2655 Park Center Dr., Suite A
Simi Valley, CA 93065
**T:** +1 805 526 7161
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www.alsglobal.com

# LABORATORY REPORT

May 2, 2016

Rob Nieman
ALS Environmental
4388 Glendale Milford Road
Cincinnati, OH 45242

**RE: Keystone Landfill/PADOH/PADEP / 1604617**

Dear Rob:

Enclosed are the results of the sample submitted to our laboratory on April 19, 2016. For your reference, these analyses have been assigned our service request number P1602045.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**ALS | Environmental**

Kate Aguilera

*By Kate Aguilera at 4:01 pm, May 02, 2016*

Kate Aguilera
Project Manager

2655 Park Center Dr., Suite A
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www.alsglobal.com

Client: ALS Environmental
Project: Keystone Landfill/PADOH/PADEP / 1604617

Service Request No: P1602045

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## CASE NARRATIVE

The sample was received intact under chain of custody on April 19, 2016 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

Sulfur Analysis

The sample was analyzed for twenty sulfur compounds per ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are quantitated against the initial calibration curve for methyl mercaptan. This method is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP or AIHA-LAP accreditation.

Volatile Organic Compound Analysis

The sample was also analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation, however it is not part of the AIHA-LAP accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The spike recovery of 1,4-Dioxane in the Laboratory Control Sample (LCS) was outside the laboratory generated control criteria. The recovery error equates to a potential high bias. However, the recovery in question was within the method criteria, therefore the data quality has not been significantly affected. No corrective action was taken.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

| Agency | Web Site | Number |
|---|---|---|
| AIHA | http://www.aihaaccreditedlabs.org | 101661 |
| Arizona DHS | http://www.azdhs.gov/lab/license/env.htm | AZ0694 |
| DoD ELAP | http://www.pjlabs.com/search-accredited-labs | L15-398 |
| Florida DOH (NELAP) | http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm | E871020 |
| Maine DHHS | http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm | 2014025 |
| Minnesota DOH (NELAP) | http://www.health.state.mn.us/accreditation | 977273 |
| New Jersey DEP (NELAP) | http://www.nj.gov/dep/oqa/ | CA009 |
| New York DOH (NELAP) | http://www.wadsworth.org/labcert/elap/elap.html | 11221 |
| Oregon PHD (NELAP) | http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx | 4068-003 |
| Pennsylvania DEP | http://www.depweb.state.pa.us/labs | 68-03307 (Registration) |
| Texas CEQ (NELAP) | http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html | T104704413-15-6 |
| Utah DOH (NELAP) | http://www.health.utah.gov/lab/labimp/certification/index.html | CA016272015-5 |
| Washington DOE | http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html | C946 |

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

## ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Environmental
Service Request: P1602045
Project ID: Keystone Landfill/PADOH/PADEP / 1604617

Date Received: 4/19/2016
Time Received: 09:35

| Client Sample ID | Lab Code | Matrix | Date Collected | Time Collected | Container ID | Pi1 (psig) | Pf1 (psig) | ASTM D 5504-12 - Sulfur Can | TO-15 - VOC Cans |
|---|---|---|---|---|---|---|---|---|---|
| 1604617-06A (SHP041616-Summa) | P1602045-001 | Air | 4/16/2016 | 09:45 | AS00756 | -4.65 | 3.23 | X | X |

Subcontractor:
ALS Simi Valley
2655 Park Center Drive
Suite A
Simi Valley,
TEL: (805) 526-7161
FAX: (805) 526-7270
Acct #:

Salesperson

# CHAIN-OF-CUSTODY RECORD



Date: **20-Apr-16**
COC ID: **3987**
Due Date **03-May-16**

P1602045

| Customer Information | | Project Information | | Parameter/Method Request for Analysis | |
|---|---|---|---|---|---|
| Purchase Order | 31-2077 | Project Name | 1604617 | A | Sulfur gases by ASTM 5504 Mod. (A5504) |
| Work Order | | Project Number | | B | TO-15 by GC/MS (ETO-15) |
| Company Name | ALS Group USA, Corp | Bill To Company | ALS Group USA, Corp | C | |
| Send Report To | Rob Nieman | Inv Attn | Accounts Payable | D | |
| Address | 4388 Glendale Milford Rd | Address | 4388 Glendale Milford Rd | E | |
| | | | | F | |
| City/State/Zip | Cincinnati, Ohio 45242- | City/State/Zip | Cincinnati, Ohio 45242- | G | |
| Phone | (513) 733-5336 | Phone | (513) 733-5336 | H | |
| Fax | (513) 733-5347 | Fax | (513) 733-5347 | I | |
| eMail Address | alscn.reporting@alsglobal.com | eMail CC | | J | |

| Sample ID | Matrix | Collection Date 24hr | Bottle | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1604617-06A (SHP041616-Summa) | Air | 16/Apr/2016 9:35 | (1) SUMMA | X | X | | | | | | | | |



