16 | 2032 |

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3155 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 10/06/16

Lab File ID: T1-1006.D BFB Injection Time: 1227

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | | Q |
|---|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 39696 | (22.2) | |
| 75 | 30% to 60% of mass 95 | 92536 | (51.9) | |
| 95 | base peak, 100% relative abundance | 178432 | (100.0) | |
| 96 | 5% to 9% of mass 95 | 11933 | (6.7) | |
| 173 | 0% to less than 2% of mass 174 | 1495 | (1.0) | |
| 174 | greater than 50% of mass 95 | 146240 | (82.0) | |
| 175 | 5% to 9% of mass 174 | 12111 | (8.3) | |
| 176 | >95%, but <101% of mass 174 | 147264 | (100.7) | |
| 177 | 5% to 9% of mass 176 | 9812 | (6.7) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | CV1-1006 | CV1-1006 | CV1-1006.D | 10/06/16 | 1227 |
| 2 | BS1X-1006 | BS1X-1006 | BS1X-1006.D | 10/06/16 | 1308 |
| 3 | XB1-1006 | XB1-1006 | XB1-1006.D | 10/06/16 | 1349 |
| 4 | MW110D-SV-10-20-100416 | Q315501 | Q315501dil.D | 10/06/16 | 1513 |
| 5 | MW110S-SV-5-10-100416 | Q315502 | Q315502.D | 10/06/16 | 1557 |
| 6 | MW111S-SV-7-12-100516 | Q315503 | Q315503.D | 10/06/16 | 1639 |
| 7 | MW108D-SV-20-30-100516 | Q315505 | Q315505.D | 10/06/16 | 1805 |
| 8 | MW111D-SV-12-22-100516 | Q315504 | Q315504dil.D | 10/07/16 | 0204 |
| 9 | MW112D-SV-20-30-100516 | Q315506 | Q315506dil.D | 10/07/16 | 0247 |
| 10 | MW112S-SV-6-11-100516 | Q315507 | Q315507dil.D | 10/07/16 | 0331 |

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3155

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N) N

Concentration Units: ppbv

| ICAL Sample IDs: | LEVEL1 | LEVEL2 | LEVEL3 | LEVEL4 | LEVEL5 | LEVEL6 |
|---|---|---|---|---|---|---|
| ICAL File IDs: | LEVEL1.D | LEVEL2.D | LEVEL3.D | LEVEL4.D | LEVEL5.D | LEVEL6.D |

| Analyte | Std 1 | RF 1 | Std 2 | RF 2 | Std 3 | RF 3 | Std 4 | RF 4 | Std 5 | RF 5 | Std 6 | RF 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Vinyl Chloride | .5 | 0.793 | 1 | 0.925 | 5 | 0.831 | 20 | 0.673 | 30 | 0.697 | 50 | 0.680 |
| 1,1-Dichloroethene | .5 | 1.422 | 1 | 1.506 | 5 | 1.326 | 20 | 1.178 | 30 | 1.207 | 50 | 1.183 |
| Methylene chloride | .5 | 1.213 | 1 | 1.225 | 5 | 0.944 | 20 | 0.829 | 30 | 0.865 | 50 | 0.861 |
| trans-1,2-Dichloroethene | .5 | 0.950 | 1 | 1.156 | 5 | 1.104 | 20 | 1.040 | 30 | 1.098 | 50 | 1.090 |
| 1,1-Dichloroethane | .5 | 1.609 | 1 | 1.659 | 5 | 1.370 | 20 | 1.280 | 30 | 1.321 | 50 | 1.304 |
| cis-1,2-Dichloroethene | .5 | 1.031 | 1 | 1.148 | 5 | 1.010 | 20 | 0.960 | 30 | 1.003 | 50 | 0.997 |
| 1,1,1-Trichloroethane | .5 | 2.416 | 1 | 2.480 | 5 | 2.023 | 20 | 1.755 | 30 | 1.847 | 50 | 1.813 |
| 1,4-difluorobenzene | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Trichloroethene (TCE) | .5 | 0.321 | 1 | 0.296 | 5 | 0.283 | 20 | 0.248 | 30 | 0.252 | 50 | 0.250 |
| Toluene-d8 | 10 | 0.903 | 10 | 0.903 | 10 | 0.897 | 10 | 0.900 | 10 | 0.897 | 10 | 0.913 |
| Tetrachloroethene (PCE) | .5 | 0.472 | 1 | 0.447 | 5 | 0.431 | 20 | 0.363 | 30 | 0.364 | 50 | 0.359 |
| Chlorobenzene-d5 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| 4-Bromofluorobenzene | 10 | 0.465 | 10 | 0.484 | 10 | 0.504 | 10 | 0.514 | 10 | 0.513 | 10 | 0.525 |

@ SPCC # CCC

# VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3155

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N) N

Concentration Units: ppbv

ICAL Sample IDs: LEVEL7

ICAL File IDs: LEVEL7.D

| Analyte | Std 7 | RF 7 | Std 8 | RF 8 | Std 9 | RF 9 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | | | | | | | | | | |
| Vinyl Chloride | 100 | 0.658 | | | | | | | | | | |
| 1,1-Dichloroethene | 100 | 1.120 | | | | | | | | | | |
| Methylene chloride | 100 | 0.838 | | | | | | | | | | |
| trans-1,2-Dichloroethene | 100 | 1.063 | | | | | | | | | | |
| 1,1-Dichloroethane | 100 | 1.272 | | | | | | | | | | |
| cis-1,2-Dichloroethene | 100 | 0.955 | | | | | | | | | | |
| 1,1,1-Trichloroethane | 100 | 1.747 | | | | | | | | | | |
| 1,4-difluorobenzene | 10 | 1.000 | | | | | | | | | | |
| Trichloroethene (TCE) | 100 | 0.240 | | | | | | | | | | |
| Toluene-d8 | 10 | 0.904 | | | | | | | | | | |
| Tetrachloroethene (PCE) | 100 | 0.340 | | | | | | | | | | |
| Chlorobenzene-d5 | 10 | 1.000 | | | | | | | | | | |
| 4-Bromofluorobenzene | 10 | 0.533 | | | | | | | | | | |

@ SPCC # CCC

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3155

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N)N

Concentration Units: ppbv

| Analyte | Curve Type | Avg. RF | %RSD | r | COD | Q |
|---|---|---|---|---|---|---|
| Bromochloromethane | AVG | 1.000 | 0.00 | | | |
| Vinyl Chloride | AVG | 0.751 | 13.4 | | | |
| 1,1-Dichloroethene | AVG | 1.277 | 11.3 | | | |
| Methylene chloride | LINR | 0.968 | | 0.999 | | |
| trans-1,2-Dichloroethene | AVG | 1.072 | 6.05 | | | |
| 1,1-Dichloroethane | AVG | 1.402 | 11.6 | | | |
| cis-1,2-Dichloroethene | AVG | 1.015 | 6.37 | | | |
| 1,1,1-Trichloroethane | AVG | 2.011 | 15.5 | | | |
| 1,4-difluorobenzene | AVG | 1.000 | 0.00 | | | |
| Trichloroethene (TCE) | AVG | 0.270 | 11.2 | | | |
| Toluene-d8 | AVG | 0.902 | 0.61 | | | |
| Tetrachloroethene (PCE) | AVG | 0.396 | 13.1 | | | |
| Chlorobenzene-d5 | AVG | 1.000 | 0.00 | | | |
| 4-Bromofluorobenzene | AVG | 0.505 | 4.69 | | | |

@ SPCC # CCC

# VOLATILE INITIAL CALIBRATION CHECK

SDG No.: Q3155

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 08/26/16 2032

Instrument ID: MSAA

Init. Calib. Date(s): 08/26/16 08/26/16

2nd Source ICV-0826

Init. Calib. Time(s): 1532 1949

Lab File ID: ICV-0826.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 29.6 | 0.741 | 0.000 | -1 | 30 | |
| 1,1-Dichloroethene | 30.0 | 30.4 | 1.296 | 0.000 | 1 | 30 | |
| Methylene chloride | 30.0 | 33.9 | 0.961 | 0.000 | 13 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 30.5 | 1.090 | 0.000 | 2 | 30 | |
| 1,1-Dichloroethane | 30.0 | 28.8 | 1.348 | 0.000 | -4 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 32.4 | 1.095 | 0.000 | 8 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 29.4 | 1.974 | 0.000 | -2 | 30 | |
| Trichloroethene (TCE) | 30.0 | 29.7 | 0.267 | 0.000 | -1 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 28.7 | 0.379 | 0.000 | -4 | 30 | |

* SPCC # CCC

# VOLATILE CONTINUING CALIBRATION CHECK

SDG No.: Q3155

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 10/06/16 1227

Instrument ID: MSAA

Init. Calib. Date(s): 08/26/16 08/26/16

Cal Check ID: CV1-1006

Init. Calib. Time(s): 1532 1949

Lab File ID: CV1-1006.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 31.9 | 0.798 | 0.000 | 6 | 30 | |
| 1,1-Dichloroethene | 30.0 | 32.4 | 1.381 | 0.000 | 8 | 30 | |
| Methylene chloride | 30.0 | 35.6 | 1.010 | 0.000 | 19 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 34.7 | 1.239 | 0.000 | 16 | 30 | |
| 1,1-Dichloroethane | 30.0 | 31.3 | 1.464 | 0.000 | 4 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 33.2 | 1.122 | 0.000 | 11 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 33.3 | 2.230 | 0.000 | 11 | 30 | |
| Trichloroethene (TCE) | 30.0 | 31.1 | 0.280 | 0.000 | 4 | 30 | |
| Toluene-d8 | 10.0 | 10.1 | 0.911 | 0.000 | 1 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 31.0 | 0.410 | 0.000 | 3 | 30 | |
| 4-Bromofluorobenzene | 10.0 | 11.5 | 0.583 | 0.000 | 15 | 30 | |

* SPCC # CCC

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3155

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: LEVEL5 | Date Analyzed: 08/26/16

Lab File ID: LEVEL5.D | Time Analyzed: 1532

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 291021 | 14.62 | 1203115 | 16.29 | 987506 | 20.57 |
| | Upper Limit | 407429 | 15.12 | 1684361 | 16.79 | 1382508 | 21.07 |
| | Lower Limit | 174613 | 14.12 | 721869 | 15.79 | 592504 | 20.07 |
| Field Sample ID | Lab Sample ID | | | | | | |
| ICV-0826 | ICV-0826 | 290536 | 14.62 | 1157423 | 16.3 | 971840 | 20.57 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3155

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: CV1-1006 | Date Analyzed: 10/06/16

Lab File ID: CV1-1006.D | Time Analyzed: 1227

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 186797 | 14.61 | 761448 | 16.29 | 646650 | 20.56 |
| | Upper Limit | 261516 | 15.11 | 1066027 | 16.79 | 905310 | 21.06 |
| | Lower Limit | 112078 | 14.11 | 456869 | 15.79 | 387990 | 20.06 |
| Field Sample ID | Lab Sample ID | | | | | | |
| BS1X-1006 | BS1X-1006 | 185868 | 14.61 | 773503 | 16.29 | 656149 | 20.56 |
| XB1-1006 | XB1-1006 | 197290 | 14.60 | 779021 | 16.28 | 651212 | 20.56 |
| MW110D-SV-10-20-1004 | Q315501 | 206658 | 14.60 | 810519 | 16.27 | 670543 | 20.56 |
| MW110S-SV-5-10-10041 | Q315502 | 203459 | 14.60 | 809536 | 16.28 | 670109 | 20.56 |
| MW111S-SV-7-12-10051 | Q315503 | 205986 | 14.60 | 806866 | 16.27 | 681925 | 20.56 |
| MW108D-SV-20-30-1005 | Q315505 | 211623 | 14.60 | 821384 | 16.27 | 690810 | 20.56 |
| MW111D-SV-12-22-1005 | Q315504 | 196774 | 14.60 | 761235 | 16.28 | 669981 | 20.56 |
| MW112D-SV-20-30-1005 | Q315506 | 197344 | 14.60 | 770741 | 16.28 | 662624 | 20.56 |
| MW112S-SV-6-11-10051 | Q315507 | 194445 | 14.60 | 792003 | 16.28 | 692947 | 20.56 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

# CHAIN OF CUSTODY/SHIPPING DOCUMENTS

Q3155

ch2m

12750 Merit Drive Suite 1100
Dallas, TX
Tel No: (352) 384-7002
Fax No: (352) 214-2814

# CHAIN-OF-CUSTODY RECORD

COC NUMBER: 681225-1

| | | | |
|---|---|---|---|
| PROJECT NAME: 221 Sunset Drive | PROJECT NUMBER: 681225.GW.01 | LAB NAME AND CONTACT: Applied Sciences Lab / Kathy McKinley, Lab PM | FAX AND MAIL REPORTS ISSUED TO: RECIPIENT 1 (Name and Company): Amy Klopper/CH2M amy.klopper@ch2m.com |
| PROJECT MANAGER'S NAME: Residential VI Sampling 2016 | CTO OR DO NUMBER: | LAB PO NUMBER: NA | FAX AND MAIL REPORTS ISSUED TO: RECIPIENT 2 (Name and Company): Barrie Selcoe/CH2M barrie.selcoe@ch2m.com |
| PROJECT CONTACT: Kimberly Stokas | PROJECT TEL NO AND FAX NO: Phone: 214-998-4839 | LAB TEL NO AND FAX NO: Phone: 541-758-5144 | FAX AND MAIL REPORT ISSUED TO: RECIPIENT 3 (Name and Company): Kimberly Stokas/CH2M kimberly.stokas@ch2m.com |

RECIPIENT 1 (Address, Tel No., and Fax No.):
RECIPIENT 2 (Address, Tel No., and Fax No.): Monica Schneider/CH2M monica.schneider@ch2m.com
RECIPIENT 3 (Address, Tel No., and Fax No.): email

| 17 ITEM | 19 SAMPLE ID | 20 MATRIX (see codes on SOP) | 21 DATE AND TIME START | 21 DATE AND TIME STOP | 23 CANISTER VACUUM IN FIELD, HG (START) | 23 CANISTER VACUUM IN FIELD, HG (STOP) | FLOW CONTROLLER ID | CANISTER ID | 23 DATA PKG LEVEL (see codes on SOP) | 24 TAT (calendar days) | TO-15 Scan | TO-15 SIM | 26 SAMPLE TYPE (see codes on SOP) | 27 LAB ID (for lab's use) | 28 COMMENTS/ SCREENING READINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MW110D-SV-10-20-100416 | SV | 10/4/16 16:02 | 10/4/16 16:08 | 28.76 | 6.48 | FC3241X | SG1691 | | 24 Hour | X | | | | 24 Hour TAT |
| 2 | MW110S-SV-5-10-100416 | SV | 10/4/16 16:36 | 10/4/16 16:41 | 28.73 | 6.07 | FC3008B | SG1320 | | 24 Hour | X | | | | 24 Hour TAT |
| 3 | MW111S-SV-7-12-100516 | SV | 10/5/16 8:32 | 10/5/16 8:37 | 28.71 | 4.55 | CO010 | SG1682 | | 24 Hour | X | | | | 24 Hour TAT |
| 4 | MW111D-SV-12-22-100516 | SV | 10/5/16 9:12 | 10/5/16 9:17 | 28.73 | 5.39 | FC3007B | SG1889 | | 24 Hour | X | | | | 24 Hour TAT |
| 5 | MW108D-SV-20-30-100516 | SV | 10/5/16 13:10 | 10/5/16 13:15 | 28.69 | 5.24 | FC3911B | SG1352 | | 24 Hour | X | | | | 24 Hour TAT |
| 6 | MW112D-SV-20-30-100516 | SV | 10/5/16 14:14 | 10/5/16 14:19 | 28.89 | 4.12 | CO049 | SG1414 | | 24 Hour | X | | | | 24 Hour TAT |
| 7 | MW112S-SV-7-12-100516 | SV | 10/5/16 14:59 | 10/5/16 14:54 | 28.83 | 7.01 | CO054 | SG1874 | | 24 Hour | X | | | | 24 Hour TAT |
| 8 | | | | | | | | | | | | | | | |
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| 29 | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | |

SAMPLERS AND COMPANY: (please print)

Field X marker & Spoiled Instructions
Select VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, methylene chloride, PCE, TCE, and vinyl chloride)

SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (at lab use): 22.3°C

| RELINQUISHED BY (Printed Name and Signature) | DATE | TIME | RECEIVED BY (Printed Name and Signature) | DATE | TIME |
|---|---|---|---|---|---|
| Zach Dettman | 10/5/16 | | Russell Southard / Russell Southard | 10/6/16 | 1015 |

Distribution: [ x ] Original - Laboratory (To be returned with Analytical Report), [ ] Copy 1 - Project File, [ ] Copy 2 - PMO

Form COC01, Rev 05/07

# CH2M Applied Sciences Laboratory

## Sample Receipt Record

SDG ID: Q3155 | Date Received: 10/6/2016

Client/Project: 221 Sunset | Received by: PC

| | | | |
|---|---|---|---|
| Were custody seals intact and on the outside of the cooler? | ☑ Yes | ☐ No | ☐ N/A |
| Shipping Record: | ☐ Hand Delivered | ☑ On File | ☐ COC |
| Radiological Screening for DoD | ☐ Yes | ☐ No | ☑ N/A |
| Packing Material: | ☐ Hand Delivered | ☐ Ice ☐ Blue Ice | ☑ Box |
| Temp OK? (<6C) Therm ID: TH173 Exp. 10/16 | 22.3 °C ☐ Yes | ☐ No | ☑ N/A |
| Was a Chain of Custody (CoC) Provided? | ☑ Yes | ☐ No | ☐ N/A |
| Was the CoC correctly filled out (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did sample labels agree with COC? (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did the CoC list a correct bottle count and the preservative types (No=Correct on CoC) | ☑ Yes | ☐ No | ☐ N/A |
| Were the sample containers in good condition (not broken or leaking)? | ☑ Yes | ☐ No | ☐ N/A |
| Was enough sample volume provided for analysis? (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Containers supplied by ASL? | ☑ Yes | ☐ No | ☐ N/A |
| Any sample with < 1/2 holding time remaining? If so contact LPM and document below. | ☐ Yes | ☑ No | ☐ N/A |
| Samples have multi-phase? If yes, document on SRER | ☐ Yes | ☑ No | ☐ N/A |
| All water VOCs free of air bubbles? No, document on SRER | ☐ Yes | ☐ No | ☑ N/A |
| pH of all samples met criteria on receipt? If "No", preserve and document below. | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals filtered in the field? | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals have sediment in bottom of container? If so document below. | ☐ Yes | ☐ No | ☑ N/A |

### Preservation Adjustment

| Sample ID | Reagent | Reagent Lot Number | Volume Added | Initials/Date-Time | 24 hour pH check Initials/Time |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

Did pH of all metals samples preserved upon receipt meet criteria 24 hours after preservation? ☐ Yes ☐ No

### Sample Exception Report (The following exceptions were noted)

Client was notified on: Client contact:

Resolution to Exception:

# Analytical Report for

# 221 Sunset Drive - Sitewide Investigation

## ASL Report #: Q3221
## Project ID: 681225.GW.01

**Attn: Kimberly Stokes**
cc:
Barrie Selcoe/HOU
Amy Klopper/GNV
Monica Schneider/STL

Authorized and Released By:

Kathy McKinley

Laboratory Project Manager
Kathy McKinley
*(541) 758-0235 ext.23144*
*October 13, 2016*

All analyses performed by CH2M HILL are clearly indicated. Any subcontracted analyses are included as appended reports as received from the subcontracted laboratory. The results included in this report only relate to the samples listed on the following Sample Cross-Reference page. This report shall not be reproduced except in full, without the written approval of the laboratory.

Any unusual difficulties encountered during the analysis of your samples are discussed in the attached case narratives.

Accredited in accordance with NELAP:
Oregon (100022)
Louisiana (05031)

CH2M - Applied Sciences Laboratory
1100 NE Circle Boulevard, Suite 300
Corvallis, Oregon 97330
www.ch2m.com

**ASL Report #: Q3221**

## Sample Receipt Comments

We certify that the test results meet all NELAP requirements.

## Sample Cross-Reference

| ASL Sample ID | Client Sample ID | Date/Time Collected | Date Received |
|---|---|---|---|
| Q322101 | MW108S-SV-10-15-101116 | 10/11/16 15:16 | 10/12/16 |

## Table of Contents

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Volatile Organics Analysis by Method TO15 ..... 6

Chain of Custody/Shipping Documents..... 26

## Data Qualifiers

| | |
|---|---|
| U | The analyte was not detected and is reported as less than the quantitation (or detection) limit. |
| J | The analyte was positively identified and is reported as an estimated value below the quantitation limit. |
| E | The analyte was positively identified and the reported result exceeded the instrument calibration range. |
| B | Blank contamination—the reported result is associated with a contaminated blank. |
| M | A matrix effect was present. |
| R | The data must be evaluated for usability due to deficiencies in the ability to analyze the sample and meet QC criteria. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain QC criteria. |
| P | The primary and confirmation analyte result recoveries do not match (dual column analysis). |

CH2MHILL
Applied Sciences Laboratory (ASL)

# Applied Sciences Group QC Codes for Raw Data Mark Up

| Code | Description |
|---|---|
| R01 | Illegible entry |
| R02 | Unnecessary entry |
| R03 | Typo |
| R04 | Misspelled |
| R05 | Page mis-numbered |
| R06 | Transcription error or incorrect entry |
| R07 | Rounding error |
| R08 | Unused code |
| R09 | Unused code |
| R10 | Wrong date entered |
| R11 | Wrong sample number |
| R12 | Wrong dilution factor |
| R13 | Wrong concentration |
| R14 | Wrong batch number |
| R15 | Wrong standard concentration |
| R16 | Wrong standard lot # |
| R17 | Remake of standards |
| R18 | Unused code |
| R19 | Unused code |
| R20 | Re-calibration of equipment |
| R21 | Sample rerun |
| R22 | Miscalculation |
| R23 | Wrong detection limit given |
| R24 | Less than reporting limit |
| R25 | Non-target compound |
| R26 | Less than detection limit |
| R27 | Unused code |
| R28 | Includes dilution factor |
| R29 | Sample relogged-in under a different work order |
| R30 | Equipment malfunction |
| R31 | Unused code |
| R32 | Unused code |
| R33 | Manual integration of qualifying ion only |
| R34 | Software split peak |
| R35 | Software included interfering peak |
| R37 | Peak area enhanced by software |
| R38 | Peak area excluded by software |
| R39 | Peak misidentification by software |
| R40 | Delete baseline noise |
| R41 | Unused code |
| R42 | Unused code |
| R43 | Unused code |
| R44 | Reanalysis due to the failure of an ISTD |
| R45 | Analysis didn't acquire |

# ANALYSIS METHOD

# TO15

*1100 NE Circle Blvd., Suite 300*
*Corvallis, OR 97330*
*Tel 541-768-3120 Fax 541-752-0276*

# CASE NARRATIVE
# GC/MS VOLATILES ANALYSIS

**Lab Name:** CH2M ASL **ASL SDG#:** Q3221

**Project:** 221 Sunset Drive **Project #:** 669272.16.01

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

**Method(s):**
TO15

**Internal Standard(s):**
Internal standard area count for CV1-1012 was low, causing method blank, blank spike and samples to fall outside QC limits. LPM approved data reporting due to 24hr TAT.

# CH2M Applied Sciences Laboratory (ASL)

## Air Canister Dilution Record

| Sample ID | Client ID | Date Collected | Time Collected | Canister ID | Certification Date | Incoming pressure inHG | Incoming pressure torr | Primary Dilution Factor | Sample Aliquot (mL) |
|---|---|---|---|---|---|---|---|---|---|
| Q322101 | MW108S-SV-10-15-101116 | 10/11/2016 | 15:16 | SG1463 | 7/7/2016 | 7.6 | 567 | 2.15 | 20.00 |

## CH2M Applied Sciences Laboratory (ASL)

**Date Pressurized:** 10/12/2016

**Time Pressurized:** 10:52

### Air Canister Primary Dilution Log

| Sample ID | Analyst | Dilution Gas | Can Type (6000mL, 850mL) | Canister ID | Flow Controller ID | Initial Pressure (Torr) | Final Pressure (Torr) | Primary Dilution Factor | DF corrected for helium |
|---|---|---|---|---|---|---|---|---|---|
| Q322101AIR1 | RS | Nitrogen | 850mL | SG1463 | FC3989B | 567 | 1219 | 2.15 | |

# SAMPLE DATA SUMMARY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW108S-SV-10-15-101116**

SDG No.: Q3221

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q322101

Lab File ID: Q322101.D

Level: (LOW/MED) LOW

Date Received: 10/12/16

Date Analyzed: 10/12/16

Dilution Factor: 26.88

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 10.5 | 34.8 | 34.8 | U |
| 75-35-4 | 1,1-Dichloroethene | 16.3 | 54.0 | 54.0 | U |
| 75-09-2 | Methylene chloride | 14.2 | 474 | 474 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 16.3 | 54.0 | 54.0 | U |
| 75-34-3 | 1,1-Dichloroethane | 16.6 | 55.2 | 55.2 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 16.3 | 54.0 | 54.0 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 22.4 | 74.4 | 74.4 | U |
| 79-01-6 | Trichloroethene (TCE) | 22.0 | 73.2 | 5260 | |
| 127-18-4 | Tetrachloroethene (PCE) | 27.8 | 92.4 | 92.4 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**XB1-1012**

SDG No.: Q3221

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: XB1-1012

Lab File ID: XB1-1012.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 10/12/16

Dilution Factor: 1

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 0.390 | 1.30 | 1.30 | U |
| 75-35-4 | 1,1-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-09-2 | Methylene chloride | 0.530 | 17.7 | 17.7 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-34-3 | 1,1-Dichloroethane | 0.618 | 2.06 | 2.06 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 0.833 | 2.77 | 2.77 | U |
| 79-01-6 | Trichloroethene (TCE) | 0.819 | 2.73 | 2.73 | U |
| 127-18-4 | Tetrachloroethene (PCE) | 1.03 | 3.45 | 3.45 | U |

# QC SUMMARY

2A

AIR VOLATILE SURROGATE RECOVERY

SDG No.: Q3221 Lab Name: CH2M ASL

Analysis Method: TO15

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| | Field/QC Sample ID | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | # Out |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BS1X-1012 | 89 | 116 | | | | | | | | | | | |
| 2 | XB1-1012 | 91 | 103 | | | | | | | | | | | |
| 3 | MW108S-SV-10-15-101116 | 88 | 99 | | | | | | | | | | | |
| 4 | MW108S-SV-10-15-101116D | 101 | 97 | | | | | | | | | | | |

* Values outside of QC limits

D Surrogate diluted out

| | | QC Limits |
|---|---|---|
| S1: | Toluene-d8 | (70-130) |
| S2: | 4-Bromofluorobenzene | (70-130) |

# AIR VOLATILE BLANK SPIKE RECOVERY

SDG No.: Q3221 Lab Name: CH2M ASL

Analysis Method: TO15 Blank Spike ID: BS1X-1012

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| Analyte | Spike Added (UG/M3) | BS Result (UG/M3) | %R | QC Limits %R | Q |
|---|---|---|---|---|---|
| Vinyl Chloride | 78.0 | 58.0 | 74 | 70-130 | |
| 1,1-Dichloroethene | 121 | 123 | 102 | 70-130 | |
| Methylene chloride | 106 | 119 | 112 | 70-130 | |
| 1,1-Dichloroethane | 124 | 117 | 95 | 70-130 | |
| cis-1,2-Dichloroethene | 121 | 133 | 110 | 70-130 | |
| 1,1,1-Trichloroethane | 167 | 172 | 103 | 70-130 | |
| Trichloroethene (TCE) | 164 | 170 | 104 | 70-130 | |
| Tetrachloroethene (PCE) | 207 | 206 | 99 | 70-130 | |
| trans-1,2-Dichloroethene | 121 | 127 | 105 | 70-130 | |

* Values outside of QC limits

Comments:

4A

AIR VOLATILE METHOD BLANK SUMMARY

Field Sample ID:

XB1-1012

SDG No.: Q3221

Lab Name: CH2M ASL

Analysis Method: TO15

Lab Sample ID: XB1-1012

Lab File ID: XB1-1012.D

Date Analyzed: 10/12/16

GC Column: ZB-624 ID: 0.25 (mm)

Time Analyzed: 1540

Instrument Name: MSAA

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | BS1X-1012 | BS1X-1012 | BS1X-1012.D | 10/12/16 | 1457 |
| 2 | MW108S-SV-10-15-101116 | Q322101 | Q322101.D | 10/12/16 | 1624 |
| 3 | MW108S-SV-10-15-101116D | Q322101D | Q322101D.D | 10/12/16 | 1707 |

Comments:

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3221 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 08/26/16

Lab File ID: T1-0826.D BFB Injection Time: 1532

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | Q |
|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 35016 (20.4) | |
| 75 | 30% to 60% of mass 95 | 82680 (48.2) | |
| 95 | base peak, 100% relative abundance | 171648 (100.0) | |
| 96 | 5% to 9% of mass 95 | 10400 (6.1) | |
| 173 | 0% to less than 2% of mass 174 | 1199 (0.8) | |
| 174 | greater than 50% of mass 95 | 146240 (85.2) | |
| 175 | 5% to 9% of mass 174 | 11159 (7.6) | |
| 176 | >95%, but <101% of mass 174 | 146752 (100.4) | |
| 177 | 5% to 9% of mass 176 | 8963 (6.1) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | LEVEL5 | LEVEL5 | LEVEL5.D | 08/26/16 | 1532 |
| 2 | LEVEL6 | LEVEL6 | LEVEL6.D | 08/26/16 | 1615 |
| 3 | LEVEL7 | LEVEL7 | LEVEL7.D | 08/26/16 | 1658 |
| 4 | LEVEL4 | LEVEL4 | LEVEL4.D | 08/26/16 | 1741 |
| 5 | LEVEL3 | LEVEL3 | LEVEL3.D | 08/26/16 | 1824 |
| 6 | LEVEL2 | LEVEL2 | LEVEL2.D | 08/26/16 | 1906 |
| 7 | LEVEL1 | LEVEL1 | LEVEL1.D | 08/26/16 | 1949 |
| 8 | ICV-0826 | ICV-0826 | ICV-0826.D | 08/26/16 | 2032 |

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3221 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 10/12/16

Lab File ID: T1-1012.D BFB Injection Time: 1420

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | Q |
|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 16760 (19.8) | |
| 75 | 30% to 60% of mass 95 | 42591 (50.3) | |
| 95 | base peak, 100% relative abundance | 84600 (100.0) | |
| 96 | 5% to 9% of mass 95 | 5234 (6.2) | |
| 173 | 0% to less than 2% of mass 174 | 816 (1.0) | |
| 174 | greater than 50% of mass 95 | 79312 (93.7) | |
| 175 | 5% to 9% of mass 174 | 5544 (7.0) | |
| 176 | >95%, but <101% of mass 174 | 80016 (100.9) | |
| 177 | 5% to 9% of mass 176 | 5241 (6.5) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | CV1-1012 | CV1-1012 | CV1-1012.D | 10/12/16 | 1420 |
| 2 | BS1X-1012 | BS1X-1012 | BS1X-1012.D | 10/12/16 | 1457 |
| 3 | XB1-1012 | XB1-1012 | XB1-1012.D | 10/12/16 | 1540 |
| 4 | MW108S-SV-10-15-101116 | Q322101 | Q322101.D | 10/12/16 | 1624 |
| 5 | MW108S-SV-10-15-101116D | Q322101D | Q322101D.D | 10/12/16 | 1707 |

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3221

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N) N

Concentration Units: ppbv

| ICAL Sample IDs: | LEVEL1 | LEVEL2 | LEVEL3 | LEVEL4 | LEVEL5 | LEVEL6 |
|---|---|---|---|---|---|---|
| ICAL File IDs: | LEVEL1.D | LEVEL2.D | LEVEL3.D | LEVEL4.D | LEVEL5.D | LEVEL6.D |

| Analyte | Std 1 | RF 1 | Std 2 | RF 2 | Std 3 | RF 3 | Std 4 | RF 4 | Std 5 | RF 5 | Std 6 | RF 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Vinyl Chloride | .5 | 0.793 | 1 | 0.925 | 5 | 0.831 | 20 | 0.673 | 30 | 0.697 | 50 | 0.680 |
| 1,1-Dichloroethene | .5 | 1.422 | 1 | 1.506 | 5 | 1.326 | 20 | 1.178 | 30 | 1.207 | 50 | 1.183 |
| Methylene chloride | .5 | 1.213 | 1 | 1.225 | 5 | 0.944 | 20 | 0.829 | 30 | 0.865 | 50 | 0.861 |
| trans-1,2-Dichloroethene | .5 | 0.950 | 1 | 1.156 | 5 | 1.104 | 20 | 1.040 | 30 | 1.098 | 50 | 1.090 |
| 1,1-Dichloroethane | .5 | 1.609 | 1 | 1.659 | 5 | 1.370 | 20 | 1.280 | 30 | 1.321 | 50 | 1.304 |
| cis-1,2-Dichloroethene | .5 | 1.031 | 1 | 1.148 | 5 | 1.010 | 20 | 0.960 | 30 | 1.003 | 50 | 0.997 |
| 1,1,1-Trichloroethane | .5 | 2.416 | 1 | 2.480 | 5 | 2.023 | 20 | 1.755 | 30 | 1.847 | 50 | 1.813 |
| 1,4-difluorobenzene | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Trichloroethene (TCE) | .5 | 0.321 | 1 | 0.296 | 5 | 0.283 | 20 | 0.248 | 30 | 0.252 | 50 | 0.250 |
| Toluene-d8 | 10 | 0.903 | 10 | 0.903 | 10 | 0.897 | 10 | 0.900 | 10 | 0.897 | 10 | 0.913 |
| Tetrachloroethene (PCE) | .5 | 0.472 | 1 | 0.447 | 5 | 0.431 | 20 | 0.363 | 30 | 0.364 | 50 | 0.359 |
| Chlorobenzene-d5 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| 4-Bromofluorobenzene | 10 | 0.465 | 10 | 0.484 | 10 | 0.504 | 10 | 0.514 | 10 | 0.513 | 10 | 0.525 |

@ SPCC # CCC

# VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3221

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N) N

Concentration Units: ppbv

ICAL Sample IDs: LEVEL7

ICAL File IDs: LEVEL7.D

| Analyte | Std 7 | RF 7 | Std 8 | RF 8 | Std 9 | RF 9 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | | | | | | | | | | |
| Vinyl Chloride | 100 | 0.658 | | | | | | | | | | |
| 1,1-Dichloroethene | 100 | 1.120 | | | | | | | | | | |
| Methylene chloride | 100 | 0.838 | | | | | | | | | | |
| trans-1,2-Dichloroethene | 100 | 1.063 | | | | | | | | | | |
| 1,1-Dichloroethane | 100 | 1.272 | | | | | | | | | | |
| cis-1,2-Dichloroethene | 100 | 0.955 | | | | | | | | | | |
| 1,1,1-Trichloroethane | 100 | 1.747 | | | | | | | | | | |
| 1,4-difluorobenzene | 10 | 1.000 | | | | | | | | | | |
| Trichloroethene (TCE) | 100 | 0.240 | | | | | | | | | | |
| Toluene-d8 | 10 | 0.904 | | | | | | | | | | |
| Tetrachloroethene (PCE) | 100 | 0.340 | | | | | | | | | | |
| Chlorobenzene-d5 | 10 | 1.000 | | | | | | | | | | |
| 4-Bromofluorobenzene | 10 | 0.533 | | | | | | | | | | |

@ SPCC # CCC

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3221 | Lab Name: CH2M ASL

Analysis Method: TO15 | Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA | Calibration Times: 1532 1949

Heat Purge: (Y/N)N | Concentration Units: ppbv

| Analyte | Curve Type | Avg. RF | %RSD | r | COD | Q |
|---|---|---|---|---|---|---|
| Bromochloromethane | AVG | 1.000 | 0.00 | | | |
| Vinyl Chloride | AVG | 0.751 | 13.4 | | | |
| 1,1-Dichloroethene | AVG | 1.277 | 11.3 | | | |
| Methylene chloride | LINR | 0.968 | | 0.999 | | |
| trans-1,2-Dichloroethene | AVG | 1.072 | 6.05 | | | |
| 1,1-Dichloroethane | AVG | 1.402 | 11.6 | | | |
| cis-1,2-Dichloroethene | AVG | 1.015 | 6.37 | | | |
| 1,1,1-Trichloroethane | AVG | 2.011 | 15.5 | | | |
| 1,4-difluorobenzene | AVG | 1.000 | 0.00 | | | |
| Trichloroethene (TCE) | AVG | 0.270 | 11.2 | | | |
| Toluene-d8 | AVG | 0.902 | 0.61 | | | |
| Tetrachloroethene (PCE) | AVG | 0.396 | 13.1 | | | |
| Chlorobenzene-d5 | AVG | 1.000 | 0.00 | | | |
| 4-Bromofluorobenzene | AVG | 0.505 | 4.69 | | | |

@ SPCC # CCC

# VOLATILE INITIAL CALIBRATION CHECK

SDG No.: Q3221

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 08/26/16 2032

Instrument ID: MSAA

Init. Calib. Date(s): 08/26/16 08/26/16

2nd Source ICV-0826

Init. Calib. Time(s): 1532 1949

Lab File ID: ICV-0826.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 29.6 | 0.741 | 0.000 | -1 | 30 | |
| 1,1-Dichloroethene | 30.0 | 30.4 | 1.296 | 0.000 | 1 | 30 | |
| Methylene chloride | 30.0 | 33.9 | 0.961 | 0.000 | 13 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 30.5 | 1.090 | 0.000 | 2 | 30 | |
| 1,1-Dichloroethane | 30.0 | 28.8 | 1.348 | 0.000 | -4 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 32.4 | 1.095 | 0.000 | 8 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 29.4 | 1.974 | 0.000 | -2 | 30 | |
| Trichloroethene (TCE) | 30.0 | 29.7 | 0.267 | 0.000 | -1 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 28.7 | 0.379 | 0.000 | -4 | 30 | |

* SPCC # CCC

7A

VOLATILE CONTINUING CALIBRATION CHECK

SDG No.: Q3221

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 10/12/16 1420

Instrument ID: MSAA

Init. Calib. Date(s): 08/26/16 08/26/16

Cal Check ID: CV1-1012

Init. Calib. Time(s): 1532 1949

Lab File ID: CV1-1012.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 26.8 | 0.671 | 0.000 | -11 | 30 | |
| 1,1-Dichloroethene | 30.0 | 31.8 | 1.355 | 0.000 | 6 | 30 | |
| Methylene chloride | 30.0 | 29.7 | 0.843 | 0.000 | -1 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 31.2 | 1.113 | 0.000 | 4 | 30 | |
| 1,1-Dichloroethane | 30.0 | 27.6 | 1.292 | 0.000 | -8 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 33.4 | 1.129 | 0.000 | 11 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 36.3 | 2.437 | 0.000 | 21 | 30 | |
| Trichloroethene (TCE) | 30.0 | 32.9 | 0.296 | 0.000 | 10 | 30 | |
| Toluene-d8 | 10.0 | 10.2 | 0.917 | 0.000 | 2 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 34.8 | 0.459 | 0.000 | 16 | 30 | |
| 4-Bromofluorobenzene | 10.0 | 12.5 | 0.631 | 0.000 | 25 | 30 | |

* SPCC # CCC

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3221

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: LEVEL5 | Date Analyzed: 08/26/16

Lab File ID: LEVEL5.D | Time Analyzed: 1532

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 291021 | 14.62 | 1203115 | 16.29 | 987506 | 20.57 |
| | Upper Limit | 407429 | 15.12 | 1684361 | 16.79 | 1382508 | 21.07 |
| | Lower Limit | 174613 | 14.12 | 721869 | 15.79 | 592504 | 20.07 |
| Field Sample ID | Lab Sample ID | | | | | | |
| ICV-0826 | ICV-0826 | 290536 | 14.62 | 1157423 | 16.3 | 971840 | 20.57 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3221

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: CV1-1012 | Date Analyzed: 10/12/16

Lab File ID: CV1-1012.D | Time Analyzed: 1420

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 163296 | 14.62 | 649725 | 16.29 | 575410 | 20.57 |
| | Upper Limit | 228614 | 15.12 | 909615 | 16.79 | 805574 | 21.07 |
| | Lower Limit | 97978 | 14.12 | 389835 | 15.79 | 345246 | 20.07 |
| Field Sample ID | Lab Sample ID | | | | | | |
| BS1X-1012 | BS1X-1012 | 258575* | 14.62 | 1020420* | 16.29 | 867053* | 20.56 |
| XB1-1012 | XB1-1012 | 253415* | 14.60 | 991602* | 16.28 | 832021* | 20.56 |
| MW108S-SV-10-15-1011 | Q322101 | 243332* | 14.60 | 984827* | 16.27 | 823601* | 20.56 |
| MW108S-SV-10-15-1011 | Q322101D | 238558* | 14.60 | 961531* | 16.28 | 806169* | 20.56 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

# CHAIN OF CUSTODY/SHIPPING DOCUMENTS

Q 3221

ch2m

12750 Ment Drive Suite 1100
Dallas, TX
Tel No: (352) 384-7002
Fax No: (352) 214-2814

# CHAIN-OF-CUSTODY RECORD

COC NUMBER: 681225-1

| | | | | |
|---|---|---|---|---|
| PROJECT NAME | PROJECT NUMBER | LAB NAME AND CONTACT | FAX AND MAIL REPORTS TO (RECIPIENT 1 (Name and Company)) | RECIPIENT 1 (Address, Tel No. and Fax No.) |
| 221 Sunset Drive | 681225.GW.01 | Applied Sciences Lab<br>Kathy McKinley, Lab PM | Amy Klopper/CH2M<br>amy.klopper@ch2m.com | |
| PROJECT PHASE/ATTIVITY | CTO OR DO NUMBER | LAB PO NUMBER | FAX AND MAIL REPORTS TO (RECIPIENT 1 (Name and Company)) | RECIPIENT 2 (Address, Tel No. and Fax No.) |
| Residential Vi Sampling 2016 | | NA | Barrie Selcoe/CH2M<br>barrie.selcoe@ch2m.com | Monica Schneider/CH2M<br>monica.schneider@ch2m.com |
| PROJECT CONTACT | PROJECT TEL NO AND FAX NO | LAB TEL NO AND FAX NO | FAX AND MAIL REPORTS TO (RECIPIENT 1 (Name and Company)) | RECIPIENT 1 (Address, Tel No. and Fax No.) |
| Kimberly Stokes | Phone: 214-998-4839 | Phone: 541-768-3144 | Kimberly Stokes/CH2M kimberly.stokes@ch2m.com | email |

| 17 ITEM | 19 SAMPLE ID | 20 MATRIX (see codes on SOP) | 21 DATE AND TIME START | 21 DATE AND TIME STOP | 22 CANISTER VACUUM IN FIELD, HG (START) | 23 CANISTER VACUUM IN FIELD, HG (STOP) | FLOW CONTROLLER ID | CANISTER ID | 23 DATA PKG LEVEL (see codes on SOP) | 24 TAT (calendar days) | TO-15 Scan | TO-15 SIM | 26 SAMPLE TYPE (see codes on SOP) | 27 LAB ID (for lab's use) | 28 COMMENTS/ SCREENING READINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MW108S-SV-10-15-101116 | SV | 10/11/16 15:11 | 10/11/16 15:16 | 28.84 | 5.58 | FC3989B | SG1463 | | 24 Hour | X | | | | 24 Hour TAT |
| 2 | | | | | | | | | | | | | | | |
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SAMPLER(S) AND COMPANY (please print):

Field Notes & Special Instructions: Select VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, methylene chloride, PCE, TCE, and vinyl chloride)

SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (to lab use): 22.6°C

| RELINQUISHED BY (Printed Name and Signature) | DATE | TIME | RECEIVED BY (Printed Name and Signature) | DATE | TIME |
|---|---|---|---|---|---|
| Zach Dolbec | 10/11/16 | | | 10/12/16 | 1000 |

Distribution: [ x ] Original - Laboratory (To be returned with Analytical Report) [ ] Copy 1 - Project File [ ] Copy 2 - PMO

Form CC001, Rev 08-00

Tracking: 1Z 2E7 R78 01 8344 8342

1

# CH2M Applied Sciences Laboratory

## Sample Receipt Record

SDG ID: Q3221 Date Received: 10/12/2016

Client/Project: 221 Sunset Drive Received by: PC

| | | | |
|---|---|---|---|
| Were custody seals intact and on the outside of the cooler? | ☑ Yes | ☐ No | ☐ N/A |
| Shipping Record: | ☐ Hand Delivered | ☐ On File | ☑ COC |
| Radiological Screening for DoD | ☐ Yes | ☐ No | ☑ N/A |
| Packing Material: | ☐ Hand Delivered | ☐ Ice | ☐ Blue Ice ☑ Box |
| Temp OK? (<6C) Therm ID: TH173 Exp. 10/16/16 | 22.6°C | ☐ Yes | ☐ No ☑ N/A |
| Was a Chain of Custody (CoC) Provided? | ☑ Yes | ☐ No | ☐ N/A |
| Was the CoC correctly filled out (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did sample labels agree with COC? (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did the CoC list a correct bottle count and the preservative types (No=Correct on CoC) | ☑ Yes | ☐ No | ☐ N/A |
| Were the sample containers in good condition (not broken or leaking)? | ☑ Yes | ☐ No | ☐ N/A |
| Was enough sample volume provided for analysis? (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Containers supplied by ASL? | ☑ Yes | ☐ No | ☐ N/A |
| Any sample with < 1/2 holding time remaining? If so contact LPM and document below. | ☐ Yes | ☑ No | ☐ N/A |
| Samples have multi-phase? If yes, document on SRER | ☐ Yes | ☑ No | ☐ N/A |
| All water VOCs free of air bubbles? No, document on SRER | ☐ Yes | ☐ No | ☑ N/A |
| pH of all samples met criteria on receipt? If "No", preserve and document below. | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals filtered in the field? | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals have sediment in bottom of container? If so document below. | ☐ Yes | ☐ No | ☑ N/A |

### Preservation Adjustment

| Sample ID | Reagent | Reagent Lot Number | Volume Added | Initials/Date-Time | 24 hour pH check Initials/Time |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

Did pH of all metals samples preserved upon receipt meet criteria 24 hours after preservation? ☐ Yes ☐ No

### Sample Exception Report (The following exceptions were noted)

Client was notified on: Client contact:

Resolution to Exception:

# Analytical Report for

# 221 Sunset Drive

## ASL Report #: Q3255
## Project ID: 681225.GW.01

**Attn: Kimberly Stokes**

cc:
Barrie Selcoe/HOU
Amy Klopper/GNV
Monica Schneider/STL

Authorized and Released By:

Kathy McKinley

Laboratory Project Manager
Kathy McKinley
*(541) 758-0235 ext.23144*
*October 14, 2016*

All analyses performed by CH2M HILL are clearly indicated. Any subcontracted analyses are included as appended reports as received from the subcontracted laboratory. The results included in this report only relate to the samples listed on the following Sample Cross-Reference page. This report shall not be reproduced except in full, without the written approval of the laboratory.

Any unusual difficulties encountered during the analysis of your samples are discussed in the attached case narratives.

Accredited in accordance with NELAP:
Oregon (100022)
Louisiana (05031)

CH2M - Applied Sciences Laboratory
1100 NE Circle Boulevard, Suite 300
Corvallis, Oregon 97330
www.ch2m.com

**ASL Report #: Q3255**

## Sample Receipt Comments

We certify that the test results meet all NELAP requirements.