**Comments:**

| Relinquished by: | Date/Time | Received by: | Date/Time | Cooler IDs | Report/QC Level |
|---|---|---|---|---|---|
| | | | | | **Std** |
| Relinquished by: | Date/Time | Received by: | Date/Time | | |
| | | Al David | 04/19/16 @ 09:35 | | |

# SUMMA

## Air - Chain of Custody Record & Analytical Service Request

Page _____ of _____

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No. P160 2045

ALS Contact:

Company Name & Address (Reporting Information)
Pennsylvania Dept. of Environmental Protection
2 Public Square
Wilkes-Barre, PA 18701-1915

Project Name: Keystone Landfill/PADOH/PADEP

Project Number:

P.O. # / Billing Information:

Project Manager: Roger Bellas

Phone: (570) 826-2511

Fax: (570) 826-5448

Sampler (Print & Sign):

Email Address for Result Reporting: RBELLAS@PA.GOV

| Client Sample ID | Laboratory ID Number | Date Collected | Time Collected | Canister ID (Bar code # - AC, SC, etc.) | Flow Controller ID (Bar code # - FC #) | Canister Start Pressure "Hg | Canister End Pressure "Hg/psig | Sample Volume | Analysis Method | Legal Seal# |
|---|---|---|---|---|---|---|---|---|---|---|
| Sherwood PL. | ① | 04/16/16 | 0945 | 16800 | FCR00168 | -.29 | -.9 | | | 107149 |
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6 of 20

Report Tier Levels - please select

Tier I - Results (Default if not specified) _____
Tier II (Results + QC Summaries _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Data Validation Package) 10% Surcharge _____

EDD required YES / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by: (Signature) | Date: 4/18/16 | Time: 0830 | Received by: (Signature) | Date: | Time: |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Date: 4/19/16 | Time: 0935 |

Cooler / Blank Temperature _____ °C

# ALS Environmental
## Sample Acceptance Check Form

Client: ALS Environmental  Work order: P1602045

Project: Keystone Landfill/PADOH/PADEP / 1604617

Sample(s) received on: 4/19/16  Date opened: 4/19/16  by: ADAVID

***Note:*** This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

| | | Yes | No | N/A |
|---|---|---|---|---|
| 1 | Were **sample containers** properly marked with client sample ID? | ☒ | ☐ | ☐ |
| 2 | Did **sample containers** arrive in good condition? | ☒ | ☐ | ☐ |
| 3 | Were **chain-of-custody** papers used and filled out? | ☒ | ☐ | ☐ |
| 4 | Did **sample container labels** and/or tags agree with custody papers? | ☒ | ☐ | ☐ |
| 5 | Was **sample volume** received adequate for analysis? | ☒ | ☐ | ☐ |
| 6 | Are samples within specified holding times? | ☒ | ☐ | ☐ |
| 7 | Was proper **temperature** (thermal preservation) of cooler at receipt adhered to? | ☐ | ☐ | ☒ |
| 8 | Were **custody seals** on outside of cooler/Box/Container? | ☒ | ☐ | ☐ |
| | Location of seal(s)? Box sealing. Sealing Lid? | ☒ | ☐ | ☐ |
| | Were signature and date included? | ☐ | ☒ | ☐ |
| | Were seals intact? | ☒ | ☐ | ☐ |
| 9 | Do containers have appropriate **preservation**, according to method/SOP or Client specified information? | ☐ | ☐ | ☒ |
| | Is there a client indication that the submitted samples are **pH** preserved? | ☐ | ☐ | ☒ |
| | Were **VOA vials** checked for presence/absence of air bubbles? | ☐ | ☐ | ☒ |
| | Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it? | ☐ | ☐ | ☒ |
| 10 | **Tubes:** Are the tubes capped and intact? | ☐ | ☐ | ☒ |
| 11 | **Badges:** Are the badges properly capped and intact? | ☐ | ☐ | ☒ |
| | Are dual bed badges separated and individually capped and intact? | ☐ | ☐ | ☒ |

| Lab Sample ID | Container Description | Required pH * | Received pH | Adjusted pH | VOA Headspace (Presence/Absence) | Receipt / Preservation Comments |
|---|---|---|---|---|---|---|
| P1602045-001.01 | 6.0 L Silonite Can | | | | | |
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Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

# ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **ALS Environmental**
**Client Sample ID:** **1604617-06A (SHP041616-Summa)** ALS Project ID: P1602045
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P1602045-001

Test Code: ASTM D 5504-12 Date Collected: 4/16/16
Instrument ID: Agilent 6890A/GC13/SCD Time Collected: 09:45
Analyst: Mike Conejo Date Received: 4/19/16
Sample Type: 6.0 L Silonite Canister Date Analyzed: 4/20/16
Test Notes: Time Analyzed: 15:52
Container ID: AS00756 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -4.65 Final Pressure (psig): 3.23