## Sample Cross-Reference

| ASL Sample ID | Client Sample ID | Date/Time Collected | Date Received |
|---|---|---|---|
| Q325501 | MW116D-SV-20-30-101216 | 10/12/16 08:25 | 10/14/16 |
| Q325502 | MW116S-SV-10-15-101216 | 10/12/16 08:57 | 10/14/16 |
| Q325503 | MW115D-SV-25-35-101316 | 10/13/16 09:50 | 10/14/16 |

## Table of Contents

**Page**

Volatile Organics Analysis by Method TO15 ..... 6

Chain of Custody/Shipping Documents..... 29

## Data Qualifiers

| | |
|---|---|
| U | The analyte was not detected and is reported as less than the quantitation (or detection) limit. |
| J | The analyte was positively identified and is reported as an estimated value below the quantitation limit. |
| E | The analyte was positively identified and the reported result exceeded the instrument calibration range. |
| B | Blank contamination—the reported result is associated with a contaminated blank. |
| M | A matrix effect was present. |
| R | The data must be evaluated for usability due to deficiencies in the ability to analyze the sample and meet QC criteria. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain QC criteria. |
| P | The primary and confirmation analyte result recoveries do not match (dual column analysis). |

CH2MHILL
Applied Sciences Laboratory (ASL)

# Applied Sciences Group QC Codes for Raw Data Mark Up

| Code | Description |
|---|---|
| R01 | Illegible entry |
| R02 | Unnecessary entry |
| R03 | Typo |
| R04 | Misspelled |
| R05 | Page mis-numbered |
| R06 | Transcription error or incorrect entry |
| R07 | Rounding error |
| R08 | Unused code |
| R09 | Unused code |
| R10 | Wrong date entered |
| R11 | Wrong sample number |
| R12 | Wrong dilution factor |
| R13 | Wrong concentration |
| R14 | Wrong batch number |
| R15 | Wrong standard concentration |
| R16 | Wrong standard lot # |
| R17 | Remake of standards |
| R18 | Unused code |
| R19 | Unused code |
| R20 | Re-calibration of equipment |
| R21 | Sample rerun |
| R22 | Miscalculation |
| R23 | Wrong detection limit given |
| R24 | Less than reporting limit |
| R25 | Non-target compound |
| R26 | Less than detection limit |
| R27 | Unused code |
| R28 | Includes dilution factor |
| R29 | Sample relogged-in under a different work order |
| R30 | Equipment malfunction |
| R31 | Unused code |
| R32 | Unused code |
| R33 | Manual integration of qualifying ion only |
| R34 | Software split peak |
| R35 | Software included interfering peak |
| R37 | Peak area enhanced by software |
| R38 | Peak area excluded by software |
| R39 | Peak misidentification by software |
| R40 | Delete baseline noise |
| R41 | Unused code |
| R42 | Unused code |
| R43 | Unused code |
| R44 | Reanalysis due to the failure of an ISTD |
| R45 | Analysis didn't acquire |

# ANALYSIS METHOD

# TO15

*1100 NE Circle Blvd., Suite 300*
*Corvallis, OR 97330*
*Tel 541-768-3120 Fax 541-752-0276*

# CASE NARRATIVE
# GC/MS VOLATILES ANALYSIS

**Lab Name:** CH2M ASL **ASL SDG#:** Q3255

**Project:** 221 Sunset Drive **Project #:** 681225.GW.01

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

**Method(s):**
TO15

# CH2M Applied Sciences Laboratory (ASL)

## Air Canister Dilution Record

| Sample ID | Client ID | Date Collected | Time Collected | Canister ID | Certification Date | Incoming pressure inHG | Incoming pressure torr | Primary Dilution Factor | Sample Aliquot (mL) |
|---|---|---|---|---|---|---|---|---|---|
| Q325501 | MW116D-SV-20-30-101216 | 10/12/2016 | 08:25 | SG1766 | 8/11/2016 | 6.9 | 585 | 2.08 | 168.00 |
| Q325502 | MW116S-SV-10-15-101216 | 10/12/2016 | 08:57 | SG1755 | 8/11/2016 | 5.6 | 618 | 1.97 | 20.00 |
| Q325503 | MW115D-SV-25-35-101316 | 10/13/2016 | 09:50 | SG1679 | 8/12/2016 | 7.2 | 576 | 2.13 | 20.00 |

# CH2M Applied Sciences Laboratory (ASL)

## Air Canister Primary Dilution Log

| Sample ID | Analyst | Date & Time | Dilution Gas | Previous Dilution Factor | Initial Pressure (Torr) | Final Pressure (Torr) | Secondary Dilution Factor |
|---|---|---|---|---|---|---|---|
| Q325501AIR1 | CRS | 10/14/16 11:03 | Nitrogen | 2.08 | 97 | 1785 | 38.28 |
| Q325501AIR2 | CRS | 10/14/16 11:03 | Nitrogen | 38.28 | 1322 | 1729 | 50.06 |
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# SAMPLE DATA SUMMARY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW116D-SV-20-30-101216**

SDG No.: Q3255

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q325501

Lab File ID: Q325501.D

Level: (LOW/MED) LOW

Date Received: 10/14/16

Date Analyzed: 10/14/16

Dilution Factor: 74.55

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 29.1 | 97.0 | 97.0 | U |
| 75-35-4 | 1,1-Dichloroethene | 45.2 | 150 | 150 | U |
| 75-09-2 | Methylene chloride | 39.6 | 1320 | 1320 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 45.2 | 150 | 150 | U |
| 75-34-3 | 1,1-Dichloroethane | 46.1 | 154 | 154 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 45.2 | 150 | 150 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 62.2 | 207 | 207 | U |
| 79-01-6 | Trichloroethene (TCE) | 61.2 | 204 | 31400 | |
| 127-18-4 | Tetrachloroethene (PCE) | 77.3 | 257 | 257 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW116S-SV-10-15-101216**

SDG No.: Q3255

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q325502

Lab File ID: Q325502.D

Level: (LOW/MED) LOW

Date Received: 10/14/16

Date Analyzed: 10/14/16

Dilution Factor: 24.63

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 9.59 | 32.0 | 32.0 | U |
| 75-35-4 | 1,1-Dichloroethene | 14.9 | 49.6 | 49.6 | U |
| 75-09-2 | Methylene chloride | 13.0 | 435 | 435 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 14.9 | 49.6 | 49.6 | U |
| 75-34-3 | 1,1-Dichloroethane | 15.2 | 50.6 | 50.6 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 14.9 | 49.6 | 49.6 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 20.5 | 68.3 | 68.3 | U |
| 79-01-6 | Trichloroethene (TCE) | 20.2 | 67.2 | 8680 | |
| 127-18-4 | Tetrachloroethene (PCE) | 25.5 | 84.9 | 39.1 | J |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW115D-SV-25-35-101316**

SDG No.: Q3255

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q325503

Lab File ID: Q325503.D

Level: (LOW/MED) LOW

Date Received: 10/14/16

Date Analyzed: 10/14/16

Dilution Factor: 26.63

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 10.4 | 34.6 | 34.6 | U |
| 75-35-4 | 1,1-Dichloroethene | 16.1 | 53.6 | 53.6 | U |
| 75-09-2 | Methylene chloride | 14.1 | 470 | 470 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 16.1 | 53.6 | 53.6 | U |
| 75-34-3 | 1,1-Dichloroethane | 16.4 | 54.8 | 54.8 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 16.1 | 53.6 | 53.6 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 22.1 | 73.8 | 73.8 | U |
| 79-01-6 | Trichloroethene (TCE) | 21.8 | 72.6 | 8030 | |
| 127-18-4 | Tetrachloroethene (PCE) | 27.5 | 91.8 | 91.8 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**XB1-1014**

SDG No.: Q3255

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: XB1-1014

Lab File ID: XB1-1014.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 10/14/16

Dilution Factor: 1

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 0.390 | 1.30 | 1.30 | U |
| 75-35-4 | 1,1-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-09-2 | Methylene chloride | 0.530 | 17.7 | 17.7 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-34-3 | 1,1-Dichloroethane | 0.618 | 2.06 | 2.06 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 0.833 | 2.77 | 2.77 | U |
| 79-01-6 | Trichloroethene (TCE) | 0.819 | 2.73 | 2.73 | U |
| 127-18-4 | Tetrachloroethene (PCE) | 1.03 | 3.45 | 3.45 | U |

# QC SUMMARY

2A

AIR VOLATILE SURROGATE RECOVERY

SDG No.: Q3255 Lab Name: CH2M ASL

Analysis Method: TO15

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| | Field/QC Sample ID | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | # Out |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BS1X-1014 | 101 | 126 | | | | | | | | | | | |
| 2 | XB1-1014 | 99 | 115 | | | | | | | | | | | |
| 3 | MW116D-SV-20-30-101216 | 99 | 116 | | | | | | | | | | | |
| 4 | MW116D-SV-20-30-101216D | 99 | 115 | | | | | | | | | | | |
| 5 | MW116S-SV-10-15-101216 | 100 | 111 | | | | | | | | | | | |
| 6 | MW115D-SV-25-35-101316 | 100 | 114 | | | | | | | | | | | |

* Values outside of QC limits

D Surrogate diluted out

| | | QC Limits |
|---|---|---|
| S1: | Toluene-d8 | (70-130) |
| S2: | 4-Bromofluorobenzene | (70-130) |

3B

AIR VOLATILE BLANK SPIKE RECOVERY

SDG No.: Q3255 Lab Name: CH2M ASL

Analysis Method: TO15 Blank Spike ID: BS1X-1014

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| Analyte | Spike Added (UG/M3) | BS Result (UG/M3) | %R | QC Limits %R | Q |
|---|---|---|---|---|---|
| Vinyl Chloride | 78.0 | 70.7 | 91 | 70-130 | |
| 1,1-Dichloroethene | 121 | 123 | 102 | 70-130 | |
| Methylene chloride | 106 | 96.8 | 91 | 70-130 | |
| 1,1-Dichloroethane | 124 | 105 | 85 | 70-130 | |
| cis-1,2-Dichloroethene | 121 | 124 | 103 | 70-130 | |
| 1,1,1-Trichloroethane | 167 | 189 | 113 | 70-130 | |
| Trichloroethene (TCE) | 164 | 169 | 103 | 70-130 | |
| Tetrachloroethene (PCE) | 207 | 224 | 108 | 70-130 | |
| trans-1,2-Dichloroethene | 121 | 118 | 97 | 70-130 | |

* Values outside of QC limits

Comments:

4A

AIR VOLATILE METHOD BLANK SUMMARY

Field Sample ID:

XB1-1014

SDG No.: Q3255

Lab Name: CH2M ASL

Analysis Method: TO15

Lab Sample ID: XB1-1014

Lab File ID: XB1-1014.D

Date Analyzed: 10/14/16

GC Column: ZB-624 ID: 0.25 (mm)

Time Analyzed: 1038

Instrument Name: MSAA

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | BS1X-1014 | BS1X-1014 | BS1X-1014.D | 10/14/16 | 0954 |
| 2 | MW116D-SV-20-30-101216 | Q325501 | Q325501.D | 10/14/16 | 1133 |
| 3 | MW116D-SV-20-30-101216D | Q325501D | Q325501D.D | 10/14/16 | 1216 |
| 4 | MW116S-SV-10-15-101216 | Q325502 | Q325502.D | 10/14/16 | 1300 |
| 5 | MW115D-SV-25-35-101316 | Q325503 | Q325503.D | 10/14/16 | 1341 |

Comments:

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3255 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 08/26/16

Lab File ID: T1-0826.D BFB Injection Time: 1532

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | | Q |
|---|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 35016 | (20.4) | |
| 75 | 30% to 60% of mass 95 | 82680 | (48.2) | |
| 95 | base peak, 100% relative abundance | 171648 | (100.0) | |
| 96 | 5% to 9% of mass 95 | 10400 | (6.1) | |
| 173 | 0% to less than 2% of mass 174 | 1199 | (0.8) | |
| 174 | greater than 50% of mass 95 | 146240 | (85.2) | |
| 175 | 5% to 9% of mass 174 | 11159 | (7.6) | |
| 176 | >95%, but <101% of mass 174 | 146752 | (100.4) | |
| 177 | 5% to 9% of mass 176 | 8963 | (6.1) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | LEVEL5 | LEVEL5 | LEVEL5.D | 08/26/16 | 1532 |
| 2 | LEVEL6 | LEVEL6 | LEVEL6.D | 08/26/16 | 1615 |
| 3 | LEVEL7 | LEVEL7 | LEVEL7.D | 08/26/16 | 1658 |
| 4 | LEVEL4 | LEVEL4 | LEVEL4.D | 08/26/16 | 1741 |
| 5 | LEVEL3 | LEVEL3 | LEVEL3.D | 08/26/16 | 1824 |
| 6 | LEVEL2 | LEVEL2 | LEVEL2.D | 08/26/16 | 1906 |
| 7 | LEVEL1 | LEVEL1 | LEVEL1.D | 08/26/16 | 1949 |
| 8 | ICV-0826 | ICV-0826 | ICV-0826.D | 08/26/16 | 2032 |

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3255 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 10/14/16

Lab File ID: T1-1014.D BFB Injection Time: 0910

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | Q |
|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 28024 (20.4) | |
| 75 | 30% to 60% of mass 95 | 72584 (52.9) | |
| 95 | base peak, 100% relative abundance | 137088 (100.0) | |
| 96 | 5% to 9% of mass 95 | 8364 (6.1) | |
| 173 | 0% to less than 2% of mass 174 | 1362 (1.1) | |
| 174 | greater than 50% of mass 95 | 125248 (91.4) | |
| 175 | 5% to 9% of mass 174 | 9728 (7.8) | |
| 176 | >95%, but <101% of mass 174 | 125782 (100.4) | |
| 177 | 5% to 9% of mass 176 | 7615 (6.1) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | CV1-1014 | CV1-1014 | CV1-1014.D | 10/14/16 | 0910 |
| 2 | BS1X-1014 | BS1X-1014 | BS1X-1014.D | 10/14/16 | 0954 |
| 3 | XB1-1014 | XB1-1014 | XB1-1014.D | 10/14/16 | 1038 |
| 4 | MW116D-SV-20-30-101216 | Q325501 | Q325501.D | 10/14/16 | 1133 |
| 5 | MW116D-SV-20-30-101216D | Q325501D | Q325501D.D | 10/14/16 | 1216 |
| 6 | MW116S-SV-10-15-101216 | Q325502 | Q325502.D | 10/14/16 | 1300 |
| 7 | MW115D-SV-25-35-101316 | Q325503 | Q325503.D | 10/14/16 | 1341 |

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3255

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N) N

Concentration Units: ppbv

| ICAL Sample IDs: | LEVEL1 | LEVEL2 | LEVEL3 | LEVEL4 | LEVEL5 | LEVEL6 |
|---|---|---|---|---|---|---|
| ICAL File IDs: | LEVEL1.D | LEVEL2.D | LEVEL3.D | LEVEL4.D | LEVEL5.D | LEVEL6.D |

| Analyte | Std 1 | RF 1 | Std 2 | RF 2 | Std 3 | RF 3 | Std 4 | RF 4 | Std 5 | RF 5 | Std 6 | RF 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Vinyl Chloride | .5 | 0.793 | 1 | 0.925 | 5 | 0.831 | 20 | 0.673 | 30 | 0.697 | 50 | 0.680 |
| 1,1-Dichloroethene | .5 | 1.422 | 1 | 1.506 | 5 | 1.326 | 20 | 1.178 | 30 | 1.207 | 50 | 1.183 |
| Methylene chloride | .5 | 1.213 | 1 | 1.225 | 5 | 0.944 | 20 | 0.829 | 30 | 0.865 | 50 | 0.861 |
| trans-1,2-Dichloroethene | .5 | 0.950 | 1 | 1.156 | 5 | 1.104 | 20 | 1.040 | 30 | 1.098 | 50 | 1.090 |
| 1,1-Dichloroethane | .5 | 1.609 | 1 | 1.659 | 5 | 1.370 | 20 | 1.280 | 30 | 1.321 | 50 | 1.304 |
| cis-1,2-Dichloroethene | .5 | 1.031 | 1 | 1.148 | 5 | 1.010 | 20 | 0.960 | 30 | 1.003 | 50 | 0.997 |
| 1,1,1-Trichloroethane | .5 | 2.416 | 1 | 2.480 | 5 | 2.023 | 20 | 1.755 | 30 | 1.847 | 50 | 1.813 |
| 1,4-difluorobenzene | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Trichloroethene (TCE) | .5 | 0.321 | 1 | 0.296 | 5 | 0.283 | 20 | 0.248 | 30 | 0.252 | 50 | 0.250 |
| Toluene-d8 | 10 | 0.903 | 10 | 0.903 | 10 | 0.897 | 10 | 0.900 | 10 | 0.897 | 10 | 0.913 |
| Tetrachloroethene (PCE) | .5 | 0.472 | 1 | 0.447 | 5 | 0.431 | 20 | 0.363 | 30 | 0.364 | 50 | 0.359 |
| Chlorobenzene-d5 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| 4-Bromofluorobenzene | 10 | 0.465 | 10 | 0.484 | 10 | 0.504 | 10 | 0.514 | 10 | 0.513 | 10 | 0.525 |