Canister Dilution Factor: 1.78

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 7783-06-4 | Hydrogen Sulfide | ND | 12 | ND | 8.9 | |
| 463-58-1 | Carbonyl Sulfide | ND | 22 | ND | 8.9 | |
| 74-93-1 | Methyl Mercaptan | ND | 18 | ND | 8.9 | |
| 75-08-1 | Ethyl Mercaptan | ND | 23 | ND | 8.9 | |
| 75-18-3 | Dimethyl Sulfide | ND | 23 | ND | 8.9 | |
| 75-15-0 | Carbon Disulfide | ND | 14 | ND | 4.5 | |
| 75-33-2 | Isopropyl Mercaptan | ND | 28 | ND | 8.9 | |
| 75-66-1 | tert-Butyl Mercaptan | ND | 33 | ND | 8.9 | |
| 107-03-9 | n-Propyl Mercaptan | ND | 28 | ND | 8.9 | |
| 624-89-5 | Ethyl Methyl Sulfide | ND | 28 | ND | 8.9 | |
| 110-02-1 | Thiophene | ND | 31 | ND | 8.9 | |
| 513-44-0 | Isobutyl Mercaptan | ND | 33 | ND | 8.9 | |
| 352-93-2 | Diethyl Sulfide | ND | 33 | ND | 8.9 | |
| 109-79-5 | n-Butyl Mercaptan | ND | 33 | ND | 8.9 | |
| 624-92-0 | Dimethyl Disulfide | ND | 17 | ND | 4.5 | |
| 616-44-4 | 3-Methylthiophene | ND | 36 | ND | 8.9 | |
| 110-01-0 | Tetrahydrothiophene | ND | 32 | ND | 8.9 | |
| 638-02-8 | 2,5-Dimethylthiophene | ND | 41 | ND | 8.9 | |
| 872-55-9 | 2-Ethylthiophene | ND | 41 | ND | 8.9 | |
| 110-81-6 | Diethyl Disulfide | ND | 22 | ND | 4.5 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **ALS Environmental**
**Client Sample ID:** **Method Blank** ALS Project ID: P1602045
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P160420-MB

Test Code: ASTM D 5504-12 Date Collected: NA
Instrument ID: Agilent 6890A/GC13/SCD Time Collected: NA
Analyst: Mike Conejo Date Received: NA
Sample Type: 6.0 L Silonite Canister Date Analyzed: 4/20/16
Test Notes: Time Analyzed: 08:13
Volume(s) Analyzed: 1.0 ml(s)

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 7783-06-4 | Hydrogen Sulfide | ND | 7.0 | ND | 5.0 | |
| 463-58-1 | Carbonyl Sulfide | ND | 12 | ND | 5.0 | |
| 74-93-1 | Methyl Mercaptan | ND | 9.8 | ND | 5.0 | |
| 75-08-1 | Ethyl Mercaptan | ND | 13 | ND | 5.0 | |
| 75-18-3 | Dimethyl Sulfide | ND | 13 | ND | 5.0 | |
| 75-15-0 | Carbon Disulfide | ND | 7.8 | ND | 2.5 | |
| 75-33-2 | Isopropyl Mercaptan | ND | 16 | ND | 5.0 | |
| 75-66-1 | tert-Butyl Mercaptan | ND | 18 | ND | 5.0 | |
| 107-03-9 | n-Propyl Mercaptan | ND | 16 | ND | 5.0 | |
| 624-89-5 | Ethyl Methyl Sulfide | ND | 16 | ND | 5.0 | |
| 110-02-1 | Thiophene | ND | 17 | ND | 5.0 | |
| 513-44-0 | Isobutyl Mercaptan | ND | 18 | ND | 5.0 | |
| 352-93-2 | Diethyl Sulfide | ND | 18 | ND | 5.0 | |
| 109-79-5 | n-Butyl Mercaptan | ND | 18 | ND | 5.0 | |
| 624-92-0 | Dimethyl Disulfide | ND | 9.6 | ND | 2.5 | |
| 616-44-4 | 3-Methylthiophene | ND | 20 | ND | 5.0 | |
| 110-01-0 | Tetrahydrothiophene | ND | 18 | ND | 5.0 | |
| 638-02-8 | 2,5-Dimethylthiophene | ND | 23 | ND | 5.0 | |
| 872-55-9 | 2-Ethylthiophene | ND | 23 | ND | 5.0 | |
| 110-81-6 | Diethyl Disulfide | ND | 12 | ND | 2.5 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY



**Client:** **ALS Environmental**
**Client Sample ID:** **Lab Control Sample** ALS Project ID: P1602045
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P160420-LCS