@ SPCC # CCC

# VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3255

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA

Calibration Times: 1532 1949

Heat Purge: (Y/N) N

Concentration Units: ppbv

ICAL Sample IDs: LEVEL7

ICAL File IDs: LEVEL7.D

| Analyte | Std 7 | RF 7 | Std 8 | RF 8 | Std 9 | RF 9 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | | | | | | | | | | |
| Vinyl Chloride | 100 | 0.658 | | | | | | | | | | |
| 1,1-Dichloroethene | 100 | 1.120 | | | | | | | | | | |
| Methylene chloride | 100 | 0.838 | | | | | | | | | | |
| trans-1,2-Dichloroethene | 100 | 1.063 | | | | | | | | | | |
| 1,1-Dichloroethane | 100 | 1.272 | | | | | | | | | | |
| cis-1,2-Dichloroethene | 100 | 0.955 | | | | | | | | | | |
| 1,1,1-Trichloroethane | 100 | 1.747 | | | | | | | | | | |
| 1,4-difluorobenzene | 10 | 1.000 | | | | | | | | | | |
| Trichloroethene (TCE) | 100 | 0.240 | | | | | | | | | | |
| Toluene-d8 | 10 | 0.904 | | | | | | | | | | |
| Tetrachloroethene (PCE) | 100 | 0.340 | | | | | | | | | | |
| Chlorobenzene-d5 | 10 | 1.000 | | | | | | | | | | |
| 4-Bromofluorobenzene | 10 | 0.533 | | | | | | | | | | |

@ SPCC # CCC

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3255 | Lab Name: CH2M ASL

Analysis Method: TO15 | Calibration Date(s): 08/26/16 08/26/16

Instrument Name: MSAA | Calibration Times: 1532 1949

Heat Purge: (Y/N)N | Concentration Units: ppbv

| Analyte | Curve Type | Avg. RF | %RSD | r | COD | Q |
|---|---|---|---|---|---|---|
| Bromochloromethane | AVG | 1.000 | 0.00 | | | |
| Vinyl Chloride | AVG | 0.751 | 13.4 | | | |
| 1,1-Dichloroethene | AVG | 1.277 | 11.3 | | | |
| Methylene chloride | LINR | 0.968 | | 0.999 | | |
| trans-1,2-Dichloroethene | AVG | 1.072 | 6.05 | | | |
| 1,1-Dichloroethane | AVG | 1.402 | 11.6 | | | |
| cis-1,2-Dichloroethene | AVG | 1.015 | 6.37 | | | |
| 1,1,1-Trichloroethane | AVG | 2.011 | 15.5 | | | |
| 1,4-difluorobenzene | AVG | 1.000 | 0.00 | | | |
| Trichloroethene (TCE) | AVG | 0.270 | 11.2 | | | |
| Toluene-d8 | AVG | 0.902 | 0.61 | | | |
| Tetrachloroethene (PCE) | AVG | 0.396 | 13.1 | | | |
| Chlorobenzene-d5 | AVG | 1.000 | 0.00 | | | |
| 4-Bromofluorobenzene | AVG | 0.505 | 4.69 | | | |

@ SPCC # CCC

# VOLATILE INITIAL CALIBRATION CHECK

SDG No.: Q3255

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 08/26/16 2032

Instrument ID: MSAA

Init. Calib. Date(s): 08/26/16 08/26/16

2nd Source ICV-0826

Init. Calib. Time(s): 1532 1949

Lab File ID: ICV-0826.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 29.6 | 0.741 | 0.000 | -1 | 30 | |
| 1,1-Dichloroethene | 30.0 | 30.4 | 1.296 | 0.000 | 1 | 30 | |
| Methylene chloride | 30.0 | 33.9 | 0.961 | 0.000 | 13 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 30.5 | 1.090 | 0.000 | 2 | 30 | |
| 1,1-Dichloroethane | 30.0 | 28.8 | 1.348 | 0.000 | -4 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 32.4 | 1.095 | 0.000 | 8 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 29.4 | 1.974 | 0.000 | -2 | 30 | |
| Trichloroethene (TCE) | 30.0 | 29.7 | 0.267 | 0.000 | -1 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 28.7 | 0.379 | 0.000 | -4 | 30 | |

* SPCC # CCC

# VOLATILE CONTINUING CALIBRATION CHECK

SDG No.: Q3255

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 10/14/16 0910

Instrument ID: MSAA

Init. Calib. Date(s): 08/26/16 08/26/16

Cal Check ID: CV1-1014

Init. Calib. Time(s): 1532 1949

Lab File ID: CV1-1014.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 25.3 | 0.632 | 0.000 | -16 | 30 | |
| 1,1-Dichloroethene | 30.0 | 29.6 | 1.260 | 0.000 | -1 | 30 | |
| Methylene chloride | 30.0 | 27.4 | 0.779 | 0.000 | -9 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 28.7 | 1.025 | 0.000 | -4 | 30 | |
| 1,1-Dichloroethane | 30.0 | 25.3 | 1.182 | 0.000 | -16 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 30.1 | 1.019 | 0.000 | 0.4 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 32.9 | 2.207 | 0.000 | 10 | 30 | |
| Trichloroethene (TCE) | 30.0 | 30.6 | 0.275 | 0.000 | 2 | 30 | |
| Toluene-d8 | 10.0 | 10.1 | 0.911 | 0.000 | 1 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 32.0 | 0.423 | 0.000 | 7 | 30 | |
| 4-Bromofluorobenzene | 10.0 | 12.7 | 0.640 | 0.000 | 27 | 30 | |

* SPCC # CCC

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3255

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: LEVEL5 | Date Analyzed: 08/26/16

Lab File ID: LEVEL5.D | Time Analyzed: 1532

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 291021 | 14.62 | 1203115 | 16.29 | 987506 | 20.57 |
| | Upper Limit | 407429 | 15.12 | 1684361 | 16.79 | 1382508 | 21.07 |
| | Lower Limit | 174613 | 14.12 | 721869 | 15.79 | 592504 | 20.07 |
| Field Sample ID | Lab Sample ID | | | | | | |
| ICV-0826 | ICV-0826 | 290536 | 14.62 | 1157423 | 16.3 | 971840 | 20.57 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3255

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: CV1-1014 | Date Analyzed: 10/14/16

Lab File ID: CV1-1014.D | Time Analyzed: 0910

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 170378 | 14.61 | 654460 | 16.29 | 579274 | 20.56 |
| | Upper Limit | 238529 | 15.11 | 916244 | 16.79 | 810984 | 21.06 |
| | Lower Limit | 102227 | 14.11 | 392676 | 15.79 | 347564 | 20.06 |
| Field Sample ID | Lab Sample ID | | | | | | |
| BS1X-1014 | BS1X-1014 | 156286 | 14.61 | 621957 | 16.28 | 551397 | 20.56 |
| XB1-1014 | XB1-1014 | 149522 | 14.59 | 577716 | 16.27 | 491598 | 20.56 |
| MW116D-SV-20-30-1012 | Q325501 | 149460 | 14.59 | 593271 | 16.27 | 522539 | 20.56 |
| MW116D-SV-20-30-1012 | Q325501D | 155711 | 14.60 | 605127 | 16.28 | 533401 | 20.56 |
| MW116S-SV-10-15-1012 | Q325502 | 161129 | 14.60 | 625885 | 16.28 | 535648 | 20.56 |
| MW115D-SV-25-35-1013 | Q325503 | 148927 | 14.60 | 613249 | 16.28 | 535513 | 20.56 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

# CHAIN OF CUSTODY/SHIPPING DOCUMENTS

Q3255

ch2m

12750 Merit Drive Suite 1100
Dallas, TX
Tel No: (352) 384-7002
Fax No: (352) 214-2814

# CHAIN-OF-CUSTODY RECORD

COC NUMBER: 681225-1

| PROJECT NAME | PROJECT NUMBER | LAB NAME AND CONTACT | FAX AND MAIL REPORTS TO (RECIPIENT 1 (Name and Company)) | RECIPIENT 1 (Address, Tel No. and Fax No.) |
|---|---|---|---|---|
| 221 Sunset Drive | 681225.GW.01 | Applied Sciences Lab<br>Kathy McKinley, Lab PM | Amy Klopper/CH2M<br>amy.klopper@ch2m.com | |
| PROJECT PHASE/SEQ/TASK | CTO OR DO NUMBER | LAB PO NUMBER | FAX AND MAIL REPORTS TO (RECIPIENT 1 (Name and Company)) | RECIPIENT 2 (Address, Tel No. and Fax No.) |
| Residential VI Sampling 2016 | | NA | Barrie Selcoe/CH2M<br>barrie.selcoe@ch2m.com | Monica Schneider/CH2M<br>monica.schneider@ch2m.com |
| PROJECT CONTACT | PROJECT TEL NO. AND FAX NO. | LAB TEL NO. AND FAX NO. | FAX AND MAIL REPORTS TO (RECIPIENT 1 (Name and Company)) | RECIPIENT 3 (Address, Tel No. and Fax No.) |
| Kimberly Stokes | Phone: 214-998-4839 | Phone: 541-768-3144 | Kimberly Stokes/CH2M kimberly.stokes@ch2m.com | email |

| 17 ITEM | 19 SAMPLE ID | 20 MATRIX (see codes on SOP) | 21 DATE AND TIME START | 22 DATE AND TIME STOP | 23 CANISTER VACUUM IN FIELD, HG (START) | 23 CANISTER VACUUM IN FIELD, HG (STOP) | FLOW CONTROLLER ID | CANISTER ID | 23 DATA PKG LEVEL (see codes on SOP) | 24 TAT (calendar days) | TO-15 Scan | TO-15 SIM | 26 SAMPLE TYPE (see codes on SOP) | 27 LAB ID (for lab's use) | 28 COMMENTS/ SCREENING READINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MW116D-SV-20-30-101216 | SV | 10/12/16 8:20 | 10/12/16 8:25 | 28.75 | 5.91 | FC3953B | SG1766 | | 24 Hour | X | | | | 24 Hour TAT |
| 2 | MW116S-SV-10-15-101216 | SV | 10/12/16 8:52 | 10/12/16 8:57 | 28.92 | 4.72 | CO046 | SG1755 | | 24 Hour | X | | | | 24 Hour TAT |
| 3 | MW115D-SV-25-35-101316 | SV | 10/13/16 9:45 | 10/13/16 9:50 | 29.23 | 6.83 | FC3243V | SG1679 | | 24 Hour | X | | | | 24 Hour TAT |
| 4 | | | | | | | | | | | | | | | |
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SAMPLER(S) AND COMPANY (please print):

FedEx number & Special Instructions:
Select VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, methylene chloride, PCE, TCE, and vinyl chloride)

SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (see lab's note)

| RELINQUISHED BY (Print Name and Signature) | DATE | TIME | RECEIVED BY (Printed Name and Signature) | DATE | TIME |
|---|---|---|---|---|---|
| E. Dolbow | 10/13/16 | 1300 | Russell Southard | 10/14/16 | 1010 |

Distribution: [ ] Original - Lab to return (Tab to be returned with Analytical Report) [ ] Copy 1 - Project File [ ] Copy 2 - PMO

Form CO001 Rev 06/08

03.7C

Tracking: 1Z 2E7 R78 01 8347 4144

# CH2M Applied Sciences Laboratory

## Sample Receipt Record

SDG ID: Q3255 | Date Received: 10/14/2016

Client/Project: 221 Sunset Drive | Received by: PC

| | | | |
|---|---|---|---|
| Were custody seals intact and on the outside of the cooler? | ☑ Yes | ☐ No | ☐ N/A |
| Shipping Record: | ☐ Hand Delivered | ☐ On File | ☑ COC |
| Radiological Screening for DoD | ☐ Yes | ☐ No | ☑ N/A |
| Packing Material: | ☐ Hand Delivered | ☐ Ice | ☐ Blue Ice ☑ Box |
| Temp OK? (<6C) Therm ID: TH173 Exp. 10/16/16 | 23.7 °C | ☐ Yes | ☐ No ☑ N/A |
| Was a Chain of Custody (CoC) Provided? | ☑ Yes | ☐ No | ☐ N/A |
| Was the CoC correctly filled out (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did sample labels agree with COC? (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did the CoC list a correct bottle count and the preservative types (No=Correct on CoC) | ☑ Yes | ☐ No | ☐ N/A |
| Were the sample containers in good condition (not broken or leaking)? | ☑ Yes | ☐ No | ☐ N/A |
| Was enough sample volume provided for analysis? (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Containers supplied by ASL? | ☑ Yes | ☐ No | ☐ N/A |
| Any sample with < 1/2 holding time remaining? If so contact LPM and document below. | ☐ Yes | ☑ No | ☐ N/A |
| Samples have multi-phase? If yes, document on SRER | ☐ Yes | ☑ No | ☐ N/A |
| All water VOCs free of air bubbles? No, document on SRER | ☐ Yes | ☐ No | ☑ N/A |
| pH of all samples met criteria on receipt? If "No", preserve and document below. | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals filtered in the field? | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals have sediment in bottom of container? If so document below. | ☐ Yes | ☐ No | ☑ N/A |

### Preservation Adjustment

| Sample ID | Reagent | Reagent Lot Number | Volume Added | Initials/Date-Time | 24 hour pH check Initials/Time |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

Did pH of all metals samples preserved upon receipt meet criteria 24 hours after preservation? ☐ Yes ☐ No

### Sample Exception Report (The following exceptions were noted)

Client was notified on: Client contact:

Resolution to Exception:

**CH2M Applied Sciences Laboratory (ASL)**

1100 NE Circle Blvd, Suite 300, Corvallis, OR 97330

**Tel 541.768.3120** Email: asl@ch2m.com

# Amended Report

| | | | |
|---|---|---|---|
| Date: | 12/29/16 | Client: | 221 Sunset |
| SDG No.: | Q3277 | Project/Task: | |
| Revision No.: | 2 | Completed by: | CH |
| Affected Method(s): | TO-15 SCAN | Approved by: | KJM |

**Amendment(s) Completed and Reason(s):**

Client requested change of Field IDs

**Amendment(s) Justification:**

| | |
|---|---|
| | Reporting error |
| | Calculation error |
| | Missing information/data |
| | Wrong information/data |
| | Analytical problem/correction |
| X | Client change/request |
| | Subcontracted laboratory error |
| | Other (define) |

**Edata Required:**

| | |
|---|---|
| X | Yes |
| | No |

# Analytical Report for

# 221 Sunset Drive - Residential VI Sampling 2016

## ASL Report #: Q3277
## Project ID: 681225.GW.01

**Attn: Kimberly Stokes**

Authorized and Released By:

Kathy McKinley

Laboratory Project Manager
Kathy McKinley
*(541) 758-0235 ext.23144*
*December 29, 2016*

All analyses performed by CH2M HILL are clearly indicated. Any subcontracted analyses are included as appended reports as received from the subcontracted laboratory. The results included in this report only relate to the samples listed on the following Sample Cross-Reference page. This report shall not be reproduced except in full, without the written approval of the laboratory.

Any unusual difficulties encountered during the analysis of your samples are discussed in the attached case narratives.

Accredited in accordance with NELAP:
Oregon (100022)
Louisiana (05031)

CH2M – Applied Sciences Laboratory
1100 NE Circle Boulevard, Suite 300
Corvallis, Oregon 97330 Email: asl@ch2m.com
www.ch2m.com

**ASL Report #: Q3277**

## Sample Receipt Comments

We certify that the test results meet all NELAP requirements.