Test Code: ASTM D 5504-12 Date Collected: NA
Instrument ID: Agilent 6890A/GC13/SCD Date Received: NA
Analyst: Mike Conejo Date Analyzed: 4/20/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: NA ml(s)
Test Notes:

| CAS # | Compound | Spike Amount ppbV | Result ppbV | % Recovery | ALS Acceptance Limits | Data Qualifier |
|---|---|---|---|---|---|---|
| 7783-06-4 | Hydrogen Sulfide | 1,000 | **1,190** | **119** | 65-138 | |
| 463-58-1 | Carbonyl Sulfide | 1,000 | **1,270** | **127** | 60-135 | |
| 74-93-1 | Methyl Mercaptan | 1,000 | **1,180** | **118** | 57-140 | |

## ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **ALS Environmental**
**Client Sample ID:** **1604617-06A (SHP041616-Summa)** ALS Project ID: P1602045
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P1602045-001

Test Code: EPA TO-15 Date Collected: 4/16/16
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 4/19/16
Analyst: Simon Cao Date Analyzed: 4/22/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00756

Initial Pressure (psig): -4.65 Final Pressure (psig): 3.23

Canister Dilution Factor: 1.78

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 115-07-1 | Propene | ND | 0.89 | ND | 0.52 | |
| 75-71-8 | Dichlorodifluoromethane (CFC 12) | **2.1** | 0.89 | **0.42** | 0.18 | |
| 74-87-3 | Chloromethane | ND | 0.89 | ND | 0.43 | |
| 76-14-2 | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | ND | 0.89 | ND | 0.13 | |
| 75-01-4 | Vinyl Chloride | ND | 0.89 | ND | 0.35 | |
| 106-99-0 | 1,3-Butadiene | ND | 0.89 | ND | 0.40 | |
| 74-83-9 | Bromomethane | ND | 0.89 | ND | 0.23 | |
| 75-00-3 | Chloroethane | ND | 0.89 | ND | 0.34 | |
| 64-17-5 | Ethanol | ND | 8.9 | ND | 4.7 | |
| 75-05-8 | Acetonitrile | ND | 0.89 | ND | 0.53 | |
| 107-02-8 | Acrolein | ND | 3.6 | ND | 1.6 | |
| 67-64-1 | Acetone | ND | 8.9 | ND | 3.7 | |
| 75-69-4 | Trichlorofluoromethane | **1.2** | 0.89 | **0.21** | 0.16 | |
| 67-63-0 | 2-Propanol (Isopropyl Alcohol) | ND | 8.9 | ND | 3.6 | |
| 107-13-1 | Acrylonitrile | ND | 0.89 | ND | 0.41 | |
| 75-35-4 | 1,1-Dichloroethene | ND | 0.89 | ND | 0.22 | |
| 75-09-2 | Methylene Chloride | ND | 0.89 | ND | 0.26 | |
| 107-05-1 | 3-Chloro-1-propene (Allyl Chloride) | ND | 0.89 | ND | 0.28 | |
| 76-13-1 | Trichlorotrifluoroethane | ND | 0.89 | ND | 0.12 | |
| 75-15-0 | Carbon Disulfide | ND | 8.9 | ND | 2.9 | |
| 156-60-5 | trans-1,2-Dichloroethene | ND | 0.89 | ND | 0.22 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 0.89 | ND | 0.22 | |
| 1634-04-4 | Methyl tert-Butyl Ether | ND | 0.89 | ND | 0.25 | |
| 108-05-4 | Vinyl Acetate | ND | 8.9 | ND | 2.5 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 8.9 | ND | 3.0 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

## ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **ALS Environmental**
**Client Sample ID:** **1604617-06A (SHP041616-Summa)** ALS Project ID: P1602045
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P1602045-001

Test Code: EPA TO-15 Date Collected: 4/16/16
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 4/19/16
Analyst: Simon Cao Date Analyzed: 4/22/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00756