## Sample Cross-Reference

| ASL Sample ID | Client Sample ID | Date/Time Collected | Date Received |
|---|---|---|---|
| Q327701 | MW202-SV-10-15-101616 | 10/16/16 09:05 | 10/18/16 |
| Q327702 | SV19-SV-101616 | 10/16/16 09:30 | 10/18/16 |
| Q327703 | MW201-SV-10-20-101616 | 10/16/16 10:13 | 10/18/16 |
| Q327704 | MW200-SV-5-10-101616 | 10/16/16 10:42 | 10/18/16 |
| Q327705 | SV16-SV-101616 | 10/16/16 12:00 | 10/18/16 |
| Q327706 | SV17-SV-101616 | 10/16/16 14:40 | 10/18/16 |
| Q327707 | MW117S-SV-5-15-101616 | 10/16/16 15:47 | 10/18/16 |
| Q327708 | MW118S-SV-5-15-101616 | 10/16/16 18:35 | 10/18/16 |
| Q327709 | MW119D-SV-28-38-101716 | 10/17/16 12:50 | 10/18/16 |
| Q327710 | MW119D-SV-28-38-101716-FD | 10/17/16 12:50 | 10/18/16 |
| Q327711 | MW119S-SV-10-20-101716 | 10/17/16 13:25 | 10/18/16 |
| Q327712 | MW119S-SV-10-20-101716-FD | 10/17/16 13:25 | 10/18/16 |

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## Data Qualifiers

| | |
|---|---|
| U | The analyte was not detected and is reported as less than the quantitation (or detection) limit. |
| J | The analyte was positively identified and is reported as an estimated value below the quantitation limit. |
| E | The analyte was positively identified and the reported result exceeded the instrument calibration range. |
| B | Blank contamination—the reported result is associated with a contaminated blank. |
| M | A matrix effect was present. |
| R | The data must be evaluated for usability due to deficiencies in the ability to analyze the sample and meet QC criteria. |
| UJ | The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain QC criteria. |
| P | The primary and confirmation analyte result recoveries do not match (dual column analysis). |

CH2MHILL
Applied Sciences Laboratory (ASL)

# Applied Sciences Group QC Codes for Raw Data Mark Up

| Code | Description |
|---|---|
| R01 | Illegible entry |
| R02 | Unnecessary entry |
| R03 | Typo |
| R04 | Misspelled |
| R05 | Page mis-numbered |
| R06 | Transcription error or incorrect entry |
| R07 | Rounding error |
| R08 | Unused code |
| R09 | Unused code |
| R10 | Wrong date entered |
| R11 | Wrong sample number |
| R12 | Wrong dilution factor |
| R13 | Wrong concentration |
| R14 | Wrong batch number |
| R15 | Wrong standard concentration |
| R16 | Wrong standard lot # |
| R17 | Remake of standards |
| R18 | Unused code |
| R19 | Unused code |
| R20 | Re-calibration of equipment |
| R21 | Sample rerun |
| R22 | Miscalculation |
| R23 | Wrong detection limit given |
| R24 | Less than reporting limit |
| R25 | Non-target compound |
| R26 | Less than detection limit |
| R27 | Unused code |
| R28 | Includes dilution factor |
| R29 | Sample relogged-in under a different work order |
| R30 | Equipment malfunction |
| R31 | Unused code |
| R32 | Unused code |
| R33 | Manual integration of qualifying ion only |
| R34 | Software split peak |
| R35 | Software included interfering peak |
| R37 | Peak area enhanced by software |
| R38 | Peak area excluded by software |
| R39 | Peak misidentification by software |
| R40 | Delete baseline noise |
| R41 | Unused code |
| R42 | Unused code |
| R43 | Unused code |
| R44 | Reanalysis due to the failure of an ISTD |
| R45 | Analysis didn't acquire |

# ANALYSIS METHOD

# TO15

*1100 NE Circle Blvd., Suite 300*
*Corvallis, OR 97330*
*Tel 541-768-3120 Fax 541-752-0276*

# CASE NARRATIVE
# GC/MS VOLATILES ANALYSIS

**Lab Name:** CH2M ASL **ASL SDG#:** Q3277

**Project:** 221 Sunset Drive **Project #:** 681225.GW.01

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

**Method(s):**
TO15

# SAMPLE DATA SUMMARY

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW202-SV-10-15-101616**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327701

Lab File ID: Q327701.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/18/16

Dilution Factor: 4.34

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 1.69 | 5.64 | 5.64 | U |
| 75-35-4 | 1,1-Dichloroethene | 2.63 | 8.75 | 8.75 | U |
| 75-09-2 | Methylene chloride | 2.30 | 76.7 | 76.7 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 2.63 | 8.75 | 8.75 | U |
| 75-34-3 | 1,1-Dichloroethane | 2.68 | 8.93 | 8.93 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 2.63 | 8.75 | 8.75 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 3.61 | 12.0 | 12.0 | U |
| 79-01-6 | Trichloroethene (TCE) | 3.56 | 11.9 | 326 | |
| 127-18-4 | Tetrachloroethene (PCE) | 4.49 | 15.0 | 15.0 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW202-SV-10-15-101616D**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327701D

Lab File ID: Q327701D.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/18/16

Dilution Factor: 4.34

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 1.69 | 5.64 | 5.64 | U |
| 75-35-4 | 1,1-Dichloroethene | 2.63 | 8.75 | 8.75 | U |
| 75-09-2 | Methylene chloride | 2.30 | 76.7 | 76.7 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 2.63 | 8.75 | 8.75 | U |
| 75-34-3 | 1,1-Dichloroethane | 2.68 | 8.93 | 8.93 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 2.63 | 8.75 | 8.75 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 3.61 | 12.0 | 12.0 | U |
| 79-01-6 | Trichloroethene (TCE) | 3.56 | 11.9 | 315 | |
| 127-18-4 | Tetrachloroethene (PCE) | 4.49 | 15.0 | 15.0 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**SV19-SV-101616**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327702

Lab File ID: Q327702.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/18/16

Dilution Factor: 2

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 0.780 | 2.60 | 2.60 | U |
| 75-35-4 | 1,1-Dichloroethene | 1.21 | 4.00 | 4.00 | U |
| 75-09-2 | Methylene chloride | 1.06 | 35.3 | 35.3 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 1.21 | 4.00 | 4.00 | U |
| 75-34-3 | 1,1-Dichloroethane | 1.24 | 4.10 | 4.10 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 1.21 | 4.00 | 4.00 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 1.67 | 5.50 | 5.50 | U |
| 79-01-6 | Trichloroethene (TCE) | 1.64 | 5.50 | 350 | |
| 127-18-4 | Tetrachloroethene (PCE) | 2.07 | 6.90 | 6.90 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW201-SV-10-20-101616**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327703

Lab File ID: Q327703.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/18/16

Dilution Factor: 200

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 78.0 | 260 | 260 | U |
| 75-35-4 | 1,1-Dichloroethene | 121 | 403 | 403 | U |
| 75-09-2 | Methylene chloride | 106 | 3530 | 3530 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 121 | 403 | 403 | U |
| 75-34-3 | 1,1-Dichloroethane | 124 | 412 | 412 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 121 | 403 | 403 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 167 | 555 | 555 | U |
| 79-01-6 | Trichloroethene (TCE) | 164 | 546 | 787 | |
| 127-18-4 | Tetrachloroethene (PCE) | 207 | 690 | 690 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW200-SV-5-10-101616**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327704

Lab File ID: Q327704.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/18/16

Dilution Factor: 3.94

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 1.54 | 5.12 | 5.12 | U |
| 75-35-4 | 1,1-Dichloroethene | 2.38 | 7.95 | 7.95 | U |
| 75-09-2 | Methylene chloride | 2.09 | 69.6 | 69.6 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 2.38 | 7.94 | 7.94 | U |
| 75-34-3 | 1,1-Dichloroethane | 2.43 | 8.11 | 8.11 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 2.38 | 7.94 | 7.94 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 3.28 | 10.9 | 10.9 | U |
| 79-01-6 | Trichloroethene (TCE) | 3.23 | 10.8 | 150 | |
| 127-18-4 | Tetrachloroethene (PCE) | 4.08 | 13.6 | 13.6 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**SV16-SV-101616**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327705

Lab File ID: Q327705.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/18/16

Dilution Factor: 7.03

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 2.73 | 9.15 | 9.15 | U |
| 75-35-4 | 1,1-Dichloroethene | 4.24 | 14.2 | 14.2 | U |
| 75-09-2 | Methylene chloride | 3.71 | 124 | 124 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 4.23 | 14.2 | 14.2 | U |
| 75-34-3 | 1,1-Dichloroethane | 4.32 | 14.5 | 14.5 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 4.23 | 14.2 | 14.2 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 5.83 | 19.5 | 19.5 | U |
| 79-01-6 | Trichloroethene (TCE) | 5.74 | 19.2 | 1770 | |
| 127-18-4 | Tetrachloroethene (PCE) | 7.24 | 24.3 | 24.3 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**SV17-SV-101616**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327706

Lab File ID: Q327706.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/18/16

Dilution Factor: 7.43

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 2.89 | 9.67 | 9.67 | U |
| 75-35-4 | 1,1-Dichloroethene | 4.48 | 15.0 | 15.0 | U |
| 75-09-2 | Methylene chloride | 3.92 | 131 | 131 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 4.48 | 15.0 | 15.0 | U |
| 75-34-3 | 1,1-Dichloroethane | 4.57 | 15.3 | 15.3 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 4.48 | 15.0 | 15.0 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 6.16 | 20.6 | 20.6 | U |
| 79-01-6 | Trichloroethene (TCE) | 6.06 | 20.3 | 1800 | |
| 127-18-4 | Tetrachloroethene (PCE) | 7.66 | 25.7 | 25.7 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW117S-SV-5-15-101616**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327707

Lab File ID: Q327707.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/18/16

Dilution Factor: 7.2

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 2.81 | 9.36 | 9.36 | U |
| 75-35-4 | 1,1-Dichloroethene | 4.36 | 14.5 | 14.5 | U |
| 75-09-2 | Methylene chloride | 3.82 | 127 | 127 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 4.36 | 14.5 | 14.5 | U |
| 75-34-3 | 1,1-Dichloroethane | 4.45 | 14.8 | 14.8 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 4.36 | 14.5 | 14.5 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 5.99 | 20.0 | 20.0 | U |
| 79-01-6 | Trichloroethene (TCE) | 5.90 | 19.7 | 2180 | |
| 127-18-4 | Tetrachloroethene (PCE) | 7.45 | 24.8 | 24.8 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW118S-SV-5-15-101616**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327708

Lab File ID: Q327708.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/19/16

Dilution Factor: 4170.83

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 1630 | 5430 | 5430 | U |
| 75-35-4 | 1,1-Dichloroethene | 2520 | 8430 | 8430 | U |
| 75-09-2 | Methylene chloride | 2210 | 73900 | 73900 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 2520 | 8430 | 8430 | U |
| 75-34-3 | 1,1-Dichloroethane | 2580 | 8600 | 8600 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 2520 | 8430 | 231000 | |
| 71-55-6 | 1,1,1-Trichloroethane | 3470 | 11600 | 11600 | U |
| 79-01-6 | Trichloroethene (TCE) | 3420 | 11400 | 1270000 | |
| 127-18-4 | Tetrachloroethene (PCE) | 4320 | 14400 | 14400 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW119D-SV-28-38-101716**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327709

Lab File ID: Q327709.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/19/16

Dilution Factor: 50

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 19.5 | 65.0 | 65.0 | U |
| 75-35-4 | 1,1-Dichloroethene | 30.2 | 101 | 101 | U |
| 75-09-2 | Methylene chloride | 26.5 | 883 | 883 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 30.2 | 101 | 101 | U |
| 75-34-3 | 1,1-Dichloroethane | 30.9 | 103 | 103 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 30.2 | 101 | 101 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 41.6 | 139 | 139 | U |
| 79-01-6 | Trichloroethene (TCE) | 41.0 | 137 | 16600 | |
| 127-18-4 | Tetrachloroethene (PCE) | 51.7 | 173 | 173 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW119D-SV-28-38-101716-FD**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327710

Lab File ID: Q327710.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/19/16

Dilution Factor: 50

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm) Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 19.5 | 65.0 | 65.0 | U |
| 75-35-4 | 1,1-Dichloroethene | 30.2 | 101 | 101 | U |
| 75-09-2 | Methylene chloride | 26.5 | 883 | 883 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 30.2 | 101 | 101 | U |
| 75-34-3 | 1,1-Dichloroethane | 30.9 | 103 | 103 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 30.2 | 101 | 101 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 41.6 | 139 | 139 | U |
| 79-01-6 | Trichloroethene (TCE) | 41.0 | 137 | 16800 | |
| 127-18-4 | Tetrachloroethene (PCE) | 51.7 | 173 | 173 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW119S-SV-10-20-101716**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327711

Lab File ID: Q327711.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/19/16

Dilution Factor: 7.9

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 3.09 | 10.3 | 10.3 | U |
| 75-35-4 | 1,1-Dichloroethene | 4.80 | 15.9 | 15.9 | U |
| 75-09-2 | Methylene chloride | 4.21 | 140 | 140 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 4.80 | 15.9 | 15.9 | U |
| 75-34-3 | 1,1-Dichloroethane | 4.90 | 16.3 | 16.3 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 4.80 | 15.9 | 15.9 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 6.60 | 21.9 | 21.9 | U |
| 79-01-6 | Trichloroethene (TCE) | 6.50 | 21.6 | 2550 | |
| 127-18-4 | Tetrachloroethene (PCE) | 8.21 | 27.2 | 27.2 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**MW119S-SV-10-20-101716-FD**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: Q327712

Lab File ID: Q327712.D

Level: (LOW/MED) LOW

Date Received: 10/18/16

Date Analyzed: 10/19/16

Dilution Factor: 7.87

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 3.07 | 10.2 | 10.2 | U |
| 75-35-4 | 1,1-Dichloroethene | 4.76 | 15.9 | 15.9 | U |
| 75-09-2 | Methylene chloride | 4.17 | 139 | 139 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 4.76 | 15.9 | 15.9 | U |
| 75-34-3 | 1,1-Dichloroethane | 4.86 | 16.2 | 16.2 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 4.76 | 15.9 | 15.9 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 6.55 | 21.9 | 21.9 | U |
| 79-01-6 | Trichloroethene (TCE) | 6.45 | 21.5 | 2530 | |
| 127-18-4 | Tetrachloroethene (PCE) | 8.14 | 27.2 | 27.2 | U |

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Field Sample ID:

**XB1-1018**

SDG No.: Q3277

Analysis Method: TO15

Matrix: AIR

Lab Name: CH2M ASL

Lab Sample ID: XB1-1018

Lab File ID: XB1-1018.D

Level: (LOW/MED) LOW

Date Received: / /

Date Analyzed: 10/18/16

Dilution Factor: 1

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

Concentration Units: UG/M3

| CAS No. | Analyte | DL | PQL | Result | Q |
|---|---|---|---|---|---|
| 75-01-4 | Vinyl Chloride | 0.390 | 1.30 | 1.30 | U |
| 75-35-4 | 1,1-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-09-2 | Methylene chloride | 0.530 | 17.7 | 17.7 | U |
| 156-60-5 | trans-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 75-34-3 | 1,1-Dichloroethane | 0.618 | 2.06 | 2.06 | U |
| 156-59-2 | cis-1,2-Dichloroethene | 0.605 | 2.02 | 2.02 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 0.833 | 2.77 | 2.77 | U |
| 79-01-6 | Trichloroethene (TCE) | 0.819 | 2.73 | 2.73 | U |
| 127-18-4 | Tetrachloroethene (PCE) | 1.03 | 3.45 | 3.45 | U |