Initial Pressure (psig): -4.65 Final Pressure (psig): 3.23

Canister Dilution Factor: 1.78

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | ND | 0.89 | ND | 0.22 | |
| 141-78-6 | Ethyl Acetate | **3.5** | 1.8 | **0.98** | 0.49 | |
| 110-54-3 | n-Hexane | ND | 0.89 | ND | 0.25 | |
| 67-66-3 | Chloroform | ND | 0.89 | ND | 0.18 | |
| 109-99-9 | Tetrahydrofuran (THF) | ND | 0.89 | ND | 0.30 | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.89 | ND | 0.22 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 0.89 | ND | 0.16 | |
| 71-43-2 | Benzene | **1.0** | 0.89 | **0.33** | 0.28 | |
| 56-23-5 | Carbon Tetrachloride | ND | 0.89 | ND | 0.14 | |
| 110-82-7 | Cyclohexane | ND | 1.8 | ND | 0.52 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 0.89 | ND | 0.19 | |
| 75-27-4 | Bromodichloromethane | ND | 0.89 | ND | 0.13 | |
| 79-01-6 | Trichloroethene | ND | 0.89 | ND | 0.17 | |
| 123-91-1 | 1,4-Dioxane | ND | 0.89 | ND | 0.25 | |
| 80-62-6 | Methyl Methacrylate | ND | 1.8 | ND | 0.43 | |
| 142-82-5 | n-Heptane | ND | 0.89 | ND | 0.22 | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 0.89 | ND | 0.20 | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 0.89 | ND | 0.22 | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 0.89 | ND | 0.20 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 0.89 | ND | 0.16 | |
| 108-88-3 | Toluene | **1.2** | 0.89 | **0.32** | 0.24 | |
| 591-78-6 | 2-Hexanone | ND | 0.89 | ND | 0.22 | |
| 124-48-1 | Dibromochloromethane | ND | 0.89 | ND | 0.10 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.89 | ND | 0.12 | |
| 123-86-4 | n-Butyl Acetate | ND | 0.89 | ND | 0.19 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

## ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **ALS Environmental**
**Client Sample ID:** **1604617-06A (SHP041616-Summa)** ALS Project ID: P1602045
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P1602045-001

Test Code: EPA TO-15 Date Collected: 4/16/16
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 4/19/16
Analyst: Simon Cao Date Analyzed: 4/22/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00756

Initial Pressure (psig): -4.65 Final Pressure (psig): 3.23

Canister Dilution Factor: 1.78

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 111-65-9 | n-Octane | ND | 0.89 | ND | 0.19 | |
| 127-18-4 | Tetrachloroethene | ND | 0.89 | ND | 0.13 | |
| 108-90-7 | Chlorobenzene | ND | 0.89 | ND | 0.19 | |
| 100-41-4 | Ethylbenzene | ND | 0.89 | ND | 0.20 | |
| 179601-23-1 | m,p-Xylenes | ND | 1.8 | ND | 0.41 | |
| 75-25-2 | Bromoform | ND | 0.89 | ND | 0.086 | |
| 100-42-5 | Styrene | ND | 0.89 | ND | 0.21 | |
| 95-47-6 | o-Xylene | ND | 0.89 | ND | 0.20 | |
| 111-84-2 | n-Nonane | ND | 0.89 | ND | 0.17 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 0.89 | ND | 0.13 | |
| 98-82-8 | Cumene | ND | 0.89 | ND | 0.18 | |
| 80-56-8 | alpha-Pinene | ND | 0.89 | ND | 0.16 | |
| 103-65-1 | n-Propylbenzene | ND | 0.89 | ND | 0.18 | |
| 622-96-8 | 4-Ethyltoluene | ND | 0.89 | ND | 0.18 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 0.89 | ND | 0.18 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 0.89 | ND | 0.18 | |
| 100-44-7 | Benzyl Chloride | ND | 0.89 | ND | 0.17 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 0.89 | ND | 0.15 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 0.89 | ND | 0.15 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 0.89 | ND | 0.15 | |
| 5989-27-5 | d-Limonene | ND | 0.89 | ND | 0.16 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | ND | 0.89 | ND | 0.092 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 0.89 | ND | 0.12 | |
| 91-20-3 | Naphthalene | ND | 0.89 | ND | 0.17 | |
| 87-68-3 | Hexachlorobutadiene | ND | 0.89 | ND | 0.083 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

## ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **ALS Environmental**
**Client Sample ID:** **Method Blank** ALS Project ID: P1602045
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P160422-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 4/22/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 115-07-1 | Propene | ND | 0.50 | ND | 0.29 | |
| 75-71-8 | Dichlorodifluoromethane (CFC 12) | ND | 0.50 | ND | 0.10 | |
| 74-87-3 | Chloromethane | ND | 0.50 | ND | 0.24 | |
| 76-14-2 | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | ND | 0.50 | ND | 0.072 | |
| 75-01-4 | Vinyl Chloride | ND | 0.50 | ND | 0.20 | |
| 106-99-0 | 1,3-Butadiene | ND | 0.50 | ND | 0.23 | |
| 74-83-9 | Bromomethane | ND | 0.50 | ND | 0.13 | |
| 75-00-3 | Chloroethane | ND | 0.50 | ND | 0.19 | |
| 64-17-5 | Ethanol | ND | 5.0 | ND | 2.7 | |
| 75-05-8 | Acetonitrile | ND | 0.50 | ND | 0.30 | |
| 107-02-8 | Acrolein | ND | 2.0 | ND | 0.87 | |
| 67-64-1 | Acetone | ND | 5.0 | ND | 2.1 | |
| 75-69-4 | Trichlorofluoromethane | ND | 0.50 | ND | 0.089 | |
| 67-63-0 | 2-Propanol (Isopropyl Alcohol) | ND | 5.0 | ND | 2.0 | |
| 107-13-1 | Acrylonitrile | ND | 0.50 | ND | 0.23 | |
| 75-35-4 | 1,1-Dichloroethene | ND | 0.50 | ND | 0.13 | |
| 75-09-2 | Methylene Chloride | ND | 0.50 | ND | 0.14 | |
| 107-05-1 | 3-Chloro-1-propene (Allyl Chloride) | ND | 0.50 | ND | 0.16 | |
| 76-13-1 | Trichlorotrifluoroethane | ND | 0.50 | ND | 0.065 | |
| 75-15-0 | Carbon Disulfide | ND | 5.0 | ND | 1.6 | |
| 156-60-5 | trans-1,2-Dichloroethene | ND | 0.50 | ND | 0.13 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 0.50 | ND | 0.12 | |
| 1634-04-4 | Methyl tert-Butyl Ether | ND | 0.50 | ND | 0.14 | |
| 108-05-4 | Vinyl Acetate | ND | 5.0 | ND | 1.4 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 5.0 | ND | 1.7 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**Client:** **ALS Environmental**

**Client Sample ID:** **Method Blank** ALS Project ID: P1602045

**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P160422-MB

Test Code: EPA TO-15 Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA

Analyst: Simon Cao Date Analyzed: 4/22/16

Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | ND | 0.50 | ND | 0.13 | |
| 141-78-6 | Ethyl Acetate | ND | 1.0 | ND | 0.28 | |
| 110-54-3 | n-Hexane | ND | 0.50 | ND | 0.14 | |
| 67-66-3 | Chloroform | ND | 0.50 | ND | 0.10 | |
| 109-99-9 | Tetrahydrofuran (THF) | ND | 0.50 | ND | 0.17 | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.50 | ND | 0.12 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 0.50 | ND | 0.092 | |
| 71-43-2 | Benzene | ND | 0.50 | ND | 0.16 | |
| 56-23-5 | Carbon Tetrachloride | ND | 0.50 | ND | 0.080 | |
| 110-82-7 | Cyclohexane | ND | 1.0 | ND | 0.29 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 0.50 | ND | 0.11 | |
| 75-27-4 | Bromodichloromethane | ND | 0.50 | ND | 0.075 | |
| 79-01-6 | Trichloroethene | ND | 0.50 | ND | 0.093 | |
| 123-91-1 | 1,4-Dioxane | ND | 0.50 | ND | 0.14 | |
| 80-62-6 | Methyl Methacrylate | ND | 1.0 | ND | 0.24 | |
| 142-82-5 | n-Heptane | ND | 0.50 | ND | 0.12 | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 0.50 | ND | 0.11 | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 0.50 | ND | 0.12 | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 0.50 | ND | 0.11 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 0.50 | ND | 0.092 | |
| 108-88-3 | Toluene | ND | 0.50 | ND | 0.13 | |
| 591-78-6 | 2-Hexanone | ND | 0.50 | ND | 0.12 | |
| 124-48-1 | Dibromochloromethane | ND | 0.50 | ND | 0.059 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.50 | ND | 0.065 | |
| 123-86-4 | n-Butyl Acetate | ND | 0.50 | ND | 0.11 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

**Client:** **ALS Environmental**

**Client Sample ID:** **Method Blank** ALS Project ID: P1602045

**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P160422-MB

Test Code: EPA TO-15 Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA

Analyst: Simon Cao Date Analyzed: 4/22/16

Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 111-65-9 | n-Octane | ND | 0.50 | ND | 0.11 | |
| 127-18-4 | Tetrachloroethene | ND | 0.50 | ND | 0.074 | |
| 108-90-7 | Chlorobenzene | ND | 0.50 | ND | 0.11 | |
| 100-41-4 | Ethylbenzene | ND | 0.50 | ND | 0.12 | |
| 179601-23-1 | m,p-Xylenes | ND | 1.0 | ND | 0.23 | |
| 75-25-2 | Bromoform | ND | 0.50 | ND | 0.048 | |
| 100-42-5 | Styrene | ND | 0.50 | ND | 0.12 | |
| 95-47-6 | o-Xylene | ND | 0.50 | ND | 0.12 | |
| 111-84-2 | n-Nonane | ND | 0.50 | ND | 0.095 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 0.50 | ND | 0.073 | |
| 98-82-8 | Cumene | ND | 0.50 | ND | 0.10 | |
| 80-56-8 | alpha-Pinene | ND | 0.50 | ND | 0.090 | |
| 103-65-1 | n-Propylbenzene | ND | 0.50 | ND | 0.10 | |
| 622-96-8 | 4-Ethyltoluene | ND | 0.50 | ND | 0.10 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 0.50 | ND | 0.10 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 0.50 | ND | 0.10 | |
| 100-44-7 | Benzyl Chloride | ND | 0.50 | ND | 0.097 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 0.50 | ND | 0.083 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 0.50 | ND | 0.083 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 0.50 | ND | 0.083 | |
| 5989-27-5 | d-Limonene | ND | 0.50 | ND | 0.090 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | ND | 0.50 | ND | 0.052 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 0.50 | ND | 0.067 | |
| 91-20-3 | Naphthalene | ND | 0.50 | ND | 0.095 | |
| 87-68-3 | Hexachlorobutadiene | ND | 0.50 | ND | 0.047 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

## ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS



**Client:** **ALS Environmental**
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Project ID: P1602045

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date(s) Collected: 4/16/16
Analyst: Simon Cao Date(s) Received: 4/19/16
Sample Type: 6.0 L Silonite Canister(s) Date(s) Analyzed: 4/22/16
Test Notes:

| Client Sample ID | ALS Sample ID | 1,2-Dichloroethane-d4 Percent Recovered | Toluene-d8 Percent Recovered | Bromofluorobenzene Percent Recovered | Acceptance Limits | Data Qualifier |
|---|---|---|---|---|---|---|
| Method Blank | P160422-MB | **98** | **98** | **103** | 70-130 | |
| Lab Control Sample | P160422-LCS | **97** | **98** | **104** | 70-130 | |
| 1604617-06A (SHP041616-Summa) | P1602045-001 | **102** | **100** | **102** | 70-130 | |

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

## ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY



**Client:** **ALS Environmental**
**Client Sample ID:** **Lab Control Sample** ALS Project ID: P1602045
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P160422-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 4/22/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

| CAS # | Compound | Spike Amount µg/m³ | Result µg/m³ | % Recovery | ALS Acceptance Limits | Data Qualifier |
|---|---|---|---|---|---|---|
| 115-07-1 | Propene | 196 | **205** | **105** | 49-131 | |
| 75-71-8 | Dichlorodifluoromethane (CFC 12) | 188 | **190** | **101** | 65-117 | |
| 74-87-3 | Chloromethane | 200 | **204** | **102** | 48-132 | |
| 76-14-2 | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | 204 | **203** | **100** | 65-122 | |
| 75-01-4 | Vinyl Chloride | 200 | **210** | **105** | 65-128 | |
| 106-99-0 | 1,3-Butadiene | 206 | **259** | **126** | 62-143 | |
| 74-83-9 | Bromomethane | 202 | **217** | **107** | 65-130 | |
| 75-00-3 | Chloroethane | 200 | **199** | **100** | 69-126 | |
| 64-17-5 | Ethanol | 998 | **1250** | **125** | 57-126 | |
| 75-05-8 | Acetonitrile | 212 | **219** | **103** | 51-134 | |
| 107-02-8 | Acrolein | 214 | **238** | **111** | 55-146 | |
| 67-64-1 | Acetone | 1,080 | **1060** | **98** | 57-120 | |
| 75-69-4 | Trichlorofluoromethane | 216 | **194** | **90** | 59-139 | |
| 67-63-0 | 2-Propanol (Isopropyl Alcohol) | 418 | **450** | **108** | 59-129 | |
| 107-13-1 | Acrylonitrile | 212 | **227** | **107** | 64-136 | |
| 75-35-4 | 1,1-Dichloroethene | 216 | **229** | **106** | 72-123 | |
| 75-09-2 | Methylene Chloride | 222 | **196** | **88** | 63-117 | |
| 107-05-1 | 3-Chloro-1-propene (Allyl Chloride) | 218 | **226** | **104** | 50-141 | |
| 76-13-1 | Trichlorotrifluoroethane | 220 | **221** | **100** | 68-118 | |
| 75-15-0 | Carbon Disulfide | 210 | **207** | **99** | 55-143 | |
| 156-60-5 | trans-1,2-Dichloroethene | 210 | **232** | **110** | 69-129 | |
| 75-34-3 | 1,1-Dichloroethane | 212 | **213** | **100** | 66-122 | |
| 1634-04-4 | Methyl tert-Butyl Ether | 216 | **220** | **102** | 55-128 | |
| 108-05-4 | Vinyl Acetate | 1,040 | **1210** | **116** | 66-140 | |
| 78-93-3 | 2-Butanone (MEK) | 220 | **241** | **110** | 62-127 | |

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

**Client:** **ALS Environmental**
**Client Sample ID:** **Lab Control Sample** ALS Project ID: P1602045
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P160422-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 4/22/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

| CAS # | Compound | Spike Amount µg/m³ | **Result µg/m³** | **% Recovery** | ALS Acceptance Limits | **Data Qualifier** |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | 218 | **229** | **105** | 65-125 | |
| 141-78-6 | Ethyl Acetate | 428 | **478** | **112** | 64-132 | |
| 110-54-3 | n-Hexane | 212 | **205** | **97** | 58-126 | |
| 67-66-3 | Chloroform | 224 | **222** | **99** | 68-117 | |
| 109-99-9 | Tetrahydrofuran (THF) | 220 | **216** | **98** | 64-123 | |
| 107-06-2 | 1,2-Dichloroethane | 214 | **223** | **104** | 63-124 | |
| 71-55-6 | 1,1,1-Trichloroethane | 210 | **221** | **105** | 68-120 | |
| 71-43-2 | Benzene | 226 | **202** | **89** | 61-110 | |
| 56-23-5 | Carbon Tetrachloride | 230 | **230** | **100** | 65-137 | |
| 110-82-7 | Cyclohexane | 424 | **436** | **103** | 68-122 | |
| 78-87-5 | 1,2-Dichloropropane | 216 | **222** | **103** | 67-122 | |
| 75-27-4 | Bromodichloromethane | 218 | **232** | **106** | 71-124 | |
| 79-01-6 | Trichloroethene | 216 | **222** | **103** | 71-121 | |
| 123-91-1 | 1,4-Dioxane | 210 | **258** | **123** | 67-122 | **L** |
| 80-62-6 | Methyl Methacrylate | 422 | **485** | **115** | 76-130 | |
| 142-82-5 | n-Heptane | 216 | **219** | **101** | 67-125 | |
| 10061-01-5 | cis-1,3-Dichloropropene | 208 | **238** | **114** | 73-131 | |
| 108-10-1 | 4-Methyl-2-pentanone | 220 | **241** | **110** | 66-132 | |
| 10061-02-6 | trans-1,3-Dichloropropene | 210 | **235** | **112** | 76-135 | |
| 79-00-5 | 1,1,2-Trichloroethane | 216 | **233** | **108** | 73-121 | |
| 108-88-3 | Toluene | 218 | **213** | **98** | 67-117 | |
| 591-78-6 | 2-Hexanone | 220 | **249** | **113** | 59-128 | |
| 124-48-1 | Dibromochloromethane | 220 | **239** | **109** | 73-132 | |
| 106-93-4 | 1,2-Dibromoethane | 218 | **242** | **111** | 73-128 | |
| 123-86-4 | n-Butyl Acetate | 226 | **247** | **109** | 61-136 | |

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.
L = Laboratory control sample recovery outside the specified limits, results may be biased high.

## ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY



**Client:** **ALS Environmental**
**Client Sample ID:** **Lab Control Sample** ALS Project ID: P1602045
**Client Project ID:** **Keystone Landfill/PADOH/PADEP / 1604617** ALS Sample ID: P160422-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 4/22/16
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

| CAS # | Compound | Spike Amount µg/m³ | **Result µg/m³** | **% Recovery** | ALS Acceptance Limits | **Data Qualifier** |
|---|---|---|---|---|---|---|
| 111-65-9 | n-Octane | 210 | **208** | **99** | 67-124 | |
| 127-18-4 | Tetrachloroethene | 202 | **212** | **105** | 65-126 | |
| 108-90-7 | Chlorobenzene | 220 | **226** | **103** | 68-120 | |
| 100-41-4 | Ethylbenzene | 218 | **227** | **104** | 69-123 | |
| 179601-23-1 | m,p-Xylenes | 428 | **450** | **105** | 67-125 | |
| 75-25-2 | Bromoform | 228 | **240** | **105** | 68-153 | |
| 100-42-5 | Styrene | 222 | **249** | **112** | 68-132 | |
| 95-47-6 | o-Xylene | 210 | **217** | **103** | 67-124 | |
| 111-84-2 | n-Nonane | 204 | **205** | **100** | 60-130 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 210 | **229** | **109** | 72-128 | |
| 98-82-8 | Cumene | 208 | **215** | **103** | 67-124 | |
| 80-56-8 | alpha-Pinene | 212 | **222** | **105** | 67-129 | |
| 103-65-1 | n-Propylbenzene | 204 | **214** | **105** | 67-125 | |
| 622-96-8 | 4-Ethyltoluene | 214 | **227** | **106** | 66-128 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | 214 | **226** | **106** | 65-125 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | 218 | **239** | **110** | 62-134 | |
| 100-44-7 | Benzyl Chloride | 220 | **253** | **115** | 74-145 | |
| 541-73-1 | 1,3-Dichlorobenzene | 228 | **263** | **115** | 63-133 | |
| 106-46-7 | 1,4-Dichlorobenzene | 208 | **255** | **123** | 62-129 | |
| 95-50-1 | 1,2-Dichlorobenzene | 220 | **255** | **116** | 62-134 | |
| 5989-27-5 | d-Limonene | 210 | **233** | **111** | 66-137 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 218 | **233** | **107** | 71-147 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 230 | **251** | **109** | 60-145 | |
| 91-20-3 | Naphthalene | 218 | **251** | **115** | 56-158 | |
| 87-68-3 | Hexachlorobutadiene | 230 | **263** | **114** | 56-139 | |

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.