# QC SUMMARY

# AIR VOLATILE SURROGATE RECOVERY

SDG No.: Q3277 Lab Name: CH2M ASL

Analysis Method: TO15

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| | Field/QC Sample ID | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | # Out |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BS1X-1018 | 102 | 100 | | | | | | | | | | | |
| 2 | XB1-1018 | 98 | 83 | | | | | | | | | | | |
| 3 | MW202-SV-10-15-101616 | 99 | 91 | | | | | | | | | | | |
| 4 | MW202-SV-10-15-101616D | 99 | 93 | | | | | | | | | | | |
| 5 | SV19-SV-101616 | 99 | 90 | | | | | | | | | | | |
| 6 | MW201-SV-10-20-101616 | 102 | 93 | | | | | | | | | | | |
| 7 | MW200-SV-5-10-101616 | 101 | 94 | | | | | | | | | | | |
| 8 | SV16-SV-101616 | 101 | 92 | | | | | | | | | | | |
| 9 | SV17-SV-101616 | 100 | 94 | | | | | | | | | | | |
| 10 | MW117S-SV-5-15-101616 | 101 | 91 | | | | | | | | | | | |
| 11 | MW118S-SV-5-15-101616 | 101 | 91 | | | | | | | | | | | |
| 12 | MW119D-SV-28-38-101716 | 104 | 94 | | | | | | | | | | | |
| 13 | MW119D-SV-28-38-101716-FD | 104 | 90 | | | | | | | | | | | |
| 14 | MW119S-SV-10-20-101716 | 103 | 94 | | | | | | | | | | | |
| 15 | MW119S-SV-10-20-101716-FD | 102 | 95 | | | | | | | | | | | |
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* Values outside of QC limits

D Surrogate diluted out

| | | QC Limits |
|---|---|---|
| S1: | Toluene-d8 | (70-130) |
| S2: | 4-Bromofluorobenzene | (70-130) |

# AIR VOLATILE DUPLICATE SAMPLE SUMMARY

SDG No.: Q3277

Lab Name: CH2M ASL

Analysis Method: TO15

Concentration Units: UG/M3

Native Sample ID: MW202-SV-10-15-101616

Duplicate Sample ID: MW202-SV-10-15-101616D

| Analyte | Native Result | Duplicate Result | %RPD | QC Limits %RPD | Q |
|---|---|---|---|---|---|
| Vinyl Chloride | 5.64U | 5.64U | | 20 | NC |
| 1,1-Dichloroethene | 8.75U | 8.75U | | 20 | NC |
| Methylene chloride | 76.7U | 76.7U | | 20 | NC |
| trans-1,2-Dichloroethene | 8.75U | 8.75U | | 20 | NC |
| 1,1-Dichloroethane | 8.93U | 8.93U | | 20 | NC |
| cis-1,2-Dichloroethene | 8.75U | 8.75U | | 20 | NC |
| 1,1,1-Trichloroethane | 12.0U | 12.0U | | 20 | NC |
| Trichloroethene (TCE) | 326 | 315 | 3.43 | 20 | |
| Tetrachloroethene (PCE) | 15.0U | 15.0U | | 20 | NC |

* Values outside of QC limits
NC RPD Value Not Calculated

Comments:

# AIR VOLATILE BLANK SPIKE RECOVERY

SDG No.: Q3277 Lab Name: CH2M ASL

Analysis Method: TO15 Blank Spike ID: BS1X-1018

GC Column: ZB-624 ID: 0.25 (mm) Instrument Name: MSAA

| Analyte | Spike Added (UG/M3) | BS Result (UG/M3) | %R | QC Limits %R | Q |
|---|---|---|---|---|---|
| Vinyl Chloride | 78.0 | 77.2 | 99 | 70-130 | |
| 1,1-Dichloroethene | 121 | 111 | 92 | 70-130 | |
| Methylene chloride | 106 | 104 | 98 | 70-130 | |
| 1,1-Dichloroethane | 124 | 124 | 100 | 70-130 | |
| cis-1,2-Dichloroethene | 121 | 121 | 100 | 70-130 | |
| 1,1,1-Trichloroethane | 167 | 162 | 97 | 70-130 | |
| Trichloroethene (TCE) | 164 | 145 | 88 | 70-130 | |
| Tetrachloroethene (PCE) | 207 | 211 | 102 | 70-130 | |
| trans-1,2-Dichloroethene | 121 | 121 | 100 | 70-130 | |

* Values outside of QC limits

Comments:

4A

AIR VOLATILE METHOD BLANK SUMMARY

Field Sample ID:

XB1-1018

SDG No.: Q3277

Lab Name: CH2M ASL

Analysis Method: TO15

Lab Sample ID: XB1-1018

Lab File ID: XB1-1018.D

Date Analyzed: 10/18/16

GC Column: ZB-624 ID: 0.25 (mm)

Time Analyzed: 1741

Instrument Name: MSAA

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | BS1X-1018 | BS1X-1018 | BS1X-1018.D | 10/18/16 | 1658 |
| 2 | MW202-SV-10-15-101616 | Q327701 | Q327701.D | 10/18/16 | 1824 |
| 3 | MW202-SV-10-15-101616D | Q327701D | Q327701D.D | 10/18/16 | 1907 |
| 4 | SV19-SV-101616 | Q327702 | Q327702.D | 10/18/16 | 1950 |
| 5 | MW201-SV-10-20-101616 | Q327703 | Q327703.D | 10/18/16 | 2034 |
| 6 | MW200-SV-5-10-101616 | Q327704 | Q327704.D | 10/18/16 | 2118 |
| 7 | SV16-SV-101616 | Q327705 | Q327705.D | 10/18/16 | 2201 |
| 8 | SV17-SV-101616 | Q327706 | Q327706.D | 10/18/16 | 2245 |
| 9 | MW117S-SV-5-15-101616 | Q327707 | Q327707.D | 10/18/16 | 2328 |
| 10 | MW118S-SV-5-15-101616 | Q327708 | Q327708.D | 10/19/16 | 0012 |
| 11 | MW119D-SV-28-38-101716 | Q327709 | Q327709.D | 10/19/16 | 0055 |
| 12 | MW119D-SV-28-38-101716-FD | Q327710 | Q327710.D | 10/19/16 | 0139 |
| 13 | MW119S-SV-10-20-101716 | Q327711 | Q327711.D | 10/19/16 | 0223 |
| 14 | MW119S-SV-10-20-101716-FD | Q327712 | Q327712.D | 10/19/16 | 0306 |

Comments:

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3277 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 10/18/16

Lab File ID: T1-1018.D BFB Injection Time: 0911

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | Q |
|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 3280 (16.8) | |
| 75 | 30% to 60% of mass 95 | 8584 (44.0) | |
| 95 | base peak, 100% relative abundance | 19504 (100.0) | |
| 96 | 5% to 9% of mass 95 | 1240 (6.4) | |
| 173 | 0% to less than 2% of mass 174 | 102 (0.6) | |
| 174 | greater than 50% of mass 95 | 17384 (89.1) | |
| 175 | 5% to 9% of mass 174 | 1302 (7.5) | |
| 176 | >95%, but <101% of mass 174 | 17472 (100.5) | |
| 177 | 5% to 9% of mass 176 | 1173 (6.7) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | Level_1 | Level_1 | Level_1.D | 10/18/16 | 0911 |
| 2 | Level_2 | Level_2 | Level_2.D | 10/18/16 | 0954 |
| 3 | Level_3 | Level_3 | Level_3.D | 10/18/16 | 1036 |
| 4 | Level_4 | Level_4 | Level_4.D | 10/18/16 | 1119 |
| 5 | Level_5 | Level_5 | Level_5.D | 10/18/16 | 1202 |
| 6 | Level_6 | Level_6 | Level_6.D | 10/18/16 | 1244 |
| 7 | Level_7 | Level_7 | Level_7.D | 10/18/16 | 1327 |
| 8 | ICV-1018 | ICV-1018 | ICV-1018.D | 10/18/16 | 1452 |

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

SDG No.: Q3277 Lab Name: CH2M ASL

Analysis Method: TO15 BFB Injection Date: 10/18/16

Lab File ID: T1-1018.D BFB Injection Time: 1612

Instrument: MSAA

GC Column: ZB-624 ID: 0.25 (mm)

| Mass | Ion Abundance Criteria | % Relative | Q |
|---|---|---|---|
| 50 | 15% to 40% of mass 95 | 5290 (17.5) | |
| 75 | 30% to 60% of mass 95 | 13455 (44.5) | |
| 95 | base peak, 100% relative abundance | 30208 (100.0) | |
| 96 | 5% to 9% of mass 95 | 2016 (6.7) | |
| 173 | 0% to less than 2% of mass 174 | 214 (0.8) | |
| 174 | greater than 50% of mass 95 | 27368 (90.6) | |
| 175 | 5% to 9% of mass 174 | 1975 (7.2) | |
| 176 | >95%, but <101% of mass 174 | 27216 (99.4) | |
| 177 | 5% to 9% of mass 176 | 1760 (6.5) | |

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | Field Sample ID | Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed |
|---|---|---|---|---|---|
| 1 | CV1-1018 | CV1-1018 | CV1-1018.D | 10/18/16 | 1612 |
| 2 | BS1X-1018 | BS1X-1018 | BS1X-1018.D | 10/18/16 | 1658 |
| 3 | XB1-1018 | XB1-1018 | XB1-1018.D | 10/18/16 | 1741 |
| 4 | MW202-SV-10-15-101616 | Q327701 | Q327701.D | 10/18/16 | 1824 |
| 5 | MW202-SV-10-15-101616D | Q327701D | Q327701D.D | 10/18/16 | 1907 |
| 6 | SV19-SV-101616 | Q327702 | Q327702.D | 10/18/16 | 1950 |
| 7 | MW201-SV-10-20-101616 | Q327703 | Q327703.D | 10/18/16 | 2034 |
| 8 | MW200-SV-5-10-101616 | Q327704 | Q327704.D | 10/18/16 | 2118 |
| 9 | SV16-SV-101616 | Q327705 | Q327705.D | 10/18/16 | 2201 |
| 10 | SV17-SV-101616 | Q327706 | Q327706.D | 10/18/16 | 2245 |
| 11 | MW117S-SV-5-15-101616 | Q327707 | Q327707.D | 10/18/16 | 2328 |
| 12 | MW118S-SV-5-15-101616 | Q327708 | Q327708.D | 10/19/16 | 0012 |
| 13 | MW119D-SV-28-38-101716 | Q327709 | Q327709.D | 10/19/16 | 0055 |
| 14 | MW119D-SV-28-38-101716-FD | Q327710 | Q327710.D | 10/19/16 | 0139 |
| 15 | MW119S-SV-10-20-101716 | Q327711 | Q327711.D | 10/19/16 | 0223 |
| 16 | MW119S-SV-10-20-101716-FD | Q327712 | Q327712.D | 10/19/16 | 0306 |
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6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3277

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 10/18/16 10/18/16

Instrument Name: MSAA

Calibration Times: 0911 1327

Heat Purge: (Y/N) N

Concentration Units: ppbv

| ICAL Sample IDs: | Level_1 | Level_2 | Level_3 | Level_4 | Level_5 | Level_6 |
|---|---|---|---|---|---|---|
| ICAL File IDs: | Level_1.D | Level_2.D | Level_3.D | Level_4.D | Level_5.D | Level_6.D |

| Analyte | Std 1 | RF 1 | Std 2 | RF 2 | Std 3 | RF 3 | Std 4 | RF 4 | Std 5 | RF 5 | Std 6 | RF 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Vinyl Chloride | .5 | 2.005 | 1 | 1.833 | 5 | 1.535 | 20 | 0.864 | 30 | 0.834 | 50 | 0.761 |
| 1,1-Dichloroethene | .5 | 3.625 | 1 | 3.301 | 5 | 2.798 | 20 | 1.563 | 30 | 1.449 | 50 | 1.300 |
| Methylene chloride | .5 | 2.143 | 1 | 1.766 | 5 | 1.520 | 20 | 0.896 | 30 | 0.832 | 50 | 0.778 |
| trans-1,2-Dichloroethene | .5 | 2.439 | 1 | 2.108 | 5 | 1.970 | 20 | 1.184 | 30 | 1.140 | 50 | 1.080 |
| 1,1-Dichloroethane | .5 | 3.107 | 1 | 2.793 | 5 | 2.509 | 20 | 1.470 | 30 | 1.420 | 50 | 1.318 |
| cis-1,2-Dichloroethene | .5 | 2.284 | 1 | 2.035 | 5 | 1.860 | 20 | 1.076 | 30 | 1.062 | 50 | 0.981 |
| 1,1,1-Trichloroethane | .5 | 2.119 | 1 | 1.966 | 5 | 2.032 | 20 | 1.333 | 30 | 1.353 | 50 | 1.321 |
| 1,4-difluorobenzene | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| Trichloroethene (TCE) | .5 | 1.150 | 1 | 1.044 | 5 | 0.944 | 20 | 0.568 | 30 | 0.537 | 50 | 0.506 |
| Toluene-d8 | 10 | 0.617 | 10 | 0.617 | 10 | 0.622 | 10 | 0.618 | 10 | 0.634 | 10 | 0.627 |
| Tetrachloroethene (PCE) | .5 | 0.846 | 1 | 0.752 | 5 | 0.686 | 20 | 0.412 | 30 | 0.402 | 50 | 0.383 |
| Chlorobenzene-d5 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 | 10 | 1.000 |
| 4-Bromofluorobenzene | 10 | 0.346 | 10 | 0.345 | 10 | 0.347 | 10 | 0.356 | 10 | 0.354 | 10 | 0.354 |

@ SPCC # CCC

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3277

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 10/18/16 10/18/16

Instrument Name: MSAA

Calibration Times: 0911 1327

Heat Purge: (Y/N) N

Concentration Units: ppbv

ICAL Sample IDs: Level_7

ICAL File IDs: Level_7.D

| Analyte | Std 7 | RF 7 | Std 8 | RF 8 | Std 9 | RF 9 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromochloromethane | 10 | 1.000 | | | | | | | | | | |
| Vinyl Chloride | 100 | 0.722 | | | | | | | | | | |
| 1,1-Dichloroethene | 100 | 1.146 | | | | | | | | | | |
| Methylene chloride | 100 | 0.731 | | | | | | | | | | |
| trans-1,2-Dichloroethene | 100 | 1.013 | | | | | | | | | | |
| 1,1-Dichloroethane | 100 | 1.241 | | | | | | | | | | |
| cis-1,2-Dichloroethene | 100 | 0.903 | | | | | | | | | | |
| 1,1,1-Trichloroethane | 100 | 1.292 | | | | | | | | | | |
| 1,4-difluorobenzene | 10 | 1.000 | | | | | | | | | | |
| Trichloroethene (TCE) | 100 | 0.433 | | | | | | | | | | |
| Toluene-d8 | 10 | 0.640 | | | | | | | | | | |
| Tetrachloroethene (PCE) | 100 | 0.347 | | | | | | | | | | |
| Chlorobenzene-d5 | 10 | 1.000 | | | | | | | | | | |
| 4-Bromofluorobenzene | 10 | 0.359 | | | | | | | | | | |

@ SPCC # CCC

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

SDG No.: Q3277

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date(s): 10/18/16 10/18/16

Instrument Name: MSAA

Calibration Times: 0911 1327

Heat Purge: (Y/N)N

Concentration Units: ppbv

| Analyte | Curve Type | Avg. RF | %RSD | r | COD | Q |
|---|---|---|---|---|---|---|
| Bromochloromethane | AVG | 1.000 | 0.00 | | | |
| Vinyl Chloride | LINR | 1.222 | | 0.998 | | |
| 1,1-Dichloroethene | QUAD | 2.169 | | | 0.998 | |
| Methylene chloride | LINR | 1.238 | | 0.998 | | |
| trans-1,2-Dichloroethene | LINR | 1.562 | | 0.998 | | |
| 1,1-Dichloroethane | LINR | 1.980 | | 0.998 | | |
| cis-1,2-Dichloroethene | LINR | 1.457 | | 0.998 | | |
| 1,1,1-Trichloroethane | LINR | 1.631 | | 0.999 | | |
| 1,4-difluorobenzene | AVG | 1.000 | 0.00 | | | |
| Trichloroethene (TCE) | QUAD | 0.740 | | | 0.995 | |
| Toluene-d8 | AVG | 0.625 | 1.47 | | | |
| Tetrachloroethene (PCE) | LINR | 0.547 | | 0.998 | | |
| Chlorobenzene-d5 | AVG | 1.000 | 0.00 | | | |
| 4-Bromofluorobenzene | AVG | 0.351 | 1.57 | | | |

@ SPCC # CCC

# VOLATILE INITIAL CALIBRATION CHECK

SDG No.: Q3277

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 10/18/16 1452

Instrument ID: MSAA

Init. Calib. Date(s): 10/18/16 10/18/16

2nd Source ICV-1018

Init. Calib. Time(s): 0911 1327

Lab File ID: ICV-1018.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 35.4 | 0.915 | 0.000 | 18 | 30 | |
| 1,1-Dichloroethene | 30.0 | 34.1 | 1.600 | 0.000 | 14 | 30 | |
| Methylene chloride | 30.0 | 36.8 | 0.961 | 0.000 | 23 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 34.1 | 1.229 | 0.000 | 14 | 30 | |
| 1,1-Dichloroethane | 30.0 | 35.1 | 1.556 | 0.000 | 17 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 37.8 | 1.223 | 0.000 | 26 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 34.7 | 1.533 | 0.000 | 16 | 30 | |
| Trichloroethene (TCE) | 30.0 | 29.0 | 0.545 | 0.000 | -3 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 34.2 | 0.428 | 0.000 | 14 | 30 | |

* SPCC # CCC

# VOLATILE CONTINUING CALIBRATION CHECK

SDG No.: Q3277

Lab Name: CH2M ASL

Analysis Method: TO15

Calibration Date/Time: 10/18/16 1612

Instrument ID: MSAA

Init. Calib. Date(s): 10/18/16 10/18/16

Cal Check ID: CV1-1018

Init. Calib. Time(s): 0911 1327

Lab File ID: CV1-1018.D

GC Column: ZB-624 ID: 0.25 (mm)

Heat Purge:(Y/N) N

Concentration Units: ppbv

| Analyte | Expected | Found | RRF | Min. RRF | %D | Max. %D | Q |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | 30.0 | 30.2 | 0.793 | 0.000 | 0.7 | 30 | |
| 1,1-Dichloroethene | 30.0 | 28.1 | 1.356 | 0.000 | -6 | 30 | |
| Methylene chloride | 30.0 | 30.0 | 0.799 | 0.000 | -0.1 | 30 | |
| trans-1,2-Dichloroethene | 30.0 | 30.3 | 1.105 | 0.000 | 1 | 30 | |
| 1,1-Dichloroethane | 30.0 | 30.3 | 1.362 | 0.000 | 1 | 30 | |
| cis-1,2-Dichloroethene | 30.0 | 30.7 | 1.013 | 0.000 | 2 | 30 | |
| 1,1,1-Trichloroethane | 30.0 | 29.9 | 1.330 | 0.000 | -0.4 | 30 | |
| Trichloroethene (TCE) | 30.0 | 25.5 | 0.486 | 0.000 | -15 | 30 | |
| Toluene-d8 | 10.0 | 10.2 | 0.638 | 0.000 | 2 | 30 | |
| Tetrachloroethene (PCE) | 30.0 | 31.4 | 0.397 | 0.000 | 5 | 30 | |
| 4-Bromofluorobenzene | 10.0 | 9.88 | 0.347 | 0.000 | -1 | 30 | |

* SPCC # CCC

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3277

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: CV1-1018 | Date Analyzed: 10/18/16

Lab File ID: CV1-1018.D | Time Analyzed: 1612

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 153403 | 14.6 | 482179 | 16.28 | 234811 | 20.56 |
| | Upper Limit | 214764 | 15.1 | 675051 | 16.78 | 328735 | 21.06 |
| | Lower Limit | 92042 | 14.1 | 289307 | 15.78 | 140887 | 20.06 |
| Field Sample ID | Lab Sample ID | | | | | | |
| BS1X-1018 | BS1X-1018 | 151928 | 14.60 | 479955 | 16.28 | 237856 | 20.56 |
| XB1-1018 | XB1-1018 | 133642 | 14.59 | 425991 | 16.27 | 186721 | 20.56 |
| MW202-SV-10-15-10161 | Q327701 | 145643 | 14.60 | 458086 | 16.27 | 209091 | 20.56 |
| MW202-SV-10-15-10161 | Q327701D | 146223 | 14.60 | 464008 | 16.28 | 213914 | 20.56 |
| SV19-SV-101616 | Q327702 | 136529 | 14.59 | 436256 | 16.27 | 195947 | 20.56 |
| MW201-SV-10-20-10161 | Q327703 | 137278 | 14.60 | 434109 | 16.27 | 200379 | 20.56 |
| MW200-SV-5-10-101616 | Q327704 | 143851 | 14.60 | 465336 | 16.28 | 215935 | 20.56 |
| SV16-SV-101616 | Q327705 | 135203 | 14.60 | 441335 | 16.28 | 203823 | 20.56 |
| SV17-SV-101616 | Q327706 | 130616 | 14.59 | 429290 | 16.27 | 196572 | 20.56 |
| MW117S-SV-5-15-10161 | Q327707 | 131320 | 14.60 | 438346 | 16.28 | 199604 | 20.56 |
| MW118S-SV-5-15-10161 | Q327708 | 131652 | 14.60 | 426041 | 16.27 | 196079 | 20.56 |
| MW119D-SV-28-38-1017 | Q327709 | 131780 | 14.60 | 428340 | 16.28 | 206030 | 20.56 |
| MW119D-SV-28-38-1017 | Q327710 | 132738 | 14.60 | 422340 | 16.28 | 201270 | 20.56 |
| MW119S-SV-10-20-1017 | Q327711 | 140807 | 14.61 | 454302 | 16.28 | 213156 | 20.56 |
| MW119S-SV-10-20-1017 | Q327712 | 141467 | 14.60 | 458108 | 16.28 | 213489 | 20.56 |
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IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

SDG No.: Q3277

Analysis Method: TO15 | Lab Name: CH2M ASL

Lab Sample ID: Level_5 | Date Analyzed: 10/18/16

Lab File ID: Level_5.D | Time Analyzed: 1202

Instrument Name: MSAA | Heat Purge: (Y/N) N

GC Column: ZB-624 ID: 0.25 (mm)

| | | IS1 | | IS2 | | IS3 | |
|---|---|---|---|---|---|---|---|
| | | AREA # | RT # | AREA # | RT # | AREA # | RT # |
| | Reference Cal | 145618 | 14.61 | 467627 | 16.29 | 228296 | 20.56 |
| | Upper Limit | 203865 | 15.11 | 654678 | 16.79 | 319614 | 21.06 |
| | Lower Limit | 87371 | 14.11 | 280576 | 15.79 | 136978 | 20.06 |
| Field Sample ID | Lab Sample ID | | | | | | |
| ICV-1018 | ICV-1018 | 148336 | 14.61 | 460787 | 16.29 | 222481 | 20.56 |

IS1: Bromochloromethane

IS2: 1,4-Difluorobenzene

IS3: Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of Internal Standard Area
AREA LOWER LIMIT = - 40% of Internal Standard Area
RT UPPER LIMIT = + 0.50 of Internal Standard RT
RT LOWER LIMIT = - 0.50 of Internal Standard RT

# Column used to flag values outside of QC limits with an asterisk

# CHAIN OF CUSTODY/SHIPPING DOCUMENTS

Q 3277

ch2m

12750 Merit Drive Suite 1100
Dallas, TX
Tel No: (352) 384-7002
Fax No: (352) 214-2814

# CHAIN-OF-CUSTODY RECORD

COC NUMBER: 681225-1

| PROJECT NAME | PROJECT NUMBER | LAB NAME AND CONTACT | FAX AND MAIL REPORTS ADD TO RECIPIENT 1 (Name and Company) | RECIPIENT 1 Address, Tel No. and Fax No. |
|---|---|---|---|---|
| 221 Sunset Drive | 681225.GW.01 | Applied Sciences Lab<br>Kathy McKinley, Lab PM | Amy Klopper/CH2M<br>amy.klopper@ch2m.com | |
| PROJECT PHASE/MD/TASK | CTO OR DO NUMBER | LAB PO NUMBER | FAX AND MAIL REPORTS ADD TO RECIPIENT 2 (Name and Company) | RECIPIENT 2 Address, Tel No. and Fax No. |
| Residential VI Sampling 2016 | | NA | Barrie Selcoe/CH2M<br>barrie.selcoe@ch2m.com | Monica Schneider/CH2M<br>monica.schneider@ch2m.com |
| PROJECT CONTACT | PROJECT TEL NO AND FAX NO | LAB TEL NO AND FAX NO | FAX AND MAIL REPORTS ADD TO RECIPIENT 3 (Name and Company) | RECIPIENT 3 Address, Tel No. and Fax No. |
| Kimberly Stokes | Phone: 214-998-4839 | Phone: 541-768-3144 | Kimberly Stokes/CH2M kimberly.stokes@ch2m.com | email |

| 17 ITEM | 19 SAMPLE ID | 20 MATRIX (see codes on SOP) | 21 DATE AND TIME START | 21 DATE AND TIME STOP | 23 CANISTER VACUUM IN FIELD, HG (START) | 23 CANISTER VACUUM IN FIELD, HG (STOP) | FLOW CONTROLLER ID | CANISTER ID | 23 DATA PKG LEVEL (see codes on SOP) | 24 TAT (calendar days) | TO-15 Scan | TO-15 SIM | 26 SAMPLE TYPE (see codes on SOP) | 27 LAB ID (for lab's use) | 28 COMMENTS/ SCREENING READINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MW202-SV-10-15-101616 | SV | 10/16/16 9:00 | 10/16/16 9:05 | 28.85 | 6.53 | FC3218V | SG1814 | | 24 Hour | X | | | | 24 Hour TAT |
| 2 | MD-SV20-101616 | SV | 10/16/16 9:25 | 10/16/16 9:30 | 28.61 | 4.51 | FC3229V | SG1337 | | 24 Hour | X | | | | 24 Hour TAT |
| 3 | MW201-SV-10-20-101616 | SV | 10/16/16 10:08 | 10/16/16 10:13 | 28.80 | 6.79 | FC3223V | SG1769 | | 24 Hour | X | | | | 24 Hour TAT |
| 4 | MW200-SV-5-10-101616 | SV | 10/16/16 10:37 | 10/16/16 10:42 | 28.53 | 3.91 | FC3926B | SG1787 | | 24 Hour | X | | | | 24 Hour TAT |
| 5 | MD-SV16-101616 | SV | 10/16/16 11:55 | 10/16/16 12:00 | 28.69 | 5.43 | FC39378 | SG1701 | | 24 Hour | X | | | | 24 Hour TAT |
| 6 | MD-SV17-101616 | SV | 10/16/16 14:35 | 10/16/16 14:40 | 28.80 | 5.89 | FC3981B | SG1366 | | 24 Hour | X | | | | 24 Hour TAT |
| 7 | MW117S-SV-5-15-101616 | SV | 10/16/16 15:42 | 10/16/16 15:47 | 28.78 | 5.81 | FC3950B | SG2009 | | 24 Hour | X | | | | 24 Hour TAT |
| 8 | ~~MW119D-SV-30-40-101616~~ | ~~SV~~ | ~~10/16/16 17:07~~ | ~~10/16/16 17:12~~ | ~~28.80~~ | ~~5.84~~ | ~~FC3957B~~ | ~~SG1268~~ | | ~~24 Hour~~ | ~~X~~ | | | | ~~24 Hour TAT~~ |
| 9 | ~~MD119S-SV-10-20-101616~~ | ~~SV~~ | ~~10/16/16 17:40~~ | ~~10/16/16 17:45~~ | ~~28.73~~ | ~~5.62~~ | ~~FC3975B~~ | ~~SG1729~~ | | ~~24 Hour~~ | ~~X~~ | | | | ~~24 Hour TAT~~ |
| 10 | MW118S-SV-5-15-101616 | SV | 10/16/16 18:30 | 10/16/16 18:35 | 28.76 | 6.57 | FC3961B | SG1853 | | 24 Hour | X | | | | 24 Hour TAT |
| 11 | MW119D-SV-30-40-101616 SV | | 10/17/16 1045 | 10/17/16 1050 | -28.71 | -6.20 | FC3943B | SG1763 | | 24 hr | X | | | | ~~24 hr TAT~~ |
| 12 | MW119D-SV-30-40-101616-FD | | 10/17/16 1045 | 10/17/16 1050 | -28.52 | -7.70 | FC3962B | SG1785 | | 24 hr | X | | | | ~~24 hr TAT~~ |
| 13 | MW119S-SV-10-20-101616 | | 10/17/16 1320 | 10/17/16 1325 | -28.58 | -7.53 | C0003 | SG1696 | | 24 hr | X | | | | ~~24 hr TAT~~ |
| 14 | MW119S-SV-10-20-101616-FD | | 10/17/16 1320 | 10/17/16 1325 | -28.75 | -2.64 | C0042 | SG2008 | | 24 hrs | X | | | | ~~24 hr TAT~~ |
| 15 | | | | | | | | | | | | | | | |
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Do not analyze (20)

1 2 3 4 5 6 7 8 9 10 11 12

ROG PC

SAMPLE(S) AND COMPANY (if applicable): 

* EQUIX number & Special Instructions: Select VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, methylene chloride, PCE, TCE, and vinyl chloride)

SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab use): 23.6°C

| RELINQUISHED BY (Printed Name and Signature) | DATE | TIME | RECEIVED BY (Printed Name and Signature) | DATE | TIME |
|---|---|---|---|---|---|
| Zach Dolhan | 10/17/16 | 1000 | Pierrette Castro Pierrette Castro | 10/18/16 | 1040 |

Distribution: [x] Original - Laboratory (To be returned with Analytical Report) [ ] Copy 1 - Project File [ ] Copy 2 - PMO

Form CC001, Rev 08/00

# CH2M Applied Sciences Laboratory

## Sample Receipt Record

SDG ID: Q3277 Date Received: 10/16/2016

Client/Project: 221 Sunset Received by: PC

| | | | |
|---|---|---|---|
| Were custody seals intact and on the outside of the cooler? | ☑ Yes | ☐ No | ☐ N/A |
| Shipping Record: | ☐ Hand Delivered | ☑ On File | ☐ COC |
| Radiological Screening for DoD | ☐ Yes | ☐ No | ☑ N/A |
| Packing Material: | ☐ Hand Delivered | ☐ Ice ☐ Blue Ice | ☑ Box |
| Temp OK? (<6C) Therm ID: TH173 Exp. 1/17 | 22.6 °C ☐ Yes | ☐ No | ☑ N/A |
| Was a Chain of Custody (CoC) Provided? | ☑ Yes | ☐ No | ☐ N/A |
| Was the CoC correctly filled out (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did sample labels agree with COC? (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Did the CoC list a correct bottle count and the preservative types (No=Correct on CoC) | ☑ Yes | ☐ No | ☐ N/A |
| Were the sample containers in good condition (not broken or leaking)? | ☑ Yes | ☐ No | ☐ N/A |
| Was enough sample volume provided for analysis? (If No, document below) | ☑ Yes | ☐ No | ☐ N/A |
| Containers supplied by ASL? | ☑ Yes | ☐ No | ☐ N/A |
| Any sample with < 1/2 holding time remaining? If so contact LPM and document below. | ☐ Yes | ☑ No | ☐ N/A |
| Samples have multi-phase? If yes, document on SRER | ☐ Yes | ☑ No | ☐ N/A |
| All water VOCs free of air bubbles? No, document on SRER | ☐ Yes | ☐ No | ☑ N/A |
| pH of all samples met criteria on receipt? If "No", preserve and document below. | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals filtered in the field? | ☐ Yes | ☐ No | ☑ N/A |
| Dissolved/Soluble metals have sediment in bottom of container? If so document below. | ☐ Yes | ☐ No | ☑ N/A |

### Preservation Adjustment

| Sample ID | Reagent | Reagent Lot Number | Volume Added | Initials/Date-Time | 24 hour pH check Initials/Time |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

Did pH of all metals samples preserved upon receipt meet criteria 24 hours after preservation? ☐ Yes ☐ No

### Sample Exception Report (The following exceptions were noted)

Client was notified on: Client contact:

Resolution to Exception: