DATA VALIDATION REPORT
2012 REMEDIAL INVESTIGATION/FEASIBILITY STUDY

OPERABLE UNITS 1 AND 2
NOVEMBER/DECEMBER 2012
SURFACE WATER/SEDIMENT SAMPLING EVENT

OLIN CHEMICAL SUPERFUND SITE
51 EAMES STREET
WILMINGTON, MASSACHUSETTS

Submitted to:

Olin Corporation
3855 North Ocoee Street, Suite 200
Cleveland, TN 37312

Prepared by:

AMEC Environment & Infrastructure, Inc.
107 Audubon Road
Wakefield, Massachusetts 01880

April 9, 2013

AMEC Project Number: 6107130016.01.10

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TABLE OF CONTENTS

1.0 INTRODUCTION 1-1

2.0 VOLATILE ORGANIC COMPOUNDS 2-1
- 2.1 Blanks 2-1
- 2.2 Laboratory Control Samples (LCS) 2-1
- 2.3 Initial and Continuing Calibration Standards 2-2
- 2.4 Tentatively Identified Compounds 2-3

3.0 SEMIVOLATILE ORGANIC COMPOUNDS 3-1
- 3.1 Blanks 3-1
- 3.2 Initial and Continuing Calibration Standards 3-2
- 3.3 Laboratory Control Samples 3-2
- 3.4 Detection Limits 3-3
- 3.5 Sample Result Verification 3-4
- 3.6 Tentatively Identified Compounds 3-4

4.0 N-NITROSODIMETHYLAMINE & N-NITROSODI-N-PROPYLAMINE 4-1
- 4.1 Initial Calibration 4-1
- 4.2 Detection Limits 4-2

5.0 TARGET ANALYTE LIST METALS (INCLUDING MERCURY) 5-1
- 5.1 Data Completeness 5-1
- 5.2 Blanks 5-1
- 5.3 Initial Calibration - Quantitation Limit Check Standard 5-2
- 5.4 Instrument Tune (ICP-MS) 5-3
- 5.5 Matrix Spikes 5-3

6.0 HEXAVALENT CHROMIUM 6-1
- 6.1 LCS 6-1
- 6.2 Detection Limits 6-1

7.0 GENERAL CHEMISTRY (ANIONS, AMMONIA, TOC, HARDNESS, TSS, ORP, PH) 7-1
- 7.1 Holding Time 7-1
- 7.2 Blanks 7-1
- 7.3 Detection Limits 7-2

8.0 FORMALDEHYDE/ACETALDEHYDE 7-1
- 8.1 Matrix Spike Analysis 7-1

9.0 PHTHALIC ANHYDRIDE 7-1
- 9.1 Matrix Spike Analysis 7-1

10.0 HYDRAZINE, MONOMETHYLHYDRAZINE, UNSYMMETRICAL DIMETHYLHYDRAZINE 7-1

11.0 N, N-DIMETHYLFORMAMIDE 7-1

12.0 OPEX AND KEMPORE 7-1
- 12.1 Holding Time and Sample Preservation 7-1
- 12.2 Initial and Continuing Calibration Standards 7-1

13.0 REFERENCES 13-1

TABLES

Table 1 Sample Summary
Table 2 Final Results Summary
Table 3 Data Validation Action Summary
Table 4-1 Tentatively Identified Compounds - VOCs
Table 4-2 Tentatively Identified Compounds - SVOCs

LIST OF ACRONYMS

APHA	American Public Health Association
AMEC	AMEC Environment & Infrastructure, Inc.
DMF	N,N-Dimethylformamide
EDD	Electronic Data Deliverable
GC/NPD	Gas Chromatograph/Nitrogen-Phosphorous Detector
HPLC	High Performance Liquid Chromatography
J	Estimated value
LC/MS/MS	Liquid Chromatography/Dual Mass Spectrometry
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MACTEC	MACTEC Engineering and Consulting, Inc.
MassDEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MMH	Monomethylhydrazine
MS/MSD	Matrix Spikes/Matrix Spike Duplicate
µg/L	Microgram per liter
ND	Non-detect
NDMA	N-nitrosodimethylamine
NDPrA	N-nitrosodipropylamine
PE	Performance Evaluation
QAPP	Quality Assurance Project Plan
QC	Quality Control
RI/FS	Remedial Investigation/Feasibility Study
RPD	Relative Percent Difference
SDG	Sample Delivery Group
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TIC	Tentatively Identified Compound
TOC	Total Organic Carbon
TSS	Total Suspended Solids
U	Not detected

UDMH	Unsymmetrical Dimethylhydrazine
UJ	Not detected estimated
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Surface water and sediment samples were collected at the Olin Chemical Superfund Site on November 6, 2012 and December 17, 2012 as specified in the Remedial Investigation/Feasibility Study (RI/FS) Work Plan (MACTEC Engineering and Consulting, Inc. [MACTEC], 2009, now AMEC Environment & Infrastructure, Inc.) and the Supplemental Work Plan – Operable Unit 1 (Olin, 2012/2013). Samples were analyzed by one or more of the following United States Environmental Protection Agency (USEPA) SW-846 (USEPA, 1996a), USEPA wastewater (USEPA, 1993), Standard Methods American Public Health Association ([APHA], 1995) or laboratory developed methods:

Laboratory	Parameter	Analytical Method	Validation Level
TestAmerica - Buffalo, NY	Volatile Organic Compounds (VOCs)	SW-846 8260C	Tier II/III
TestAmerica - Buffalo, NY	Semivolatile Organic Compounds (SVOCs)	SW-846 8270D – Low Level	Tier II/III
TestAmerica - Buffalo, NY	Diphenylamine (November sediment only)	SW-846 8270D – Low Level	Tier II
TestAmerica - West Sacramento, CA	N-Nitrosodimethylamine (NDMA) & N-nitroso-di-n-propylamine (NDPrA) – surface water	Modified 521 (WS-MS-0012)	Olin Level I
TestAmerica - West Sacramento, CA	NDMA – sediment	Modified 521 (WS-MS-0012)	Olin Level I
TestAmerica - Buffalo, NY	Target Analyte List (TAL) Metals plus tin	SW-846 6010C/ Hg by 7470A (surface water) and 7471A (sediment)	Tier II/III
TestAmerica - Buffalo, NY	Metals (copper, lead, silver)	SW-846 6020A	Tier II/III
TestAmerica – Westfield, MA	Hexavalent Chromium (Cr+6) in Surface Water	SW-846 7196	Chemist Review
TestAmerica – Edison, NJ	Hexavalent Chromium (Cr+6) in Sediment	SW-846 7199	Chemist Review
TestAmerica - Buffalo, NY	Ammonia	QuickChem: LACHAT 10-107-06-1-B	Olin Level 1
TestAmerica - Buffalo, NY	Anions (chloride, sulfate, bromide)	EPA 300.0	Olin Level 1
TestAmerica - Buffalo, NY	Anions (nitrate, nitrite)	EPA 353.2	Olin Level 1
TestAmerica - Buffalo, NY	Total Organic Carbon (TOC)	SM 5310D (surface water) SW9060 (sediment)	Chemist Review
TestAmerica - Buffalo, NY	Hardness	SM 2340B	Chemist Review
TestAmerica - Buffalo, NY	Total Suspended Solids (TSS)	SM 2540D	Chemist Review

Laboratory	Parameter	Analytical Method	Validation Level
TestAmerica – Westfield, MA	Oxidation Reduction Potential (ORP) / pH	SM2580B / SW9045C	Olin Level 1
TestAmerica - Tallahassee, FL	Formaldehyde / Acetaldehyde	SW-846 8315A	Chemist Review
TestAmerica - Tallahassee, FL	Phthalic Anhydride	Lab Specific TAL-TALL LC65	Chemist Review
Lancaster Laboratory - Lancaster, PA	Hydrazine / monomethylhydrazine (MMH) / unsymmetrical dimethylhydrazine (UDMH)	Modified 8315 LC/MS/MS	Chemist Review
Katahdin Analytical Services - Scarborough, ME	N,N-dimethylformamide	Modified 8033 - GC/NPD	Chemist Review
Lancaster Laboratory - Lancaster, PA	Opex and Kempore	Lab Specific HPLC Method 8000B	Chemist Review

A summary of samples (by sample delivery group [SDG]) included in this data validation report is presented in Table 1. Analytical data packages were reviewed in accordance with the Olin Chemical Superfund Site Final RI/FS Work Plan Quality Assurance Project Plan (QAPP) [MACTEC, 2009]. Volatile organic compounds (VOCs), semivolatile organic compounds (SVOC), and metals data were validated using the Region I EPA-New England Data Validation Functional Guidelines (USEPA, 1996b) and the Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) (MassDEP, 2010). USEPA Region I data validation procedures for SW-846 Methods were modified to include method-specific criteria (i.e., measurement performance criteria detailed in the QAPP) from the MCP Methods. For other methods that were not addressed in USEPA Region I guidelines or the MCP Compendium, method performance criteria were developed for this project. Validation levels for each method (Tier II/III, Olin Level 1, chemist review) are summarized above.

Final validated sample results are presented in Table 2. Documentation of data validation actions is presented in Table 3. Table 3 includes final results that have been qualified (data validation has resulted in revisions to the laboratory result) as well as the associated validation reason codes. An index of the reason codes is presented on the last page of Table 3.

Tentatively identified compounds (TICs) were reported by the laboratory, if detected, in samples analyzed for VOCs and SVOCs. TICs were evaluated during validation and were removed from the data set if reported in associated method blanks. VOC and SVOC TICs, discussed in Sections 2 and 3, are presented by SDG in Tables 4-1 and 4-2, respectively.

Performance evaluation (PE) samples were submitted to the laboratory during previous rounds of RI groundwater sampling. No PE samples were submitted with this round of sampling.

For surface water, NDMA and NDPrA were included as SVOC target compounds in SW-846 Method 8270D and the low detection limit analysis by modified USEPA Method 521. Both sets of data were reported by the laboratory. The Method 521 results had lower reporting limits and were used for reporting final results for surface water samples. The SW-846 Method 8270D results for NDMA and NDPrA were removed from the final data set.

For sediment, NDMA was included as a SVOC target compound in SW-846 Method 8270D and the low detection limit analysis by modified USEPA Method 521. Both sets of data were reported by the laboratory. The Method 521 data had lower reporting limits when compared to the SVOC method and was used for reporting final results for sediment samples. The SW-846 Method 8270D results for NDMA were removed from the final data set.

2.0 VOLATILE ORGANIC COMPOUNDS

Samples were analyzed for VOCs by SW-846 Method 8260C. Data were evaluated based on the following parameters:

* Data Completeness
* Holding Times and Preservation
  Blanks
* Surrogate Recovery
  Laboratory Control Sample (LCS)
* Instrument Tunes
  Initial and Continuing Calibration Standards
* Internal Standards
* Matrix Spikes
* Field Duplicates
* Detection Limits
* Sample Result Verification / Electronic Data Deliverable (EDD)
* TICs

* = indicates that criteria were met for this parameter

Except for the validation actions noted below, sample results are interpreted to be usable as reported by the laboratory.

2.1 Blanks

Qualified results are summarized on Table 3 with a reason code BL1.

<u>Surface Water</u>

SDG 480-27937-1

Trichloroethene (0.46 µg/L) was detected in the method blank associated with sample OC-SW-EDSD/SW7-XXX. An action level was established at five times the concentration reported in the blank and compared to the associated sample result. Trichloroethene was detected at 2.1 µg/L and qualified as not detected in OC-SW-EDSD/SW7-XXX.

2.2 Laboratory Control Samples

A subset of sample results was qualified due to LCS recoveries that were outside project Quality Control (QC) goals. Qualified results are summarized on Table 3 with a reason code LCS-H or LCS-L.

Surface Water

SDG 480-30497-1

Percent recovery of 2-butanone (131) was above the QC limits. Positive detections of 2-butanone were qualified as estimated (J).

Sediment

SDG 480-30406-1

Percent recovery of bromomethane (67) was below the QC limits. Bromomethane was not detected in associated samples and quantitation limits were qualified as estimated (UJ) in all sediment samples.

2.3 Initial and Continuing Calibration Standards

A subset of sample results was qualified due to instrument calibration measurements that were outside project QC goals. Qualified results are summarized on Table 3 with reason codes of ICVRPD, ICVRRF, CCVRRF, and CCV%D.

Surface Water

SDG 480-27937-1

In the initial calibration associated with sample OC-SW-EDSD/SW7-XXX, the relative response factor (RRF) for 1,4-dioxane did not meet the minimum average RRF limit in the USEPA Region I validation guidelines (>0.05), but did meet the minimum average RRF limit set by the USEPA Contract Laboratory Program (CLP) (>0.005). The average RRF was 0.0068. Based on professional judgment, the reporting limit for 1,4-dioxane was qualified as estimated (UJ).

In the continuing calibration standard associated with OC-SW-EDSD/SW7-XXX, the following compounds had a percent difference (%D) greater than 25: 1,4-dioxane (30), hexachlorobutadiene (26), and 2,4,4-trimethyl-2-pentene (26). These compounds were not detected and the reporting limits were qualified estimated (UJ). 1,4-Dioxane had a RRF of 0.0089 in the continuing calibration standard.

SDG 480-30497-1

The relative response factors (RRFs) for 1,4-dioxane were below the minimum criteria for initial calibration average RRF and continuing calibration RRF specified in the USEPA Region I validation guidelines (>0.05), and were below the minimum average RRF limit set by the USEPA Contract Laboratory Program (CLP) (>0.005). The initial calibration average RRF was 0.0040 and the continuing calibration RRF was 0.0036. 1,4-Dioxane was not detected in the

surface water samples, and results were qualified as rejected (R) following USEPA validation guidelines.

Sediment

SDG 480-27939-1

In the initial calibration associated with sample OC-SD-EDSD/SW7-XXX, the relative response factor (RRF) for 1,4-dioxane did not meet the minimum average RRF limit in the USEPA Region I validation guidelines (>0.05), but did meet the minimum average RRF limit set by the USEPA Contract Laboratory Program (CLP) (>0.005). The average RRF was 0.01. Based on professional judgment, the reporting limit for 1,4-dioxane was qualified as estimated (UJ).

In the continuing calibration standard associated with OC-SD-EDSD/SW7-XXX, 1,4-dioxane had a RRF of 0.0089 in the continuing calibration standard. 1,4-Dioxane was qualified estimated (UJ) during the review of the associated initial calibration.

SDG 480-30406-1

The RRFs for 1,4-dioxane were below the minimum criteria for initial calibration average RRF and continuing calibration RRF specified in the USEPA Region I validation guidelines (>0.05), but were above the minimum average RRF limit set by the USEPA Contract Laboratory Program (CLP) (>0.005). The initial calibration average RRF was 0.015 and the continuing calibration RRF was 0.013. 1,4-Dioxane was not detected in the sediment samples, and based on professional judgment the reporting limits were qualified as estimated (UJ).

2.4 Tentatively Identified Compounds

Tentatively Identified Compounds (TICs) reported in the samples were evaluated by the project chemist. TICs reported in QC blanks and those identified as common lab contaminants in the validation guidelines were removed from the final Tentatively Identified Compound (TIC) data summary (Table 4-1).

3.0 SEMIVOLATILE ORGANIC COMPOUNDS

Samples were analyzed for SVOCs by SW-846 Method 8270D (low level method). Additional analyses for diphenylamine were requested for sediment sample OC-SD-EDSD/SW7-XXX. The routine SVOC method cannot distinguish between diphenylamine and N-nitrosodiphenylamine and all results for both compounds are reported as N-nitrosodiphenylamine in SW-846 Method 8270D. Clean up procedures described in the QAPP to allow separation of diphenylamine and N-nitrosodiphenylamine were requested at the time of sample collection. The lab was instructed to perform the cleanup and report separate results for the two compounds if N-nitrosodiphenylamine was detected. N-nitrosodiphenylamine was not detected in sample OC-SD-EDSD/SW7-XXX, and diphenylamine was reported as non-detect (ND) by the lab for this sample.

Data were reviewed based on the following parameters:

* Data Completeness
* Holding Times and Preservation
  Blanks
* Surrogate Recovery
  Laboratory Control Sample
* Instrument Tunes
  Initial and Continuing Calibration Standards
* Internal Standards
* Matrix Spikes
* Field Duplicates
  Detection Limits
  Sample Result Verification / EDD
  TICs

* = indicates that criteria were met for this parameter

Except for the validation actions noted below, the results are interpreted to be usable as reported by the laboratory.

3.1 Blanks

<u>Surface Water</u>

SDG 480-27937-1

Benzaldehyde was detected at 0.192 µg/L in the method blank associated with surface water sample OC-SW-EDSD/SW7-XXX. Benzaldehyde was detected below the detection limit in the sample (0.075 µg/L) and was qualified as not detected (U) at the reporting limit of 4.9 µg/L in the final data set.

3.2 Initial and Continuing Calibration Standards

A subset of sample results was qualified due to continuing calibration percent differences that were outside project QC goals. Qualified results are summarized on Table 3 with a reason code of CCV%D.

Surface Water

SDG 480-27937-1

In the continuing calibration standard associated with OC-SW-EDSD/SW7-XXX, the following compounds had a percent difference (%D) greater than 25: hexachlorocyclopentadiene (25.9) and 2,4-dinitrophenol (29). These compounds were not detected and the reporting limits were qualified estimated (UJ).

SDG 480-30497-1

In the continuing calibration standard associated with all surface water samples, the following compounds had percent differences (%Ds) between the initial calibration average RRFs and continuing calibration RRFs that were greater than 25: 2,4,6-trichlorophenol (27) and 2,3,4,6-tetrachlorophenol (46). These compounds were not detected and the reporting limits were qualified estimated (UJ) in all surface water samples.

3.3 Laboratory Control Samples

A subset of sample results was qualified due to LCS and/or Laboratory Control Sample Duplicate (LCSD) percent recoveries and/or relative percent differences (RPDs) between recoveries that were outside project QC goals. Qualified results are summarized on Table 3 with reason codes of LCS-L or LCS-RPD.

Surface Water

SDG 480-27937-1

The following compounds had percent recoveries that were outside the control limits in one or more LCS/LCSD runs: caprolactam (30 and 30), benzoic acid (0.6 and 0), 2,4-dinitrophenol (17), 4-nitrophenol (0). Caprolactam and 2,4-dinitrophenol were not detected in the associated sample (OC-SW-EDSD/SW7-XXX) and the reporting limits were qualified estimated (UJ). Benzoic acid and 4-nitrophenol were recovered at less than ten percent of the final result and was rejected (R) in sample OC-SW-EDSD/SW7-XXX. RPDs between recoveries were outside the control limit for benzoic acid (200), 2-chloronaphthalene (105), 2,4-dinitrophenol (117), and 4-nitrophenol (200).

SDG 480-30497-1

The following compounds had percent recoveries that were outside the control limits in the LCS/LCSD: caprolactam (29, 26), benzoic acid (0.6, 1), and 4-nitrophenol (24, 21). RPDs between recoveries were outside the control limit for 2,4-dichlorophenol (25), benzo(b)fluoranthene (22), and benzoic acid (54). These analytes were not detected in the surface water samples, and reporting limits for caprolactam, 4-nitrophenol, 2,4-dichlorophenol, and benzo(b)fluoranthene were qualified as estimated (UJ). Benzoic acid was not detected in the surface water samples and the LCS and LCSD were recovered at less than ten percent; therefore, the final results were qualified as rejected (R) in all surface water samples.

Sediment

SDG 480-27939-1

In the LCS/LCSD associated with sample OC-SD-EDSD/SW7-XXX, the following compounds had percent recoveries that were outside of control limits: 2,4-dinitrophenol (0, 0), 2,6-dinitrotoluene (24, 27), N-nitrosodiphenylamine (36, 38), 4-nitrophenol (0), 4,6-dinitro-2-methylphenol (0), benzoic Acid (0), and benzyl alcohol (35). RPDs between recoveries were outside the control limit for 4-nitrophenol (200) and 4,6-dinitro-2-methylphenol (200). 2,4-Dinitrophenol, 4-nitrophenol, and 4,6-dinitro-2-methylphenol were not detected in the sample and the final results were rejected (R). 2,6-Dinitrotoluene, benzyl alcohol and n-nitrosodiphenylamine were not detected and results were qualified estimated (UJ). Benzoic acid was detected at 160 µg/kg and was qualified as estimated (J) in the final data set.

SDG 480-30406-1

The following compounds had percent recoveries that were outside the control limits in the LCS and/or LCSD: 4-nitrophenol (14) and azobenzene (268, 258). RPDs between recoveries were outside the control limit for 4-nitrophenol (147) and 2,4-dinitrophenol (74). These analytes were not detected in the sediment samples, and reporting limits for 4-nitrophenol and 2,4-dinitrophenol were qualified as estimated (UJ). Azobenzene was not detected in the sediment samples and results were reported unqualified.

3.4 Detection Limits

Sediment

SDG 480-30406-1

All sediment samples were analyzed at ten-fold dilutions due to matrix interferences. Elevated reporting limits (10x) are reported for all analytes that were not detected in the sediment samples.

3.5 Sample Result Verification

Surface Water

SDG 480-27937-1 and 480-30497-1

NDMA and NDPrA were analyzed using both the 8270D and modified 521 methods. Results from the modified 521 with lower reporting limits were reported in the final data set.

Sediment

SDG 480-27939-1 and 480-30406-1

N-nitrosodimethylamine was analyzed using both the 8270D and modified 521 methods. Results from the modified 521 with lower reporting limits were reported in the final data set.

3.6 Tentatively Identified Compounds

Tentatively Identified Compounds (TICs) reported in the samples were evaluated by the project chemist. TICs reported in QC blanks and those identified as common lab contaminants in the validation guidelines were removed from the final TIC data summary (Table 4-2).

During validation a possible TIC compound peak was found that was not reported by the laboratory as a TIC. The peak was observed in the chromatogram for sample OC-SD-SD-504-XXX at an approximate retention time (RT) of 17 minutes. The target compound benzo(a)pyrene co-elutes with this peak and was reported for sample OC-SD-SD-504-XXX. A peak at the same RT was identified and reported as a TIC (p,p'-dioctyldiphenylamine) in sample OC-SD-SD-503-XXX at a concentration of approximately 31,000 µg/kg. Based on review of the chromatograms and associated mass spectra provided for both samples, the peak at RT 17 in sample OC-SD-SD-504-XXX should have been reported as a TIC, and does include a small contribution from the reported target compound benzo(a)pyrene. The TIC portion of the peak at RT 17 in OC-SD-SD-504-XXX is interpreted to be the same compound reported in OC-SD-SD-503-XXX (p,p'-dioctyldiphenylamine).

4.0 N-NITROSODIMETHYLAMINE & N-NITROSODI-N-PROPYLAMINE

Sediment and surface water samples were analyzed for NDMA by modified USEPA Method 521 Modified (TAL method WS-MS-0012). NDPrA was also reported as a target analyte for surface waters by Method 521 Modified. Data were evaluated based on the following parameters:

- Data Completeness
- * Holding Times and Preservation
- * Blanks
- * Instrument Tunes
- Initial and Continuing Calibration Standards
- * Laboratory Control Sample
- * Matrix Spikes
- * Field Duplicates
- * Internal Standard Response
- Detection Limits
- * Sample Result Verification / EDD

* = indicates that criteria were met for this parameter

Except for the validation actions noted below, the results are interpreted to be usable as reported by the laboratory. A summary of final results is presented on Table 2. A summary of data validation actions is presented on Table 3.

4.1 Initial Calibration

<u>Surface Water</u>

SDG 480-27937-1

The percent relative standard deviation (%RSD) of the relative response factors (RRFs) of NDMA in the initial calibration analyzed on November 3, 2012 (22) was above the control limit of 20. The laboratory used a quadratic regression for the calibration with a R^2 of 0.9940. NDMA was not detected in the associated surface water sample (OC-SW-EDSD/SW7-XXX) and the reporting limit was qualified estimated (UJ).

SDG 480-30497-1

The percent relative standard deviation (%RSD) of the relative response factors (RRFs) of NDMA in the initial calibration analyzed on December 4, 2012 (27) was above the control limit of 20. The laboratory used a quadratic regression for the calibration with a R^2 of 0.9950. The results for NDMA were qualified estimated (J/UJ) in surface waters reported in SDG 480-30497-1.

Sediment

SDG 480-27939-1 and 480-30406-1

The percent relative standard deviation (%RSD) of the relative response factors (RRFs) of NDMA in the initial calibration analyzed on December 4, 2012 (27) was above the control limit of 20. The laboratory used a quadratic regression for the calibration with a R^2 of 0.9940. NDMA was not detected in the associated sediment sample (OC-SD-EDSD/SW7-XXX) and the reporting limit was qualified estimated (UJ).

4.2 Detection Limits

The project action limit of NDMA for the program is 5 µg/kg.

Sediment

SDG 480-27939-1

Due to matrix effects and interference present in the sample extract of sediment sample OC-SD-EDSD/SW7-XXX, the laboratory was only able to concentrate the final extract to a volume of 3 milliliters (mL) instead of the targeted 0.5 mL. The NDMA result is not detected (U) at an elevated reporting limit of 40 µg/kg in this sample.

5.0 TARGET ANALYTE LIST METALS (INCLUDING MERCURY)

Samples were analyzed for TAL metals (plus tin) by SW-846 Method 6010C and Method 6020A (copper, lead and silver in surface water), and mercury by SW-846 Method 7470A (surface water) and 7471A (sediment). Data were reviewed for the following parameters:

- Data Completeness
- * Sample Preservation and Holding Times
- Blanks
- Initial and Continuing Calibration Standards
- * LCS/LCSD
- Instrument Tune (inductively coupled plasma [ICP]-MS)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD)
- * Field Duplicates
- * Laboratory Duplicate Analysis
- * Interference Check Sample
- * Internal Standards (ICP-MS)
- * Serial Dilution Analysis
- * Detection Limits
- * Total and dissolved metals concentration comparison
- * Sample Result Verification / EDD

* = indicates that criteria were met for this parameter

Except for the validation actions noted below, the results are interpreted to be usable as reported by the laboratory. A summary of final results is presented on Table 2. A summary of data validation actions is presented on Table 3.

5.1 Data Completeness

<u>Sediment</u>

SDG 480-27939-1

The laboratory did not report tin in sample OC-SD-EDSD/SW7-XXX.

5.2 Blanks

The laboratory qualified sample results associated with method blank detections with a B. After review of the method blanks, the B qualifiers were removed.

Surface Water

SDG 480-27937-1

Aluminum (0.0693 mg/L) was detected in the calibration blank associated with sample OC-SW-EDSD/SW7-XXX. Action levels were established at five times the concentration reported in the blank and compared to the sample result. A low level detection of aluminum (0.14 mg/L) was detected below the reporting limit and action level. Aluminum was qualified not detected (U) at the reporting limit of 0.2 mg/L in sample OC-SW-EDSD/SW7-XXX.

5.3 Initial Calibration - Quantitation Limit Check Standard

Surface Water

SDG 480-27937-1

Tin was recovered at 54 and 63 percent in the quantitation limit check standard and was below the QC limit of 70. Tin was not detected in the associated sample (OC-SW-EDSD/SW7-XXX) and the reporting limit was qualified estimated (UJ).

SDG 480-30497-1

The percent recoveries of tin (59 and 58) and chromium (131) were outside of the QC limits (70-130) in the quantitation limit check standard associated with the surface water samples reported in SDG 480-30497-1. The following sample results were qualified estimated (J/UJ) in the final data set:

Sample ID	Analyte	Lab Result (µg/L)	Lab Qualifier	Final Result (µg/L)	Final Qualifier
OC-SW-SD-501-XXX	Tin	10	U	10	UJ
OC-SW-SD-503-XXX	Chromium	6.8		6.8	J
OC-SW-SD-503-XXX	Tin	10	U	10	UJ
OC-SW-SD-1-XXX	Tin	10	U	10	UJ
OC-SW-PZ-17RR-XXX	Tin	10	U	10	UJ

Sediment

SDG 480-27939-1

Silver (137) and arsenic (137) were recovered above the QC limit of 130 in the reporting limit check standard associated with sediment sample OC-SD-EDSD/SW7-XXX. A detect for silver was reported in the sample at less than two times the concentration of the quantitation limit check standard. The final result for silver was qualified estimated (J) in sample OC-SD-

EDSD/SW7-XXX. Arsenic was detected in the sample at a concentration greater than two times the concentration of the quantitation limit check standard and was not qualified.

SDG 480-30406-1

CRDL Standards

Percent recoveries of silver (52) and tin (58) were below the 70-130 control limits in the CRDL standard associated with all sediment samples. Positive detections of tin were reported for all samples and results were qualified as estimated (J) and may represent potential low biases. Silver was not detected in any of the samples and reporting limits were qualified as estimated (UJ).

5.4 Instrument Tune (ICP-MS)

Surface Water

SDG 480-30497-1

In the ICP-MS tune analyzed on December 26, 2012, the laboratory reported a %RSD between the absolute signals in the tuning solution that was above the Region I control limit of 5 for the masses: mass 8 (%RSD of 39), mass 102 (16.4), mass 207 (5.8), mass 237 (9.7). Analytes reported by Method 6020 ICP-MS (copper, lead and silver) were qualified estimated (J/UJ) in surface water samples reported in SDG 480-30497-1.

5.5 Matrix Spikes

Sediment

SDG 480-27939-1

A MS/MSD analysis was performed on sediment sample OC-SD-EDSD/SW7-XXX. The following metals had percent recoveries that were outside of the 75-125% control limits: barium (142), chromium (39), nickel (156), lead (53 and -15), magnesium (127 and 127), potassium (126), copper (74 and -9), and aluminum (187 and 158). These metals were detected in sample OC-SD-EDSD/SW7-XXX and results were qualified estimated (J) in the final data set. The percent recoveries for these analytes were within the 75-125 percent control limit in the post digestion spike analyzed on sample OC-SD-EDSD/SW7-XXX.

SDG 480-30406-1

MS/MSD

Percent recoveries of aluminum (140), selenium (73), and iron (71) were outside the 75-125 control limits in the MS and/or MSD associated with sample OC-SD-SD-502-XXX. Positive detections of aluminum in all samples were qualified as estimated (J) and may represent potential high biases. Positive and non-detect results for selenium and iron were qualified as estimated (J/UJ) in all samples and may represent potential low biases.

6.0 HEXAVALENT CHROMIUM

Sediment samples were analyzed using SW-846 Method 7199. Surface water samples were requested to be analyzed for hexavalent chromium (chromium+6) by SW-846 Method 7199 on the chain of custody; however, the laboratory was unable to meet holding times using SW-846 Method 7199 and samples were analyzed by SW-846 Method 7196. Data were reviewed for the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Initial and Continuing Calibration Standards
  Laboratory Control Sample
* Matrix Spike Analysis
* Laboratory Duplicate Analysis
* Field Duplicates
  Detection Limits
* Sample Result Verification / EDD

* = indicates that criteria were met for this parameter

Except for the validation actions noted below, the results are interpreted to be usable as reported by the laboratory. A summary of final results is presented on Table 2. A summary of data validation actions is presented on Table 3.

6.1 LCS

Laboratory control samples were evaluated based on percent recovery control limits of 80-120.

<u>Sediment</u>

SDG 480-30406-1

The percent recovery of the LCS (66) associated with sediment samples in SDG 480-30406-1 was below the lower control limit of 80. The results for hexavalent chromium in sediment samples reported in SDG 480-30406-1 were qualified estimated (J/UJ) in the final data set. Qualified results are summarized on Table 3 with a reason code of LCS-L.

6.2 Detection Limits

<u>Surface Water</u>

SDG 480-30497-1

The reporting limit of hexavalent chromium in surface water samples reported in SDG 480-30497-1 of 5 µg/L was greater than the project quantitation limit of 1 µg/L identified in the QAPP. This reporting limit concentration is below the human health and ecological project action limit of 11 µg/L identified in the QAPP.

7.0 GENERAL CHEMISTRY (ANIONS, AMMONIA, TOC, HARDNESS, TSS, ORP, PH)

An Olin Level 1 validation was performed on the data. Data were evaluated based on the following parameters:

* Data Completeness
  Holding Time
  Blanks
* Laboratory Control Sample
* Matrix Spike Analysis
* Laboratory Duplicate Analysis
* Field Duplicates
  Detection Limits
* Sample Result Verification / EDD

***** = indicates that criteria were met for this parameter

Except for the validation actions noted below, the results are interpreted to be usable as reported by the laboratory.

7.1 Holding Time

Surface Water

SDG 480-30497-1

Surface water samples reported in SDG 480-30497-1 were collected on December 17, 2012 and analyzed for nitrate and nitrite one day past the 48 hour hold time. Nitrate and nitrite results were qualified as estimated (J) in the final data set.

7.2 Blanks

Sediment

SDG 480-27939-1

Nitrate/nitrite was detected in the method blank at 0.198 mg/kg associated with sample OC-SD-EDSD/SW7-XXX. An action level was established at five times the concentration detected in the blank. Nitrate was detected below the reporting limit and action level at 0.79 mg/kg in sample OC-SD-EDSD/SW7-XXX and was qualified as not detected at the reporting limit of 0.99 mg/kg.

7.3 Detection Limits

Surface Water

SDG 480-27937-1

Nitrite was not detected in sample OC-SW-EDSD/SW7-XXX at a reporting limit of 0.05 mg/L and a MDL of 0.011 mg/L. This reporting limit is slightly higher than the project quantitation limit of 0.01 mg/L specified in the QAPP for nitrite.

8.0 FORMALDEHYDE/ACETALDEHYDE

Samples were analyzed for formaldehyde and acetaldehyde by SW-846 Method 8315. Data were evaluated based on the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Laboratory Control Sample
  Matrix Spike Analysis
* Detection Limits
* Sample Result Verification / EDD

* = indicates that criteria were met for this parameter

Except for the validation actions noted below, the results are interpreted to be usable as reported by the laboratory.

8.1 Matrix Spike Analysis

Sediment

Sample OC-SD-EDSD/SW7-XXX was submitted for MS/MSD analysis. The MS percent recovery for formaldehyde (66) and the MS/MSD percent recovery for acetaldehyde (49 and 46) were less than the lower QC limit of 70. The results for formaldehyde and acetaldehyde in sample OC-SD-EDSD/SW7-XXX were qualified estimated (J).

9.0 PHTHALIC ANHYDRIDE

Samples were analyzed for phthalic anhydride by a laboratory specific modified method 8000 – High Performance Liquid Chromatography (HPLC) (TestAmerica – Tallahassee: method LC65). A chemist review was performed on the phthalic anhydride data set. Data were evaluated based on the following parameters:

* Data Completeness
* Holding Time and Preservation
* Blanks
* Laboratory Control Sample
  Matrix Spike Analysis
* Detection Limits
* Sample Result Verification / EDD

* = indicates that criteria were met for this parameter

Except for the validation actions noted below, the results are interpreted to be usable as reported by the laboratory.

9.1 Matrix Spike Analysis

<u>Sediment</u>

Sample OC-SD-EDSD/SW7-XXX was submitted for MS/MSD analysis. The MS/MSD percent recoveries for phthalic anhydride (67 and 65) were less than the lower QC limit of 70. The reporting limit for phthalic anhydride in sample OC-SD-EDSD/SW7-XXX was qualified estimated (UJ).

10.0 HYDRAZINE, MONOMETHYLHYDRAZINE, UNSYMMETRICAL DIMETHYLHYDRAZINE

Samples were analyzed for hydrazine, MMH and UDMH by a modified SW-846 Method 8315A Liquid Chromatography/Dual Mass Spectrometry (LC/MS/MS). Reporting limits were hydrazine (2 µg/kg), MMH (5 µg/kg), and UDMH (5 µg/kg) for solid samples. Data were evaluated based on the following parameters:

* Data Completeness
* Holding Time and Sample Preservation
* Blanks
* Initial and Continuing Calibration Standards
* Laboratory Control Sample
* Detection Limits
* Sample Result Verification / EDD

* = indicates that criteria were met for this parameter

The results are interpreted to be usable as reported by the laboratory.

11.0 N, N-DIMETHYLFORMAMIDE

Samples were analyzed for N,N-Dimethylformamide (DMF) by a modified SW-846 Method 8033 gas chromatograph/nitrogen-phosphorous detector (GC/NPD). Reporting limits were 0.20 mg/kg dry weight for non-aqueous samples. Data were reviewed for the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Initial and Continuing Calibration Standards
* Laboratory Control Sample
* Surrogate Recovery
* Detection Limits
* Sample Result Verification / EDD

* = indicates that criteria were met for this parameter

The results are interpreted to be usable as reported by the laboratory.

12.0 OPEX AND KEMPORE

Samples were analyzed for Opex and Kempore by modified Method 8000B – HPLC (Lancaster Laboratory – Lancaster, Pennsylvania: Determination of Dinitrosopentamethylenetetramine (Opex) in Water, and Determination of Azodicarbonamide (Kempore) in Water). A chemist review was performed on the Opex and Kempore data sets. Data were reviewed for the following parameters:

* Data Completeness
  Holding Time and Preservation
* Blanks
  Initial and Continuing Calibration Standards
* Laboratory Control Sample
* Detection Limits
* Compound Identification
* Sample Result Verification / EDD

* = indicates that criteria were met for this parameter

Except for the validation actions noted below, the results are interpreted to be usable as reported by the laboratory.

12.1 Holding Time and Sample Preservation

Surface Water

Sample OC-SW-EDSD/SW7-XXX was collected on November 6, 2012 and analyzed on November 15 2012. Holding time was exceeded by two days. Kempore and Opex were not detected in sample OC-SW-EDSD/SW7-XXX and the reporting limits were qualified estimated (UJ).

12.2 Initial and Continuing Calibration Standards

Surface Water

The continuing calibration standard percent recoveries for Kempore ranged from 48 to 57 and were less than the lower QC limit of 85. The reporting limit for Kempore in sample OC-SW-EDSD/SW7-XXX was qualified estimated (UJ).

13.0 REFERENCES

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USEPA, 1996b. "Region 1 EPA-NE Data Validation Guidelines for Evaluating Environmental Analyses"; Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December 1996.

Data validation was completed by project chemists:

- Tige Cunningham – NRCC-EAC
- Wolfgang Calicchio
- Julie Ricardi

TABLES

Table 1 - Sample Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Location	Field Sample ID	Date Sampled	TestAmerica Sample ID	SW8260C VOCs	SW8270D SVOCs	WS-MS-0012 NDMA	SW6010 Metals Total	SW6020 Metals Total	SW7471A/ SW7470A Mercury Total	SW7199/ SW7196A Cr+6	E300 Chloride Sulfate Bromide	E350.1 (QuickChem 10-107-06-1-B) Ammonia
Sediment												
EDSD/SW7	OC-SD-EDSD/SW7-XXX	11/6/2012	480-27939-1	77	73	1	22		1		2	1
SD-503	OC-SD-SD-503-XXX	12/17/2012	480-30406-1	77	73	1	23		1	1	2	1
SD-504	OC-SD-SD-504-XXX	12/17/2012	480-30406-2	77	73	1	23		1	1	2	1
SD-501	OC-SD-SD-501-XXX	12/17/2012	480-30406-3	77	73	1	23		1	1	2	1
SD-502	OC-SD-SD-502-XXX	12/17/2012	480-30406-4	77	73	1	23		1	1	2	1
Surface Water												
EDSD/SW7	OC-SW-EDSD/SW7-XXX	11/6/2012	480-27937-1	77	71	2	20	3	1		3	1
SD-501	OC-SW-SD-501-XXX	12/17/2012	480-30497-1	77	71	2	20	3	1	1	3	1
SD-503	OC-SW-SD-503-XXX	12/17/2012	480-30497-2	77	71	2	20	3	1	1	3	1
SD-1	OC-SW-SD-1-XXX	12/17/2012	480-30497-3	77	71	2	20	3	1	1	3	1
PZ-17RR	OC-SW-PZ-17RR-XXX	12/17/2012	480-30497-4	77	71	2	20	3	1	1	3	1

Sample Location	Field Sample ID	Date Sampled	TestAmerica Sample ID	A2340 Hardness	E353.2 Nitrate Nitrite	SW9045C pH	SW9060/ A5310D TOC	A2540D TSS	E160.3 Percent Solid	A2580B ORP	LC65	SW8315
Sediment												
EDSD/SW7	OC-SD-EDSD/SW7-XXX	11/6/2012	480-27939-1		2		1		2		1	2
SD-503	OC-SD-SD-503-XXX	12/17/2012	480-30406-1			1	1		2	1		
SD-504	OC-SD-SD-504-XXX	12/17/2012	480-30406-2			1	1		2	1		
SD-501	OC-SD-SD-501-XXX	12/17/2012	480-30406-3			1	1		2	1		
SD-502	OC-SD-SD-502-XXX	12/17/2012	480-30406-4			1	1		2	1		
Surface Water												
EDSD/SW7	OC-SW-EDSD/SW7-XXX	11/6/2012	480-27937-1	1	2		1	1				
SD-501	OC-SW-SD-501-XXX	12/17/2012	480-30497-1	1	2		1	1		1		
SD-503	OC-SW-SD-503-XXX	12/17/2012	480-30497-2	1	2		1	1		1		
SD-1	OC-SW-SD-1-XXX	12/17/2012	480-30497-3	1	2		1	1		1		
PZ-17RR	OC-SW-PZ-17RR-XXX	12/17/2012	480-30497-4	1	2		1	1		1		

Sample Location	Field Sample ID	Date Sampled	Lancaster Sample ID	SW8000B Opex / Kempore	SW8315A MOD Hydrazine	Katahdin Sample ID	SW8033M DMF
Sediment							
EDSD/SW7	OC-SD-EDSD/SW7-XXX	11/6/2012	6854332		3	SF7934-1	1
Surface Water							
EDSD/SW7	OC-SW-EDSD/SW7-XXX	11/6/2012	6854322	2			

Notes:
Number listed under method indicates the number of target analytes reported.

Prepared by / Date: KJC 03/15/13
Checked by / Date: TLC 03/08/13

Table 2 - Surface Water Results - Volatile Organics
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		PZ-17RR		SD-1		SD-501		SD-503	
			Field Sample ID	OC-SW-EDSD/SW7-XXX		OC-SW-PZ-17RR-XXX		OC-SW-SD-1-XXX		OC-SW-SD-501-XXX		OC-SW-SD-503-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27937-1		480-30497-1		480-30497-1		480-30497-1		480-30497-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8260C	1,1,1,2-Tetrachloroethane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,1,1-Trichloroethane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,1,2,2-Tetrachloroethane	ug/l	0.5	U	0.5	U	0.5	U	1	U	1	U
N	SW8260C	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1.3		1	U	1	U	2	U	2	U
N	SW8260C	1,1,2-Trichloroethane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,1-Dichloroethane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,1-Dichloroethene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,1-Dichloropropene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,2,3-Trichlorobenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,2,3-Trichloropropane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,2,4-Trichlorobenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,2,4-Trimethylbenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,2-Dibromo-3-chloropropane	ug/l	5	U	5	U	5	U	10	U	10	U
N	SW8260C	1,2-Dibromoethane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,2-Dichlorobenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,2-Dichloroethane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,2-Dichloropropane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,3,5-Trimethylbenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,3-Dichlorobenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,3-Dichloropropane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,4-Dichlorobenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	1,4-Dioxane	ug/l	50	UJ	R		R		R		R	
N	SW8260C	2,2-Dichloropropane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	2,4,4-Trimethyl-1-pentene	ug/l	1	U	1.4		1	U	2	U	2	U
N	SW8260C	2,4,4-Trimethyl-2-pentene	ug/l	1	UJ	1	U	1	U	2	U	2	U
N	SW8260C	2-Butanone	ug/l	10	U	7.1	J	25	J	20	U	20	U
N	SW8260C	2-Chlorotoluene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	2-Hexanone	ug/l	10	U	10	U	10	U	20	U	20	U
N	SW8260C	4-Chlorotoluene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	4-iso-Propyltoluene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	4-Methyl-2-pentanone	ug/l	10	U	10	U	10	U	20	U	20	U
N	SW8260C	Acetic acid, methyl ester	ug/l	20	U	20	U	20	U	40	U	40	U

Table 2 - Surface Water Results - Volatile Organics
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		PZ-17RR		SD-1		SD-501		SD-503	
			Field Sample ID	OC-SW-EDSD/SW7-XXX		OC-SW-PZ-17RR-XXX		OC-SW-SD-1-XXX		OC-SW-SD-501-XXX		OC-SW-SD-503-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27937-1		480-30497-1		480-30497-1		480-30497-1		480-30497-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8260C	Acetone	ug/l	3.9	J	8.4	J	12	J	100	U	100	U
N	SW8260C	Benzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Bromobenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Bromochloromethane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Bromodichloromethane	ug/l	0.5	U	0.5	U	0.5	U	1	U	1	U
N	SW8260C	Bromoform	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Bromomethane	ug/l	2	U	2	U	2	U	4	U	4	U
N	SW8260C	Butane, 2-methoxy-2-methyl-	ug/l	5	U	5	U	5	U	10	U	10	U
N	SW8260C	Carbon disulfide	ug/l	10	U	10	U	10	U	20	U	20	U
N	SW8260C	Carbon tetrachloride	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Chlorobenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Chlorodibromomethane	ug/l	0.5	U	0.5	U	0.5	U	1	U	1	U
N	SW8260C	Chloroethane	ug/l	2	U	2	U	2	U	4	U	4	U
N	SW8260C	Chloroform	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Chloromethane	ug/l	2	U	2	U	2	U	4	U	4	U
N	SW8260C	Cis-1,2-Dichloroethene	ug/l	3.1		1	U	1	U	2	U	2	U
N	SW8260C	cis-1,3-Dichloropropene	ug/l	0.4	U	0.4	U	0.4	U	0.8	U	0.8	U
N	SW8260C	Cyclohexane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Dibromomethane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Dichlorodifluoromethane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Diethyl ether	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Ethyl benzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Ethyl-t-Butyl Ether	ug/l	5	U	5	U	5	U	10	U	10	U
N	SW8260C	Hexachlorobutadiene	ug/l	0.4	UJ	0.4	U	0.4	U	0.8	U	0.8	U
N	SW8260C	Isopropyl ether	ug/l	10	U	10	U	10	U	20	U	20	U
N	SW8260C	Isopropylbenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Methyl cyclohexane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Methyl Tertbutyl Ether	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Methylene chloride	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	n-Butylbenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Naphthalene	ug/l	5	U	5	U	5	U	10	U	10	U
N	SW8260C	Propylbenzene	ug/l	1	U	1	U	1	U	2	U	2	U

Table 2 - Surface Water Results - Volatile Organics
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		PZ-17RR		SD-1		SD-501		SD-503	
			Field Sample ID	OC-SW-EDSD/SW7-XXX		OC-SW-PZ-17RR-XXX		OC-SW-SD-1-XXX		OC-SW-SD-501-XXX		OC-SW-SD-503-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27937-1		480-30497-1		480-30497-1		480-30497-1		480-30497-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8260C	sec-Butylbenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Styrene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	tert-Butylbenzene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Tetrachloroethene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Tetrahydrofuran	ug/l	10	U	10	U	10	U	20	U	20	U
N	SW8260C	Toluene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	trans-1,2-Dichloroethene	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	trans-1,3-Dichloropropene	ug/l	0.4	U	0.4	U	0.4	U	0.8	U	0.8	U
N	SW8260C	Trichloroethene	ug/l	2.1	U	1	U	1	U	2	U	2	U
N	SW8260C	Trichlorofluoromethane	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Vinyl chloride	ug/l	0.5	U	0.5	U	0.5	U	1	U	1	U
N	SW8260C	Xylene, o	ug/l	1	U	1	U	1	U	2	U	2	U
N	SW8260C	Xylenes (m&p)	ug/l	2	U	2	U	2	U	4	U	4	U

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

R = value is rejected

J = value is estimated

ug/l = microgram per liter

Prepared by / Date: KJC 03/06/13

Checked by / Date: JAR 03/07/13

Table 2 - Sediment Results - Volatile Organics
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		SD-501		SD-502		SD-503		SD-504	
			Field Sample ID	OC-SD-EDSD/SW7-XXX		OC-SD-SD-501-XXX		OC-SD-SD-502-XXX		OC-SD-SD-503-XXX		OC-SD-SD-504-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27939-1		480-30406-1		480-30406-1		480-30406-1		480-30406-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8260C	1,1,1,2-Tetrachloroethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,1,1-Trichloroethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,1,2,2-Tetrachloroethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/kg	4.1		2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,1,2-Trichloroethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,1-Dichloroethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,1-Dichloroethene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,1-Dichloropropene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,2,3-Trichlorobenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,2,3-Trichloropropane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,2,4-Trichlorobenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,2,4-Trimethylbenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,2-Dibromo-3-chloropropane	ug/kg	29	U	25	U	29	U	34	U	38	U
N	SW8260C	1,2-Dibromoethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,2-Dichlorobenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,2-Dichloroethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,2-Dichloropropane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,3,5-Trimethylbenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,3-Dichlorobenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,3-Dichloropropane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,4-Dichlorobenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	1,4-Dioxane	ug/kg	290	UJ	250	UJ	290	UJ	340	UJ	380	UJ
N	SW8260C	2,2-Dichloropropane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	2,4,4-Trimethyl-1-pentene	ug/kg	5.8	U	5.1	U	11		2.4	J	7.8	
N	SW8260C	2,4,4-Trimethyl-2-pentene	ug/kg	1.6	J	5.1	U	8.8		1.4	J	3.9	J
N	SW8260C	2-Butanone	ug/kg	29	U	27		25	J	35		33	J
N	SW8260C	2-Chlorotoluene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	2-Hexanone	ug/kg	29	U	25	U	29	U	34	U	38	U
N	SW8260C	4-Chlorotoluene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	4-iso-Propyltoluene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	4-Methyl-2-pentanone	ug/kg	29	U	25	U	29	U	34	U	38	U
N	SW8260C	Acetic acid, methyl ester	ug/kg	58	U	51	U	58	U	68	U	75	U

Table 2 - Sediment Results - Volatile Organics
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Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		SD-501		SD-502		SD-503		SD-504	
			Field Sample ID	OC-SD-EDSD/SW7-XXX		OC-SD-SD-501-XXX		OC-SD-SD-502-XXX		OC-SD-SD-503-XXX		OC-SD-SD-504-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27939-1		480-30406-1		480-30406-1		480-30406-1		480-30406-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8260C	Acetone	ug/kg	290	U	120	J	110	J	150	J	130	J
N	SW8260C	Benzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Bromobenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Bromochloromethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Bromodichloromethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Bromoform	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Bromomethane	ug/kg	5.8	U	5.1	UJ	5.8	UJ	6.8	UJ	7.5	UJ
N	SW8260C	Butane, 2-methoxy-2-methyl-	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Carbon disulfide	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Carbon tetrachloride	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Chlorobenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Chlorodibromomethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Chloroethane	ug/kg	5.8	U	5.1	U	5.8	U	6.8	U	7.5	U
N	SW8260C	Chloroform	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Chloromethane	ug/kg	5.8	U	5.1	U	5.8	U	6.8	U	7.5	U
N	SW8260C	Cis-1,2-Dichloroethene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	cis-1,3-Dichloropropene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Cyclohexane	ug/kg	29	U	25	U	29	U	34	U	38	U
N	SW8260C	Dibromomethane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Dichlorodifluoromethane	ug/kg	5.8	U	5.1	U	5.8	U	6.8	U	7.5	U
N	SW8260C	Diethyl ether	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Ethyl benzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Ethyl-t-Butyl Ether	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Hexachlorobutadiene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Isopropyl ether	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Isopropylbenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Methyl cyclohexane	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Methyl Tertbutyl Ether	ug/kg	2.9	U	1.7	J	2.9	U	3.4	U	3.8	U
N	SW8260C	Methylene chloride	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	n-Butylbenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Naphthalene	ug/kg	29	U	25	U	29	U	34	U	38	U
N	SW8260C	Propylbenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U

Table 2 - Sediment Results - Volatile Organics
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		SD-501		SD-502		SD-503		SD-504	
			Field Sample ID	OC-SD-EDSD/SW7-XXX		OC-SD-SD-501-XXX		OC-SD-SD-502-XXX		OC-SD-SD-503-XXX		OC-SD-SD-504-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27939-1		480-30406-1		480-30406-1		480-30406-1		480-30406-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8260C	sec-Butylbenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Styrene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	tert-Butylbenzene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Tetrachloroethene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Tetrahydrofuran	ug/kg	58	U	51	U	58	U	68	U	75	U
N	SW8260C	Toluene	ug/kg	2.9	U	0.98	J	2.9	U	3.4	U	3.8	U
N	SW8260C	trans-1,2-Dichloroethene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	trans-1,3-Dichloropropene	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Trichloroethene	ug/kg	1.7	J	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Trichlorofluoromethane	ug/kg	5.8	U	5.1	U	5.8	U	6.8	U	7.5	U
N	SW8260C	Vinyl chloride	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Xylene, o	ug/kg	2.9	U	2.5	U	2.9	U	3.4	U	3.8	U
N	SW8260C	Xylenes (m&p)	ug/kg	5.8	U	5.1	U	5.8	U	6.8	U	7.5	U

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/kg = microgram per kilogram

Prepared by / Date: KJC 03/06/13

Checked by / Date: JAR 03/07/13

Table 2 - Surface Water Results - Semivolatile Organics
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		PZ-17RR		SD-1		SD-501		SD-503	
			Field Sample ID	OC-SW-EDSD/SW7-XXX		OC-SW-PZ-17RR-XXX		OC-SW-SD-1-XXX		OC-SW-SD-501-XXX		OC-SW-SD-503-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27937-1		480-30497-1		480-30497-1		480-30497-1		480-30497-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	1,2,4,5-Tetrachlorobenzene	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	1-Methylnaphthalene	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	2,3,4,6-Tetrachlorophenol	ug/l	4.9	U	0.96	UJ	0.99	UJ	0.95	UJ	0.95	UJ
N	SW8270	2,4,5-Trichlorophenol	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	2,4,6-Trichlorophenol	ug/l	4.9	U	0.96	UJ	0.99	UJ	0.95	UJ	0.95	UJ
N	SW8270	2,4-Dichlorophenol	ug/l	4.9	U	0.96	UJ	0.99	UJ	0.95	UJ	0.95	UJ
N	SW8270	2,4-Dimethylphenol	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	2,4-Dinitrophenol	ug/l	4.9	UJ	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	2,4-Dinitrotoluene	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	2,6-Dinitrotoluene	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	2-Chloronaphthalene	ug/l	4.9	UJ	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	2-Chlorophenol	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	2-Methylnaphthalene	ug/l	0.97	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	2-Methylphenol	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	2-Nitroaniline	ug/l	4.9	U	4.8	U	5	U	4.8	U	4.8	U
N	SW8270	2-Nitrophenol	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	3 & 4 Methylphenol	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	3,3'-Dichlorobenzidine	ug/l	4.9	U	1.9	U	2	U	1.9	U	1.9	U
N	SW8270	3-Nitroaniline	ug/l	4.9	U	4.8	U	5	U	4.8	U	4.8	U
N	SW8270	4,6-Dinitro-2-methylphenol	ug/l	4.9	U	4.8	U	5	U	4.8	U	4.8	U
N	SW8270	4-Bromophenyl phenyl ether	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	4-Chloro-3-methylphenol	ug/l	4.9	U	1.9	U	2	U	1.9	U	1.9	U
N	SW8270	4-Chloroaniline	ug/l	4.9	U	1.9	U	2	U	1.9	U	1.9	U
N	SW8270	4-Chlorophenyl phenyl ether	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	4-Nitroaniline	ug/l	4.9	U	4.8	U	5	U	4.8	U	4.8	U
N	SW8270	4-Nitrophenol	ug/l		R	4.8	UJ	5	UJ	4.8	UJ	4.8	UJ
N	SW8270	Acenaphthene	ug/l	0.97	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Acenaphthylene	ug/l	0.29	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Acetophenone	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Aniline	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Anthracene	ug/l	0.97	U	0.96	U	0.99	U	0.95	U	0.95	U

Table 2 - Surface Water Results - Semivolatile Organics
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Olin Chemical Superfund Site
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			Loc Name	EDSD/SW7		PZ-17RR		SD-1		SD-501		SD-503	
			Field Sample ID	OC-SW-EDSD/SW7-XXX		OC-SW-PZ-17RR-XXX		OC-SW-SD-1-XXX		OC-SW-SD-501-XXX		OC-SW-SD-503-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27937-1		480-30497-1		480-30497-1		480-30497-1		480-30497-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	Atrazine	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Azobenzene	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Benzaldehyde	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Benzo(a)anthracene	ug/l	0.29	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Benzo(a)pyrene	ug/l	0.19	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Benzo(b)fluoranthene	ug/l	0.29	U	0.96	UJ	0.99	UJ	0.95	UJ	0.95	UJ
N	SW8270	Benzo(ghi)perylene	ug/l	0.49	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Benzo(k)fluoranthene	ug/l	0.29	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Benzoic Acid	ug/l		R		R		R		R		R
N	SW8270	Benzyl alcohol	ug/l	9.7	U	1.9	U	2	U	1.9	U	1.9	U
N	SW8270	Biphenyl	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Bis(2-Chloroethoxy)methane	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Bis(2-Chloroethyl)ether	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Bis(2-Chloroisopropyl)ether	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Bis(2-Ethylhexyl)phthalate	ug/l	1.9	U	4.8	U	5	U	4.8	U	4.8	U
N	SW8270	Butylbenzylphthalate	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Caprolactam	ug/l	4.9	UJ	0.96	UJ	0.99	UJ	0.95	UJ	0.95	UJ
N	SW8270	Carbazole	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Chrysene	ug/l	0.97	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Di-n-butylphthalate	ug/l	4.9	U	4.8	U	5	U	4.8	U	4.8	U
N	SW8270	Di-n-octylphthalate	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Dibenz(a,h)anthracene	ug/l	0.49	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Dibenzofuran	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Diethylphthalate	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Dimethylphthalate	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Diphenyl ether	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Diphenylmethanone (Benzophenone)	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Fluoranthene	ug/l	0.97	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Fluorene	ug/l	0.97	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Hexachlorobenzene	ug/l	0.97	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Hexachlorocyclopentadiene	ug/l	4.9	UJ	1.9	U	2	U	1.9	U	1.9	U
N	SW8270	Hexachloroethane	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Indeno(1,2,3-cd)pyrene	ug/l	0.49	U	0.96	U	0.99	U	0.95	U	0.95	U

Table 2 - Surface Water Results - Semivolatile Organics
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		PZ-17RR		SD-1		SD-501		SD-503	
			Field Sample ID	OC-SW-EDSD/SW7-XXX		OC-SW-PZ-17RR-XXX		OC-SW-SD-1-XXX		OC-SW-SD-501-XXX		OC-SW-SD-503-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27937-1		480-30497-1		480-30497-1		480-30497-1		480-30497-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	Isophorone	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	N-Nitrosodiphenylamine	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Nitrobenzene	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Pentachlorophenol	ug/l	0.97	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Phenanthrene	ug/l	0.39	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Phenol	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U
N	SW8270	Pyrene	ug/l	4.9	U	0.96	U	0.99	U	0.95	U	0.95	U

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

R = value is rejected

ug/l = microgram per liter

Prepared by / Date: KJC 03/15/13

Checked by / Date: JAR 03/14/13

Table 2 - Sediment Results - Semivolatile Organics
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		SD-501		SD-502		SD-503		SD-504	
			Field Sample ID	OC-SD-EDSD/SW7-XXX		OC-SD-SD-501-XXX		OC-SD-SD-502-XXX		OC-SD-SD-503-XXX		OC-SD-SD-504-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27939-1		480-30406-1		480-30406-1		480-30406-1		480-30406-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	1,2,4,5-Tetrachlorobenzene	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	1-Methylnaphthalene	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2,3,4,6-Tetrachlorophenol	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2,4,5-Trichlorophenol	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2,4,6-Trichlorophenol	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2,4-Dichlorophenol	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2,4-Dimethylphenol	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2,4-Dinitrophenol	ug/kg		R	460	UJ	480	UJ	520	UJ	580	UJ
N	SW8270	2,4-Dinitrotoluene	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2,6-Dinitrotoluene	ug/kg	42	UJ	460	U	480	U	520	U	580	U
N	SW8270	2-Chloronaphthalene	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2-Chlorophenol	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2-Methylnaphthalene	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2-Methylphenol	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	2-Nitroaniline	ug/kg	210	U	2300	U	2400	U	2600	U	2900	U
N	SW8270	2-Nitrophenol	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	3 & 4 Methylphenol	ug/kg	42	U	4300		6100		4000		1800	
N	SW8270	3,3'-Dichlorobenzidine	ug/kg	85	U	910	U	950	U	1000	U	1200	U
N	SW8270	3-Nitroaniline	ug/kg	210	U	2300	U	2400	U	2600	U	2900	U
N	SW8270	4,6-Dinitro-2-methylphenol	ug/kg		R	2300	U	2400	U	2600	U	2900	U
N	SW8270	4-Bromophenyl phenyl ether	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	4-Chloro-3-methylphenol	ug/kg	85	U	910	U	950	U	1000	U	1200	U
N	SW8270	4-Chloroaniline	ug/kg	85	U	910	U	950	U	1000	U	1200	U
N	SW8270	4-Chlorophenyl phenyl ether	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	4-Nitroaniline	ug/kg	210	U	2300	U	2400	U	2600	U	2900	U
N	SW8270	4-Nitrophenol	ug/kg		R	2300	UJ	2400	UJ	2600	UJ	2900	UJ
N	SW8270	Acenaphthene	ug/kg	19	J	460	U	480	U	520	U	580	U
N	SW8270	Acenaphthylene	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Acetophenone	ug/kg	42	U	150	J	260	J	160	J	580	U
N	SW8270	Aniline	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Anthracene	ug/kg	40	J	460	U	480	U	520	U	580	U
N	SW8270	Atrazine	ug/kg	42	U	460	U	480	U	520	U	580	U

Table 2 - Sediment Results - Semivolatile Organics
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		SD-501		SD-502		SD-503		SD-504	
			Field Sample ID	OC-SD-EDSD/SW7-XXX		OC-SD-SD-501-XXX		OC-SD-SD-502-XXX		OC-SD-SD-503-XXX		OC-SD-SD-504-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27939-1		480-30406-1		480-30406-1		480-30406-1		480-30406-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	Azobenzene	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Benzaldehyde	ug/kg	42	U	1400		1900		1300		620	
N	SW8270	Benzo(a)anthracene	ug/kg	250		460	U	480	U	520	U	580	U
N	SW8270	Benzo(a)pyrene	ug/kg	240		460	U	480	U	520	U	220	J
N	SW8270	Benzo(b)fluoranthene	ug/kg	430		460	U	140	J	520	U	580	U
N	SW8270	Benzo(ghi)perylene	ug/kg	110		460	U	480	U	520	U	580	U
N	SW8270	Benzo(k)fluoranthene	ug/kg	170		460	U	480	U	520	U	580	U
N	SW8270	Benzoic Acid	ug/kg	160	J	2300	U	2400	U	2600	U	2900	U
N	SW8270	Benzyl alcohol	ug/kg	85	UJ	910	U	950	U	1000	U	1200	U
N	SW8270	Biphenyl	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Bis(2-Chloroethoxy)methane	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Bis(2-Chloroethyl)ether	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Bis(2-Chloroisopropyl)ether	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Bis(2-Ethylhexyl)phthalate	ug/kg	960	J	2300	U	2400	U	3100		2900	U
N	SW8270	Butylbenzylphthalate	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Caprolactam	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Carbazole	ug/kg	63		460	U	480	U	520	U	580	U
N	SW8270	Chrysene	ug/kg	380		460	U	480	U	520	U	580	U
N	SW8270	Di-n-butylphthalate	ug/kg	210	U	2300	U	2400	U	2600	U	2900	U
N	SW8270	Di-n-octylphthalate	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Dibenz(a,h)anthracene	ug/kg	37	J	460	U	480	U	520	U	580	U
N	SW8270	Dibenzofuran	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Diethylphthalate	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Dimethylphthalate	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Diphenyl ether	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Diphenylamine	ug/kg	42	U	--		--		--		--	
N	SW8270	Diphenylmethanone (Benzophenone)	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Fluoranthene	ug/kg	640		210	J	290	J	520	U	580	U
N	SW8270	Fluorene	ug/kg	20	J	460	U	480	U	520	U	580	U
N	SW8270	Hexachlorobenzene	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Hexachlorocyclopentadiene	ug/kg	85	U	910	U	950	U	1000	U	1200	U
N	SW8270	Hexachloroethane	ug/kg	42	U	460	U	480	U	520	U	580	U

Table 2 - Sediment Results - Semivolatile Organics
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		SD-501		SD-502		SD-503		SD-504	
			Field Sample ID	OC-SD-EDSD/SW7-XXX		OC-SD-SD-501-XXX		OC-SD-SD-502-XXX		OC-SD-SD-503-XXX		OC-SD-SD-504-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27939-1		480-30406-1		480-30406-1		480-30406-1		480-30406-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	Indeno(1,2,3-cd)pyrene	ug/kg	110		460	U	480	U	520	U	580	U
N	SW8270	Isophorone	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	N-Nitrosodi-n-propylamine	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	N-Nitrosodiphenylamine	ug/kg	42	UJ	460	U	480	U	330	J	580	U
N	SW8270	Nitrobenzene	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Pentachlorophenol	ug/kg	42	U	460	U	480	U	520	U	580	U
N	SW8270	Phenanthrene	ug/kg	310		460	U	210	J	520	U	580	U
N	SW8270	Phenol	ug/kg	26	J	1700		2200		1900		1400	
N	SW8270	Pyrene	ug/kg	430		180	J	230	J	520	U	580	U

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/kg = microgram per kilogram

-- = analyte not requested for this sample

Prepared by / Date: KJC 03/15/13

Checked by / Date: JAR 03/14/13

Table 2 - Surface Water Results - NDMA
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		PZ-17RR		SD-1		SD-501		SD-503	
			Field Sample ID	OC-SW-EDSD/SW7-XXX		OC-SW-PZ-17RR-XXX		OC-SW-SD-1-XXX		OC-SW-SD-501-XXX		OC-SW-SD-503-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27937-1		480-30497-1		480-30497-1		480-30497-1		480-30497-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	TANDMA	N-Nitrosodi-n-propylamine	ng/l	1.9	U	9.3		4.9		1.9	U	7.4	
N	TANDMA	N-Nitrosodimethylamine	ng/l	1.9	UJ	45	J	24	J	1.9	UJ	3.2	J

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ng/l = nanogram per liter

Prepared by / Date: KJC 03/06/13

Checked by / Date: TLC 03/08/13

Table 2 - Sediment Results - NDMA
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		SD-501		SD-502		SD-503		SD-504	
			Field Sample ID	OC-SD-EDSD/SW7-XXX		OC-SD-SD-501-XXX		OC-SD-SD-502-XXX		OC-SD-SD-503-XXX		OC-SD-SD-504-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27939-1		480-30406-1		480-30406-1		480-30406-1		480-30406-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	TANDMA	N-Nitrosodimethylamine	ug/kg	42	UJ	6.9	UJ	7	UJ	7.6	UJ	9.1	UJ

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/kg = microgram per kilogram

Prepared by / Date: KJC 03/06/13

Checked by / Date: TLC 03/08/13

Table 2 - Surface Water Results - Metals (including Mercury)
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7	
			Field Sample ID	OC-SW-EDSD/SW7-XXX	
			Field Sample Date	11/06/12	
			QC Code	FS	
			Lab Sample Delivery Group	480-27937-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual
T	SW6010	Aluminum	mg/l	0.2	U
T	SW6010	Antimony	mg/l	0.006	U
T	SW6010	Arsenic	mg/l	0.01	U
T	SW6010	Barium	mg/l	0.036	
T	SW6010	Beryllium	mg/l	0.001	U
T	SW6010	Cadmium	mg/l	0.001	U
T	SW6010	Calcium	mg/l	42	
T	SW6010	Chromium	mg/l	0.0041	J
T	SW6010	Cobalt	mg/l	0.0024	J
T	SW6010	Iron	mg/l	0.79	
T	SW6010	Magnesium	mg/l	6.5	
T	SW6010	Manganese	mg/l	0.66	
T	SW6010	Nickel	mg/l	0.0039	J
T	SW6010	Potassium	mg/l	6.1	
T	SW6010	Selenium	mg/l	0.01	U
T	SW6010	Sodium	mg/l	78	
T	SW6010	Thallium	mg/l	0.01	U
T	SW6010	Tin	mg/l	0.01	UJ
T	SW6010	Vanadium	mg/l	0.01	U
T	SW6010	Zinc	mg/l	0.023	J
T	SW6020	Copper	ug/l	2.9	
T	SW6020	Lead	ug/l	0.5	J
T	SW6020	Silver	ug/l	1	U
T	SW7470A	Mercury	mg/l	0.0002	U

Notes:

T = Total metals

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

Prepared by / Date: KJC 03/06/13

Checked by / Date: TLC 03/08/13

Table 2 - Surface Water Results - Metals (including Mercury)
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	PZ-17RR		SD-1		SD-501		SD-503	
			Field Sample ID	OC-SW-PZ-17RR-XXX		OC-SW-SD-1-XXX		OC-SW-SD-501-XXX		OC-SW-SD-503-XXX	
			Field Sample Date	12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30497-1		480-30497-1		480-30497-1		480-30497-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
T	SW6010	Aluminum	ug/l	3600		1800		210		900	
T	SW6010	Antimony	ug/l	6	U	6	U	6	U	6	U
T	SW6010	Arsenic	ug/l	10	U	10	U	10	U	10	U
T	SW6010	Barium	ug/l	21		13		49		26	
T	SW6010	Beryllium	ug/l	0.56	J	1	U	1	U	1	U
T	SW6010	Cadmium	ug/l	1	U	1	U	1	U	1	U
T	SW6010	Calcium	ug/l	26000		23000		190000		53000	
T	SW6010	Chromium	ug/l	710		290		8.5		6.8	J
T	SW6010	Cobalt	ug/l	13		7.6		1.2	J	4	U
T	SW6010	Iron	ug/l	3700		1500		430		1500	
T	SW6010	Magnesium	ug/l	5100		3300		13000		2400	
T	SW6010	Manganese	ug/l	850		500		700		120	
T	SW6010	Nickel	ug/l	14		9	J	5.3	J	1.4	J
T	SW6010	Potassium	ug/l	1700		1300		7600		4000	
T	SW6010	Selenium	ug/l	10	U	10	U	10	U	10	U
T	SW6010	Sodium	ug/l	88000		52000		68000		18000	
T	SW6010	Thallium	ug/l	10	U	10	U	10	U	10	U
T	SW6010	Tin	ug/l	10	UJ	10	UJ	10	UJ	10	UJ
T	SW6010	Vanadium	ug/l	2.2	J	10	U	10	U	2	J
T	SW6010	Zinc	ug/l	38	J	25	J	40	J	10	J
T	SW6020	Copper	ug/l	9.6	J	4.4	J	1.8	J	2.7	J
T	SW6020	Lead	ug/l	0.56	J	0.43	J	0.9	J	3	J
T	SW6020	Silver	ug/l	1	UJ	0.017	J	0.015	J	0.056	J
T	SW7470A	Mercury	ug/l	0.2	U	0.2	U	0.2	U	0.2	U

Notes:

T = Total metals

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/l = microgram per liter

Prepared by / Date: KJC 03/14/13

Checked by / Date: TLC 03/15/13

Table 2 - Sediment Results - Metals (including Mercury)
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		SD-501		SD-502		SD-503		SD-504	
			Field Sample ID	OC-SD-EDSD/SW7-XXX		OC-SD-SD-501-XXX		OC-SD-SD-502-XXX		OC-SD-SD-503-XXX		OC-SD-SD-504-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27939-1		480-30406-1		480-30406-1		480-30406-1		480-30406-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
T	SW6010	Aluminum	mg/kg	3800	J	6500	J	6500	J	9100	J	7800	J
T	SW6010	Antimony	mg/kg	0.89		0.68	U	0.72	U	0.69	U	0.79	U
T	SW6010	Arsenic	mg/kg	26		6.2		8.1		12		9.4	
T	SW6010	Barium	mg/kg	42	J	45		46		48		51	
T	SW6010	Beryllium	mg/kg	1.6		0.094	J	0.09	J	0.12	J	0.089	J
T	SW6010	Cadmium	mg/kg	3.7		0.21	J	0.26	J	0.55		0.56	
T	SW6010	Calcium	mg/kg	1900		3900		3800		4700		4800	
T	SW6010	Chromium	mg/kg	78	J	19		27		50		33	
T	SW6010	Cobalt	mg/kg	13		4		3.9		4.8		4.5	
T	SW6010	Copper	mg/kg	130	J	21		21		19		25	
T	SW6010	Iron	mg/kg	21000		9500	J	9200	J	12000	J	11000	J
T	SW6010	Lead	mg/kg	140	J	51		50		26		23	
T	SW6010	Magnesium	mg/kg	2000	J	2000		1800		2300		2000	
T	SW6010	Manganese	mg/kg	600		590		440		400		440	
T	SW6010	Nickel	mg/kg	29	J	8.7		8.7		11		9.9	
T	SW6010	Potassium	mg/kg	620	J	790		730		1100		740	
T	SW6010	Selenium	mg/kg	0.66	U	0.7	J	0.72	UJ	0.69	UJ	0.79	UJ
T	SW6010	Silver	mg/kg	0.27	J	0.68	UJ	0.72	UJ	0.69	UJ	0.79	UJ
T	SW6010	Sodium	mg/kg	160		140	J	150	J	110	J	150	J
T	SW6010	Thallium	mg/kg	1.3	U	1.4	U	1.4	U	1.4	U	1.6	U
T	SW6010	Tin	mg/kg	NA		2.1	J	2.2	J	2.2	J	2.3	J
T	SW6010	Vanadium	mg/kg	15		17		16		22		19	
T	SW6010	Zinc	mg/kg	1900		65		65		55		73	
T	SW7471	Mercury	mg/kg	0.026	J	0.07	J	0.057	J	0.075	J	0.062	J

Notes:

T = Total metals

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

mg/kg = milligram per kilogram

NA = not analyzed

Prepared by / Date: KJC 03/14/13

480-30406-1 Checked by / Date: JAR 03/14/13

Table 2 - Surface Water Results - Hexavalent Chromium
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	PZ-17RR		SD-1		SD-501		SD-503	
			Field Sample ID	OC-SW-PZ-17RR-XXX		OC-SW-SD-1-XXX		OC-SW-SD-501-XXX		OC-SW-SD-503-XXX	
			Field Sample Date	12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30497-1		480-30497-1		480-30497-1		480-30497-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
T	SW7196A	Chromium, Hexavalent	mg/l	0.005	U	0.005	U	0.005	U	0.01	

Notes:

T = total

FS = field sample

U = not detected, value is the reporting limit

mg/l = milligram per liter

Prepared by / Date: KJC 03/15/13

Checked by / Date: TLC 03/15/13

Table 2 - Sediment Results - Hexavalent Chromium
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SD-501		SD-502		SD-503		SD-504	
			Field Sample ID	OC-SD-SD-501-XXX		OC-SD-SD-502-XXX		OC-SD-SD-503-XXX		OC-SD-SD-504-XXX	
			Field Sample Date	12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30406-1		480-30406-1		480-30406-1		480-30406-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
T	SW7199	Chromium, Hexavalent	mg/kg	0.21	J	0.27	J	0.31	UJ	0.36	UJ

Notes:

T = total

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

mg/kg = milligram per kilogram

Prepared by / Date: KJC 03/15/13

Checked by / Date: TLC 03/15/13

Table 2 - Surface Water Results - General Chemistry
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		PZ-17RR		SD-1		SD-501		SD-503	
			Field Sample ID	OC-SW-EDSD/SW7-XXX		OC-SW-PZ-17RR-XXX		OC-SW-SD-1-XXX		OC-SW-SD-501-XXX		OC-SW-SD-503-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27937-1		480-30497-1		480-30497-1		480-30497-1		480-30497-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2340	Hardness	mg/l	140		80		80		460		120	
N	A2540D	Total Suspended Solids	mg/l	4	U	19		6		4	U	38	
N	A5310D	Total Organic Carbon	mg/l	4.4		7.6		4.5		11		11	
N	E300	Bromide	mg/l	0.18	J	0.2	U	0.2	U	0.13	J	0.2	U
N	E300	Chloride	mg/l	130		96		64		52		9	
N	E300	Sulfate	mg/l	81		150		110		460		96	
N	E350.1	Nitrogen, as Ammonia	mg/l	9		33		21		28		7.5	
N	E353.2	Nitrate as N	mg/l	1.6		0.62	J	0.96	J	3.6	J	0.084	J
N	E353.2	Nitrite as N	mg/l	0.05	U	0.022	J	0.043	J	0.075	J	0.026	J

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

mg/l = milligram per liter

Prepared by / Date: KJC 03/06/13

Checked by / Date: TLC 03/08/13

Table 2 - Sediment Results - General Chemistry
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7		SD-501		SD-502		SD-503		SD-504	
			Field Sample ID	OC-SD-EDSD/SW7-XXX		OC-SD-SD-501-XXX		OC-SD-SD-502-XXX		OC-SD-SD-503-XXX		OC-SD-SD-504-XXX	
			Field Sample Date	11/06/12		12/17/12		12/17/12		12/17/12		12/17/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-27939-1		480-30406-1		480-30406-1		480-30406-1		480-30406-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mv	--		-31		-32		-32		-31	
N	E160.3	Percent Moisture	percent	24		28		31		36		44	
N	E160.3	Percent Solids	percent	76		72		69		64		56	
N	E300	Chloride	mg/kg	26		24		18		6.3	J	13	
N	E300	Sulfate	mg/kg	71		510		1200		900		1900	
N	E350.1	Nitrogen, as Ammonia	mg/kg	8.5		17		35		14		22	
N	E353.2	Nitrate as N	mg/kg	0.99	U	--		--		--		--	
N	E353.2	Nitrite as N	mg/kg	0.99	U	--		--		--		--	
N	SW9045C	pH	pH units	--		7.32		7.23		6.98		6.99	
N	SW9060	Total Organic Carbon	mg/kg	28		90		80		110		60	

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

mv = millivolts

mg/kg = milligram per kilogram

-- = not analyzed for

Prepared by / Date: KJC 03/06/13

Checked by / Date: TLC 03/08/13

Table 2 - Sediment Results - Formaldehyde and Acetaldehyde
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7	
			Field Sample ID	OC-SD-EDSD/SW7-XXX	
			Field Sample Date	11/06/12	
			QC Code	FS	
			Lab Sample Delivery Group	480-27939-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual
N	SW8315	Acetaldehyde	ug/kg	55	J
N	SW8315	Formaldehyde	ug/kg	1100	J

Notes:

N = normal

FS = field sample

J = value is estimated

ug/kg = microgram per kilogram

Prepared by / Date: KJC 03/06/13

Checked by / Date: TLC 03/08/13

Table 2 - Sediment Results - Phthalic Anhydride
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7	
			Field Sample ID	OC-SD-EDSD/SW7-XXX	
			Field Sample Date	11/06/12	
			QC Code	FS	
			Lab Sample Delivery Group	480-27939-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual
N	LC65	Phthalic Acid/Phthalic anhydride	ug/kg	130	UJ

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/kg = microgram per kilogram

Prepared by / Date: KJC 03/06/13

Checked by / Date: TLC 03/08/13

Table 2 - Sediment Results - Hydrazine
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7	
			Field Sample ID	OC-SD-EDSD/SW7-XXX	
			Field Sample Date	11/06/12	
			QC Code	FS	
			Lab Sample Delivery Group	1348041	
Frac	**Method**	**Analyte**	**Units**	Result	Qual
N	SW8315A MOD	Hydrazine	ng/g	2.6	U
N	SW8315A MOD	Monomethylhydrazine (MMH)	ng/g	6.4	U
N	SW8315A MOD	UDMH	ng/g	6.4	U

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

ng/g = nanogram per gram

Prepared by / Date: KJC 03/06/13

Checked by / Date: TLC 03/08/13

Table 2 - Sediment Results - N,N-Dimethylformamide
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7	
			Field Sample ID	OC-SD-EDSD/SW7-XXX	
			Field Sample Date	11/06/12	
			QC Code	FS	
			Lab Sample Delivery Group	WIL-28	
Frac	**Method**	**Analyte**	**Units**	Result	Qual
N	SW8033M	Dimethylformamide	mg/kg	0.23	U

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

mg/kg = milligram per kilogram

Prepared by / Date: KJC 03/06/13

Checked by / Date: TLC 03/08/13

Table 2 - Surface Water Results - Opex and Kempore
Final Results Summary
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	EDSD/SW7	
			Field Sample ID	OC-SW-EDSD/SW7-XXX	
			Field Sample Date	11/06/12	
			QC Code	FS	
			Lab Sample Delivery Group	1348038	
Frac	**Method**	**Analyte**	**Units**	Result	Qual
N	SW8000B	Kempore (Azodicarbonamide)	ug/l	1000	UJ
N	SW8000B	OPEX	ug/l	100	UJ

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/l = microgram per liter

Prepared by / Date: KJC 03/06/13

Checked by / Date: TLC 03/08/13

Table 3 - Data Validation Action Summary
Volatile Organics
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-27937-1	480-27937-1	SW8260C	OC-SW-EDSD/SW7-XXX	1,4-Dioxane	50	U	50	UJ	ICVRRF, CCVRRF, CCV%D	ug/l
480-27937-1	480-27937-1	SW8260C	OC-SW-EDSD/SW7-XXX	2,4,4-Trimethyl-2-pentene	1	U	1	UJ	CCV%D	ug/l
480-27937-1	480-27937-1	SW8260C	OC-SW-EDSD/SW7-XXX	Hexachlorobutadiene	0.4	U	0.4	UJ	CCV%D	ug/l
480-27937-1	480-27937-1	SW8260C	OC-SW-EDSD/SW7-XXX	Trichloroethene	2.1		2.1	U	BL1	ug/l
480-27939-1	480-27939-1	SW8260C	OC-SD-EDSD/SW7-XXX	1,4-Dioxane	290	U	290	UJ	ICVRRF, CCVRRF	ug/kg
480-30406-1	480-30406-1	SW8260C	OC-SD-SD-503-XXX	1,4-Dioxane	340	U	340	UJ	ICVRRF, CCVRRF	ug/kg
480-30406-1	480-30406-1	SW8260C	OC-SD-SD-503-XXX	Bromomethane	6.8	U *	6.8	UJ	LCS-L	ug/kg
480-30406-1	480-30406-2	SW8260C	OC-SD-SD-504-XXX	1,4-Dioxane	380	U	380	UJ	ICVRRF, CCVRRF	ug/kg
480-30406-1	480-30406-2	SW8260C	OC-SD-SD-504-XXX	Bromomethane	7.5	U *	7.5	UJ	LCS-L	ug/kg
480-30406-1	480-30406-3	SW8260C	OC-SD-SD-501-XXX	1,4-Dioxane	250	U	250	UJ	ICVRRF, CCVRRF	ug/kg
480-30406-1	480-30406-3	SW8260C	OC-SD-SD-501-XXX	Bromomethane	5.1	U *	5.1	UJ	LCS-L	ug/kg
480-30406-1	480-30406-4	SW8260C	OC-SD-SD-502-XXX	1,4-Dioxane	290	U	290	UJ	ICVRRF, CCVRRF	ug/kg
480-30406-1	480-30406-4	SW8260C	OC-SD-SD-502-XXX	Bromomethane	5.8	U *	5.8	UJ	LCS-L	ug/kg
480-30497-1	480-30497-1	SW8260C	OC-SW-SD-501-XXX	1,4-Dioxane	100	U		R	ICVRRF, CCVRRF	ug/l
480-30497-1	480-30497-2	SW8260C	OC-SW-SD-503-XXX	1,4-Dioxane	100	U		R	ICVRRF, CCVRRF	ug/l
480-30497-1	480-30497-3	SW8260C	OC-SW-SD-1-XXX	1,4-Dioxane	50	U		R	ICVRRF, CCVRRF	ug/l
480-30497-1	480-30497-3	SW8260C	OC-SW-SD-1-XXX	2-Butanone	25	*	25	J	LCS-H	ug/l
480-30497-1	480-30497-4	SW8260C	OC-SW-PZ-17RR-XXX	1,4-Dioxane	50	U		R	ICVRRF, CCVRRF	ug/l
480-30497-1	480-30497-4	SW8260C	OC-SW-PZ-17RR-XXX	2-Butanone	7.1	J *	7.1	J	LCS-H	ug/l

Units:
ug/l = microgram per liter
ug/kg = microgram per kilogram

Validation Qualifier:
U = not detected, value is the reporting limit
J = value is estimated
R = value is rejected

Validation Reason Codes:
BL1 = Method Blank Qualifier
CCV%D = Continuing calibration %D
CCVRRF = Continuing calibration RRF
ICVRRF = Initial calibration RRF
LCS-H = LCS recovery high
LCS-L = LCS recovery low

Prepared by / Date: KJC 03/06/13
Checked by / Date: JAR 03/07/13

Table 3 - Data Validation Action Summary
Semivolatile Organics
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	2,4-Dinitrophenol	4.9	U *	4.9	UJ	CCV%D, LCS-L, LCS-RPD	ug/l
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	2-Chloronaphthalene	4.9	U *	4.9	UJ	LCS-RPD	ug/l
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	4-Nitrophenol	4.9	U *		R	LCS-L, LCS-RPD	ug/l
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	Benzaldehyde	0.075	J B	4.9	U	BL1	ug/l
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	Benzoic Acid	4.9	U *		R	LCS-L, LCS-RPD	ug/l
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	Caprolactam	4.9	U *	4.9	UJ	LCS-L	ug/l
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	Hexachlorocyclopentadiene	4.9	U	4.9	UJ	CCV%D	ug/l
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	2,4-Dinitrophenol	42	U *		R	LCS-L	ug/kg
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	2,6-Dinitrotoluene	42	U *	42	UJ	LCS-L	ug/kg
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	4,6-Dinitro-2-methylphenol	210	U		R	LCS-L, LCS-RPD	ug/kg
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	4-Nitrophenol	210	U *		R	LCS-L, LCS-RPD	ug/kg
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	Benzoic Acid	160	J	160	J	LCS-L	ug/kg
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	Benzyl alcohol	85	U	85	UJ	LCS-L	ug/kg
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	N-Nitrosodiphenylamine	42	U	42	UJ	LCS-L	ug/kg
480-30406-1	480-30406-1	SW8270	OC-SD-SD-503-XXX	2,4-Dinitrophenol	520	U *	520	UJ	LCS-RPD	ug/kg
480-30406-1	480-30406-1	SW8270	OC-SD-SD-503-XXX	4-Nitrophenol	2600	U *	2600	UJ	LCS-L, LCS-RPD	ug/kg
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	2,4-Dinitrophenol	580	U *	580	UJ	LCS-RPD	ug/kg
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	4-Nitrophenol	2900	U *	2900	UJ	LCS-L, LCS-RPD	ug/kg
480-30406-1	480-30406-3	SW8270	OC-SD-SD-501-XXX	2,4-Dinitrophenol	460	U *	460	UJ	LCS-RPD	ug/kg
480-30406-1	480-30406-3	SW8270	OC-SD-SD-501-XXX	4-Nitrophenol	2300	U *	2300	UJ	LCS-L, LCS-RPD	ug/kg
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	2,4-Dinitrophenol	480	U *	480	UJ	LCS-RPD	ug/kg
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	4-Nitrophenol	2400	U *	2400	UJ	LCS-L, LCS-RPD	ug/kg
480-30497-1	480-30497-1	SW8270	OC-SW-SD-501-XXX	2,3,4,6-Tetrachlorophenol	0.95	U	0.95	UJ	CCV%D	ug/l
480-30497-1	480-30497-1	SW8270	OC-SW-SD-501-XXX	2,4,6-Trichlorophenol	0.95	U	0.95	UJ	CCV%D	ug/l
480-30497-1	480-30497-1	SW8270	OC-SW-SD-501-XXX	2,4-Dichlorophenol	0.95	U *	0.95	UJ	LCS-RPD	ug/l
480-30497-1	480-30497-1	SW8270	OC-SW-SD-501-XXX	4-Nitrophenol	4.8	U *	4.8	UJ	LCS-L	ug/l
480-30497-1	480-30497-1	SW8270	OC-SW-SD-501-XXX	Benzo(b)fluoranthene	0.95	U *	0.95	UJ	LCS-RPD	ug/l
480-30497-1	480-30497-1	SW8270	OC-SW-SD-501-XXX	Benzoic Acid	4.8	U *		R	LCS-L, LCS-RPD	ug/l
480-30497-1	480-30497-1	SW8270	OC-SW-SD-501-XXX	Caprolactam	0.95	U *	0.95	UJ	LCS-L	ug/l
480-30497-1	480-30497-2	SW8270	OC-SW-SD-503-XXX	2,3,4,6-Tetrachlorophenol	0.95	U	0.95	UJ	CCV%D	ug/l
480-30497-1	480-30497-2	SW8270	OC-SW-SD-503-XXX	2,4,6-Trichlorophenol	0.95	U	0.95	UJ	CCV%D	ug/l
480-30497-1	480-30497-2	SW8270	OC-SW-SD-503-XXX	2,4-Dichlorophenol	0.95	U *	0.95	UJ	LCS-RPD	ug/l
480-30497-1	480-30497-2	SW8270	OC-SW-SD-503-XXX	4-Nitrophenol	4.8	U *	4.8	UJ	LCS-L	ug/l
480-30497-1	480-30497-2	SW8270	OC-SW-SD-503-XXX	Benzo(b)fluoranthene	0.95	U *	0.95	UJ	LCS-RPD	ug/l
480-30497-1	480-30497-2	SW8270	OC-SW-SD-503-XXX	Benzoic Acid	4.8	U *		R	LCS-L, LCS-RPD	ug/l
480-30497-1	480-30497-2	SW8270	OC-SW-SD-503-XXX	Caprolactam	0.95	U *	0.95	UJ	LCS-L	ug/l
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	2,3,4,6-Tetrachlorophenol	0.99	U	0.99	UJ	CCV%D	ug/l
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	2,4,6-Trichlorophenol	0.99	U	0.99	UJ	CCV%D	ug/l
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	2,4-Dichlorophenol	0.99	U *	0.99	UJ	LCS-RPD	ug/l
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	4-Nitrophenol	5	U *	5	UJ	LCS-L	ug/l

Table 3 - Data Validation Action Summary
Semivolatile Organics
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	Benzo(b)fluoranthene	0.99	U *	0.99	UJ	LCS-RPD	ug/l
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	Benzoic Acid	5	U *		R	LCS-L, LCS-RPD	ug/l
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	Caprolactam	0.99	U *	0.99	UJ	LCS-L	ug/l
480-30497-1	480-30497-4	SW8270	OC-SW-PZ-17RR-XXX	2,3,4,6-Tetrachlorophenol	0.96	U	0.96	UJ	CCV%D	ug/l
480-30497-1	480-30497-4	SW8270	OC-SW-PZ-17RR-XXX	2,4,6-Trichlorophenol	0.96	U	0.96	UJ	CCV%D	ug/l
480-30497-1	480-30497-4	SW8270	OC-SW-PZ-17RR-XXX	2,4-Dichlorophenol	0.96	U *	0.96	UJ	LCS-RPD	ug/l
480-30497-1	480-30497-4	SW8270	OC-SW-PZ-17RR-XXX	4-Nitrophenol	4.8	U *	4.8	UJ	LCS-L	ug/l
480-30497-1	480-30497-4	SW8270	OC-SW-PZ-17RR-XXX	Benzo(b)fluoranthene	0.96	U *	0.96	UJ	LCS-RPD	ug/l
480-30497-1	480-30497-4	SW8270	OC-SW-PZ-17RR-XXX	Benzoic Acid	4.8	U *		R	LCS-L, LCS-RPD	ug/l
480-30497-1	480-30497-4	SW8270	OC-SW-PZ-17RR-XXX	Caprolactam	0.96	U *	0.96	UJ	LCS-L	ug/l

Units:
ug/l = microgram per liter
ug/kg = microgram per kilogram

Validation Qualifier:
U = not detected, value is the reporting limit
J = value is estimated
R = value is rejected

Validation Reason Codes:
BL1 = Method Blank Qualifier
CCV%D = Continuing calibration %D
LCS-L = LCS recovery low
LCS-RPD = LCS-LCSD RPD limit exceeded

Prepared by / Date: KJC 03/15/13
Checked by / Date: JAR 03/14/13

Table 3 - Data Validation Action Summary
NDMA
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-27937-1	480-27937-1	TANDMA	OC-SW-EDSD/SW7-XXX	N-Nitrosodimethylamine	1.9	U	1.9	UJ	ICVRSD	ng/l
480-27939-1	480-27939-1	TANDMA	OC-SD-EDSD/SW7-XXX	N-Nitrosodimethylamine	42	U	42	UJ	ICVRRF	ug/kg
480-30406-1	480-30406-1	TANDMA	OC-SD-SD-503-XXX	N-Nitrosodimethylamine	7.6	U	7.6	UJ	ICVRSD	ug/kg
480-30406-1	480-30406-2	TANDMA	OC-SD-SD-504-XXX	N-Nitrosodimethylamine	9.1	U	9.1	UJ	ICVRSD	ug/kg
480-30406-1	480-30406-3	TANDMA	OC-SD-SD-501-XXX	N-Nitrosodimethylamine	6.9	U	6.9	UJ	ICVRSD	ug/kg
480-30406-1	480-30406-4	TANDMA	OC-SD-SD-502-XXX	N-Nitrosodimethylamine	7	U	7	UJ	ICVRSD	ug/kg
480-30497-1	480-30497-1	TANDMA	OC-SW-SD-501-XXX	N-Nitrosodimethylamine	1.9	U	1.9	UJ	ICVRSD	ng/l
480-30497-1	480-30497-2	TANDMA	OC-SW-SD-503-XXX	N-Nitrosodimethylamine	3.2		3.2	J	ICVRSD	ng/l
480-30497-1	480-30497-3	TANDMA	OC-SW-SD-1-XXX	N-Nitrosodimethylamine	24		24	J	ICVRSD	ng/l
480-30497-1	480-30497-4	TANDMA	OC-SW-PZ-17RR-XXX	N-Nitrosodimethylamine	45		45	J	ICVRSD	ng/l

Units:
ng/l = nanogram per liter
ug/kg = microgram per kilogram

Validation Reason Codes:
ICVRRF = Initial calibration RRF
ICVRSD = Initial calibration RSD

Prepared by / Date: KJC 03/06/13
Checked by / Date: TLC 03/08/13

Validation Qualifier:
U = not detected, value is the reporting limit
J = value is estimated

Table 3 - Data Validation Action Summary
Metals (including Mercury)
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-27937-1	480-27937-1	SW6010	OC-SW-EDSD/SW7-XXX	Aluminum	0.14	J	0.2	U	BL1	mg/l
480-27937-1	480-27937-1	SW6010	OC-SW-EDSD/SW7-XXX	Tin	0.01	U^	0.01	UJ	QLS-L	mg/l
480-27939-1	480-27939-1	SW6010	OC-SD-EDSD/SW7-XXX	Aluminum	3800		3800	J	MS-H	mg/kg
480-27939-1	480-27939-1	SW6010	OC-SD-EDSD/SW7-XXX	Barium	42	B	42	J	MS-H	mg/kg
480-27939-1	480-27939-1	SW6010	OC-SD-EDSD/SW7-XXX	Chromium	78		78	J	MS-L	mg/kg
480-27939-1	480-27939-1	SW6010	OC-SD-EDSD/SW7-XXX	Copper	130		130	J	MS-L	mg/kg
480-27939-1	480-27939-1	SW6010	OC-SD-EDSD/SW7-XXX	Lead	140		140	J	MS-L	mg/kg
480-27939-1	480-27939-1	SW6010	OC-SD-EDSD/SW7-XXX	Magnesium	2000	B	2000	J	MS-H	mg/kg
480-27939-1	480-27939-1	SW6010	OC-SD-EDSD/SW7-XXX	Nickel	29		29	J	MS-H	mg/kg
480-27939-1	480-27939-1	SW6010	OC-SD-EDSD/SW7-XXX	Potassium	620		620	J	MS-H	mg/kg
480-27939-1	480-27939-1	SW6010	OC-SD-EDSD/SW7-XXX	Silver	0.27	J ^	0.27	J	QLS-H	mg/kg
480-30406-1	480-30406-3	SW6010	OC-SD-SD-501-XXX	Aluminum	6500		6500	J	MS-H	mg/kg
480-30406-1	480-30406-4	SW6010	OC-SD-SD-502-XXX	Aluminum	6500		6500	J	MS-H	mg/kg
480-30406-1	480-30406-1	SW6010	OC-SD-SD-503-XXX	Aluminum	9100		9100	J	MS-H	mg/kg
480-30406-1	480-30406-2	SW6010	OC-SD-SD-504-XXX	Aluminum	7800		7800	J	MS-H	mg/kg
480-30406-1	480-30406-3	SW6010	OC-SD-SD-501-XXX	Iron	9500	B	9500	J	MS-L	mg/kg
480-30406-1	480-30406-4	SW6010	OC-SD-SD-502-XXX	Iron	9200	B	9200	J	MS-L	mg/kg
480-30406-1	480-30406-1	SW6010	OC-SD-SD-503-XXX	Iron	12000	B	12000	J	MS-L	mg/kg
480-30406-1	480-30406-2	SW6010	OC-SD-SD-504-XXX	Iron	11000	B	11000	J	MS-L	mg/kg
480-30406-1	480-30406-3	SW6010	OC-SD-SD-501-XXX	Selenium	0.7		0.7	J	MS-L	mg/kg
480-30406-1	480-30406-4	SW6010	OC-SD-SD-502-XXX	Selenium	0.72	U	0.72	UJ	MS-L	mg/kg
480-30406-1	480-30406-1	SW6010	OC-SD-SD-503-XXX	Selenium	0.69	U	0.69	UJ	MS-L	mg/kg
480-30406-1	480-30406-2	SW6010	OC-SD-SD-504-XXX	Selenium	0.79	U	0.79	UJ	MS-L	mg/kg
480-30406-1	480-30406-3	SW6010	OC-SD-SD-501-XXX	Silver	0.68	U ^	0.68	UJ	QLS-L	mg/kg
480-30406-1	480-30406-4	SW6010	OC-SD-SD-502-XXX	Silver	0.72	U ^	0.72	UJ	QLS-L	mg/kg
480-30406-1	480-30406-1	SW6010	OC-SD-SD-503-XXX	Silver	0.69	U ^	0.69	UJ	QLS-L	mg/kg
480-30406-1	480-30406-2	SW6010	OC-SD-SD-504-XXX	Silver	0.79	U ^	0.79	UJ	QLS-L	mg/kg
480-30406-1	480-30406-3	SW6010	OC-SD-SD-501-XXX	Tin	2.1	J ^	2.1	J	QLS-L	mg/kg
480-30406-1	480-30406-4	SW6010	OC-SD-SD-502-XXX	Tin	2.2	J ^	2.2	J	QLS-L	mg/kg
480-30406-1	480-30406-1	SW6010	OC-SD-SD-503-XXX	Tin	2.2	J ^	2.2	J	QLS-L	mg/kg
480-30406-1	480-30406-2	SW6010	OC-SD-SD-504-XXX	Tin	2.3	J ^	2.3	J	QLS-L	mg/kg
480-30497-1	480-30497-2	SW6010	OC-SW-SD-503-XXX	Chromium	6.8	^	6.8	J	QLS-H	ug/l
480-30497-1	480-30497-4	SW6020	OC-SW-PZ-17RR-XXX	Copper	9.6	B ^	9.6	J	ICV	ug/l
480-30497-1	480-30497-3	SW6020	OC-SW-SD-1-XXX	Copper	4.4	B ^	4.4	J	ICV	ug/l
480-30497-1	480-30497-1	SW6020	OC-SW-SD-501-XXX	Copper	1.8	B ^	1.8	J	ICV	ug/l
480-30497-1	480-30497-2	SW6020	OC-SW-SD-503-XXX	Copper	2.7	B ^	2.7	J	ICV	ug/l
480-30497-1	480-30497-4	SW6020	OC-SW-PZ-17RR-XXX	Lead	0.56	J	0.56	J	ICV	ug/l
480-30497-1	480-30497-3	SW6020	OC-SW-SD-1-XXX	Lead	0.43	J	0.43	J	ICV	ug/l
480-30497-1	480-30497-1	SW6020	OC-SW-SD-501-XXX	Lead	0.9	J	0.9	J	ICV	ug/l
480-30497-1	480-30497-2	SW6020	OC-SW-SD-503-XXX	Lead	3		3	J	ICV	ug/l

Table 3 - Data Validation Action Summary
Metals (including Mercury)
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-30497-1	480-30497-4	SW6020	OC-SW-PZ-17RR-XXX	Silver	1	U	1	UJ	ICV	ug/l
480-30497-1	480-30497-3	SW6020	OC-SW-SD-1-XXX	Silver	0.017	J	0.017	J	ICV	ug/l
480-30497-1	480-30497-1	SW6020	OC-SW-SD-501-XXX	Silver	0.015	J	0.015	J	ICV	ug/l
480-30497-1	480-30497-2	SW6020	OC-SW-SD-503-XXX	Silver	0.056	J	0.056	J	ICV	ug/l
480-30497-1	480-30497-4	SW6010	OC-SW-PZ-17RR-XXX	Tin	10	U ^	10	UJ	QLS-L	ug/l
480-30497-1	480-30497-3	SW6010	OC-SW-SD-1-XXX	Tin	10	U ^	10	UJ	QLS-L	ug/l
480-30497-1	480-30497-1	SW6010	OC-SW-SD-501-XXX	Tin	10	U ^	10	UJ	QLS-L	ug/l
480-30497-1	480-30497-2	SW6010	OC-SW-SD-503-XXX	Tin	10	U ^	10	UJ	QLS-L	ug/l

Units:
mg/l = milligram per liter
ug/l = microgram per liter
mg/kg = milligram per kilogram

Validation Qualifier:
U = not detected, value is the reporting limit
J = value is estimated

Validation Reason Codes:
BL1 = Method Blank Qualifier
ICV = Initial calibration RRF
LCS-L = LCS recovery low
MS-H = MS and/or MSD recovery high
MS-L = MS and/or MSD recovery low
QLS-H = Quantitation Limit Standard recovery above limits
QLS-L = Quantitation Limit Standard recovery less than limits

Prepared by / Date: KJC 03/14/13
480-30406-1 Checked by / Date: JAR 03/14/13
SW Checked by / Date: TLC 03/08/13

Table 3 - Data Validation Action Summary
Hexavalent Chromium
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-30406-1	480-30406-1	SW7199	OC-SD-SD-503-XXX	Chromium, Hexavalent	0.31	U	0.31	UJ	LCS-L	mg/kg
480-30406-1	480-30406-2	SW7199	OC-SD-SD-504-XXX	Chromium, Hexavalent	0.36	U	0.36	UJ	LCS-L	mg/kg
480-30406-1	480-30406-3	SW7199	OC-SD-SD-501-XXX	Chromium, Hexavalent	0.21	J	0.21	J	LCS-L	mg/kg
480-30406-1	480-30406-4	SW7199	OC-SD-SD-502-XXX	Chromium, Hexavalent	0.27	J	0.27	J	LCS-L	mg/kg

Units:
mg/l = milligram per liter
ug/l = microgram per liter
mg/kg = milligram per kilogram

Validation Qualifier:
U = not detected, value is the reporting limit
J = value is estimated

Validation Reason Codes:
LCS-L = LCS recovery low

Prepared by / Date: KJC 03/06/13
Checked by / Date: TLC 03/08/13

Table 3 - Data Validation Action Summary
General Chemistry
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-27939-1	480-27939-1	E353.2	OC-SD-EDSD/SW7-XXX	Nitrate as N	0.79	J H	0.99	U	BL1	mg/kg
480-30497-1	480-30497-1	E353.2	OC-SW-SD-501-XXX	Nitrate as N	3.6	H	3.6	J	HT	mg/l
480-30497-1	480-30497-1	E353.2	OC-SW-SD-501-XXX	Nitrite as N	0.075	H	0.075	J	HT	mg/l
480-30497-1	480-30497-2	E353.2	OC-SW-SD-503-XXX	Nitrate as N	0.084	H	0.084	J	HT	mg/l
480-30497-1	480-30497-2	E353.2	OC-SW-SD-503-XXX	Nitrite as N	0.026	J H *	0.026	J	HT	mg/l
480-30497-1	480-30497-3	E353.2	OC-SW-SD-1-XXX	Nitrate as N	0.96	H	0.96	J	HT	mg/l
480-30497-1	480-30497-3	E353.2	OC-SW-SD-1-XXX	Nitrite as N	0.043	J H *	0.043	J	HT	mg/l
480-30497-1	480-30497-4	E353.2	OC-SW-PZ-17RR-XXX	Nitrate as N	0.62	H	0.62	J	HT	mg/l
480-30497-1	480-30497-4	E353.2	OC-SW-PZ-17RR-XXX	Nitrite as N	0.022	J H *	0.022	J	HT	mg/l

Units:
mg/l = milligram per liter
mg/kg = milligram per kilogram

Validation Qualifier:
U = not detected, value is the reporting limit
J = value is estimated

Validation Reason Codes:
BL1 = Method Blank Qualifier
HT = Holding time for prep or analysis exceeded

Prepared by / Date: KJC 03/06/13
Checked by / Date: TLC 03/08/13

Table 3 - Data Validation Action Summary
Formaldehyde and Acetaldehyde
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-27939-1	480-27939-1	SW8315	OC-SD-EDSD/SW7-XXX	Acetaldehyde	55	J	55	J	MS-L	ug/kg
480-27939-1	480-27939-1	SW8315	OC-SD-EDSD/SW7-XXX	Formaldehyde	1100		1100	J	MS-L	ug/kg

Units:
ug/kg = microgram per kilogram

Validation Reason Codes:
MS-L = MS and/or MSD recovery low

Prepared by / Date: KJC 03/06/13
Checked by / Date: TLC 03/08/13

Validation Qualifier:
J = value is estimated

Table 3 - Data Validation Action Summary
Phthalic Anhydride
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-27939-1	480-27939-1	LC65	OC-SD-EDSD/SW7-XXX	Phthalic Acid/Phthalic anhydride	130	U	130	UJ	MS-L	ug/kg

Units:
ug/kg = microgram per kilogram

Validation Reason Codes:
MS-L = MS and/or MSD recovery low

Prepared by / Date: KJC 03/06/13
Checked by / Date: TLC 03/08/13

Validation Qualifier:
U = not detected, value is the reporting limit
J = value is estimated

Table 3 - Data Validation Action Summary
Opex and Kempore
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
1348038	6854322	SW8000B	OC-SW-EDSD/SW7-XXX	Kempore (Azodicarbonamide)	1000	U	1000	UJ	HT, CCV	ug/l
1348038	6854322	SW8000B	OC-SW-EDSD/SW7-XXX	OPEX	100	U	100	UJ	HT	ug/l

Units:
ug/l = microgram per liter

Validation Qualifier:
U = not detected, value is the reporting limit
J = value is estimated

Validation Reason Codes:
CCV = Continuing calibration verification recovery outside limit
HT = Holding time for prep or analysis exceeded

Prepared by / Date: KJC 03/06/13
Checked by / Date: TLC 03/08/13

Table 4-1 - Tentatively Identified Compounds
VOCs
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Lab Sample ID	Method	Field Sample ID	Sample Date	CAS #	Analyte	RT	Final Result	Lab Qualifier	Final Qualifier	Units	DF	Analysis Date	Analysis Time
480-27939-1	480-27939-1	SW8260C	OC-SD-EDSD/SW7-XXX	11/6/2012	3891-98-3	Dodecane, 2,6,10-trimethyl-	10.48	7.6	TJN	JN	ug/kg	1	11/10/2012	3:43:00 AM
480-27939-1	480-27939-1	SW8260C	OC-SD-EDSD/SW7-XXX	11/6/2012	17301-28-9	Undecane, 3,6-dimethyl-	12.01	6.2	TJN	JN	ug/kg	1	11/10/2012	3:43:00 AM
480-27939-1	480-27939-1	SW8260C	OC-SD-EDSD/SW7-XXX	11/6/2012	1115-11-3	2-Butenal, 2-methyl-	7.65	6.3	TJN	JN	ug/kg	1	11/10/2012	3:43:00 AM
480-27939-1	480-27939-1	SW8260C	OC-SD-EDSD/SW7-XXX	11/6/2012	19549-87-2	2,4-Dimethyl-1-heptene	7.77	6.6	TJN	JN	ug/kg	1	11/10/2012	3:43:00 AM
480-27939-1	480-27939-1	SW8260C	OC-SD-EDSD/SW7-XXX	11/6/2012	1678-97-3	Cyclohexane, 1,2,3-trimethyl-	7.9	16	TJN	JN	ug/kg	1	11/10/2012	3:43:00 AM
480-27939-1	480-27939-1	SW8260C	OC-SD-EDSD/SW7-XXX	11/6/2012	2198-23-4	4-Nonene	8.04	8.6	TJN	JN	ug/kg	1	11/10/2012	3:43:00 AM
480-27939-1	480-27939-1	SW8260C	OC-SD-EDSD/SW7-XXX	11/6/2012	999-7-5	Octane, 4-chloro-	8.18	10	TJN	JN	ug/kg	1	11/10/2012	3:43:00 AM
480-30406-1	480-30406-1	SW8260C	OC-SD-SD-503-XXX	12/17/2012	119209-20-0	Decane, 5,6-dipropyl-	9.85	120	TJN	JN	ug/kg	1	12/19/2012	5:54:00 PM
480-30406-1	480-30406-2	SW8260C	OC-SD-SD-504-XXX	12/17/2012	15220-85-6	1-Propene, 2-methyl-, tetramer	13.15	21	TJN	JN	ug/kg	1	12/19/2012	6:20:00 PM
480-30406-1	480-30406-2	SW8260C	OC-SD-SD-504-XXX	12/17/2012	4/9/4390	Nonane, 2,2,4,4,6,8,8-heptamethyl-	13.29	11	TJN	JN	ug/kg	1	12/19/2012	6:20:00 PM
480-30406-1	480-30406-2	SW8260C	OC-SD-SD-504-XXX	12/17/2012	15220-85-6	1-Propene, 2-methyl-, tetramer	13.37	11	TJN	JN	ug/kg	1	12/19/2012	6:20:00 PM
480-30406-1	480-30406-3	SW8260C	OC-SD-SD-501-XXX	12/17/2012	473-19-8	Bicyclo[2.2.1]heptane, 2,2,3-trimethyl-	10.03	13	TJN	JN	ug/kg	1	12/19/2012	6:46:00 PM
480-30406-1	480-30406-4	SW8260C	OC-SD-SD-502-XXX	12/17/2012	473-19-8	Bicyclo[2.2.1]heptane, 2,2,3-trimethyl-	10.03	7	TJN	JN	ug/kg	1	12/19/2012	7:11:00 PM

Notes:
ug/kg = microgram per kilogram
J = value is estimated
N = presumptively present
T = Tentatively identified compound, the result is estimated

Prepared by / Date: KJC 02/13/13
November Data Checked by / Date: TLC 03/18/13
December Data Checked by / Date: JAR 03/14/13

Table 4-2 - Tentatively Identified Compounds
SVOCs
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Lab Sample ID	Method	Field Sample ID	Sample Date	CAS #	Analyte	RT	Final Result	Lab Qualifier	Final Qualifier	Units	DF	Analysis Date	Analysis Time
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	11/6/2012	111-6-8	Hexadecanoic acid, butyl ester	14.65	0.74	TJN	JN	ug/l	1	11/19/2012	2:41:00 PM
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	11/6/2012	TIC06	Unknown	15.84	3.1	TJN	JN	ug/l	1	11/19/2012	2:41:00 PM
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	11/6/2012	TIC02	Unknown	4.57	0.7	TJN	JN	ug/l	1	11/19/2012	2:41:00 PM
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	11/6/2012	124-18-5	Decane	6.4	0.61	TJN	JN	ug/l	1	11/19/2012	2:41:00 PM
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	11/6/2012	TIC03	Unknown	7.83	1.5	TJN	JN	ug/l	1	11/19/2012	2:41:00 PM
480-27937-1	480-27937-1	SW8270	OC-SW-EDSD/SW7-XXX	11/6/2012	10/1/3302	Hexanoic acid, 3,5,5-trimethyl-	7.88	0.62	TJN	JN	ug/l	1	11/19/2012	2:41:00 PM
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	11/6/2012	TIC02	Unknown	12.51	210	TJ	JN	ug/kg	1	11/20/2012	11:39:00 PM
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	11/6/2012	TIC03	Unknown	12.57	350	TJ	JN	ug/kg	1	11/20/2012	11:39:00 PM
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	11/6/2012	TIC04	Unknown	12.61	370	TJ	JN	ug/kg	1	11/20/2012	11:39:00 PM
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	11/6/2012	TIC05	Unknown	12.64	320	TJ	JN	ug/kg	1	11/20/2012	11:39:00 PM
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	11/6/2012	TIC06	Unknown	12.68	270	TJ	JN	ug/kg	1	11/20/2012	11:39:00 PM
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	11/6/2012	TIC07	Unknown	12.73	220	TJ	JN	ug/kg	1	11/20/2012	11:39:00 PM
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	11/6/2012	TIC08	Unknown	12.79	510	TJ	JN	ug/kg	1	11/20/2012	11:39:00 PM
480-27939-1	480-27939-1	SW8270	OC-SD-EDSD/SW7-XXX	11/6/2012	TIC09	Unknown	12.84	440	TJ	JN	ug/kg	1	11/20/2012	11:39:00 PM
480-30497-1	480-30497-2	SW8270	OC-SW-SD-503-XXX	12/17/2012	TIC04	Unknown	14.43	1.4	TJN	JN	ug/l	1	12/28/2012	1:34:00 PM
480-30497-1	480-30497-2	SW8270	OC-SW-SD-503-XXX	12/17/2012	TIC09	Unknown	16.99	8.8	TJN	JN	ug/l	1	12/28/2012	1:34:00 PM
480-30497-1	480-30497-2	SW8270	OC-SW-SD-503-XXX	12/17/2012	TIC02	Unknown	4.09	1.6	TJN	JN	ug/l	1	12/28/2012	1:34:00 PM
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	12/17/2012	TIC07	Unknown	16.1	2.6	TJN	JN	ug/l	1	12/28/2012	2:00:00 PM
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	12/17/2012	TIC09	Unknown	17.34	5.2	TJN	JN	ug/l	1	12/28/2012	2:00:00 PM
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	12/17/2012	TIC02	Unknown	8.81	2.7	TJN	JN	ug/l	1	12/28/2012	2:00:00 PM
480-30497-1	480-30497-3	SW8270	OC-SW-SD-1-XXX	12/17/2012	TIC03	Unknown	8.86	5	TJN	JN	ug/l	1	12/28/2012	2:00:00 PM
480-30497-1	480-30497-4	SW8270	OC-SW-PZ-17RR-XXX	12/17/2012	TIC08	Unknown	16.11	2.4	TJN	JN	ug/l	1	12/28/2012	2:26:00 PM
480-30497-1	480-30497-4	SW8270	OC-SW-PZ-17RR-XXX	12/17/2012	TIC02	Unknown	4.39	2.8	TJN	JN	ug/l	1	12/28/2012	2:26:00 PM
480-30497-1	480-30497-4	SW8270	OC-SW-PZ-17RR-XXX	12/17/2012	TIC04	Unknown	8.87	1.5	TJN	JN	ug/l	1	12/28/2012	2:26:00 PM
480-30406-1	480-30406-1	SW8270	OC-SD-SD-503-XXX	12/17/2012	TIC02	Unknown	12.93	1300	TJN	JN	ug/kg	10	12/21/2012	12:20:00 PM
480-30406-1	480-30406-1	SW8270	OC-SD-SD-503-XXX	12/17/2012	TIC03	Unknown	13.78	1100	TJN	JN	ug/kg	10	12/21/2012	12:20:00 PM
480-30406-1	480-30406-1	SW8270	OC-SD-SD-503-XXX	12/17/2012	483-65-8	Phenanthrene, 1-methyl-7-(1-methylethyl)	14.91	1900	TJN	JN	ug/kg	10	12/21/2012	12:20:00 PM
480-30406-1	480-30406-1	SW8270	OC-SD-SD-503-XXX	12/17/2012	TIC04	Unknown	15.07	3100	TJN	JN	ug/kg	10	12/21/2012	12:20:00 PM
480-30406-1	480-30406-1	SW8270	OC-SD-SD-503-XXX	12/17/2012	TIC05	Unknown	15.19	1700	TJN	JN	ug/kg	10	12/21/2012	12:20:00 PM
480-30406-1	480-30406-1	SW8270	OC-SD-SD-503-XXX	12/17/2012	18956-15-5	2-Propen-1-one, 1-(2,6-dihydroxy-4-metho	15.48	1100	TJN	JN	ug/kg	10	12/21/2012	12:20:00 PM
480-30406-1	480-30406-1	SW8270	OC-SD-SD-503-XXX	12/17/2012	TIC06	Unknown	16.07	760	TJN	JN	ug/kg	10	12/21/2012	12:20:00 PM
480-30406-1	480-30406-1	SW8270	OC-SD-SD-503-XXX	12/17/2012	26603-23-6	p,p'-Dioctyldiphenylamine	17.01	31000	TJN	JN	ug/kg	10	12/21/2012	12:20:00 PM
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	12/17/2012	TIC05	Unknown	12.4	610	TJN	JN	ug/kg	10	12/21/2012	12:45:00 PM
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	12/17/2012	TIC06	Unknown	12.94	870	TJN	JN	ug/kg	10	12/21/2012	12:45:00 PM
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	12/17/2012	TIC07	Unknown	13.78	830	TJN	JN	ug/kg	10	12/21/2012	12:45:00 PM
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	12/17/2012	TIC08	Unknown	15.07	700	TJN	JN	ug/kg	10	12/21/2012	12:45:00 PM
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	12/17/2012	TIC09	Unknown	15.21	1300	TJN	JN	ug/kg	10	12/21/2012	12:45:00 PM
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	12/17/2012	TIC01	Unknown	3.18	940	TJN	JN	ug/kg	10	12/21/2012	12:45:00 PM
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	12/17/2012	TIC03	Unknown	4.66	2400	TJN	JN	ug/kg	10	12/21/2012	12:45:00 PM
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	12/17/2012	TIC04	Unknown	5.54	650	TJN	JN	ug/kg	10	12/21/2012	12:45:00 PM
480-30406-1	480-30406-2	SW8270	OC-SD-SD-504-XXX	12/17/2012	289-16-7	1,2,4-Trithiolane	7.61	550	TJN	JN	ug/kg	10	12/21/2012	12:45:00 PM
480-30406-1	480-30406-3	SW8270	OC-SD-SD-501-XXX	12/17/2012	57-10-3	n-Hexadecanoic acid	13.78	1500	TJN	JN	ug/kg	10	12/21/2012	1:11:00 PM
480-30406-1	480-30406-3	SW8270	OC-SD-SD-501-XXX	12/17/2012	TIC03	Unknown	14.47	1300	TJN	JN	ug/kg	10	12/21/2012	1:11:00 PM
480-30406-1	480-30406-3	SW8270	OC-SD-SD-501-XXX	12/17/2012	TIC04	Unknown	15.2	840	TJN	JN	ug/kg	10	12/21/2012	1:11:00 PM

Table 4-2 - Tentatively Identified Compounds
SVOCs
Data Validation Report
OU1 and OU2 November/December 2012 Surface Water and Sediment Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Lab Sample ID	Method	Field Sample ID	Sample Date	CAS #	Analyte	RT	Final Result	Lab Qualifier	Final Qualifier	Units	DF	Analysis Date	Analysis Time
480-30406-1	480-30406-3	SW8270	OC-SD-SD-501-XXX	12/17/2012	TIC05	Unknown	15.49	990	TJN	JN	ug/kg	10	12/21/2012	1:11:00 PM
480-30406-1	480-30406-3	SW8270	OC-SD-SD-501-XXX	12/17/2012	630-3-5	Nonacosane	17.31	900	TJN	JN	ug/kg	10	12/21/2012	1:11:00 PM
480-30406-1	480-30406-3	SW8270	OC-SD-SD-501-XXX	12/17/2012	TIC06	Unknown	18.61	1000	TJN	JN	ug/kg	10	12/21/2012	1:11:00 PM
480-30406-1	480-30406-3	SW8270	OC-SD-SD-501-XXX	12/17/2012	TIC02	Unknown	8.53	620	TJN	JN	ug/kg	10	12/21/2012	1:11:00 PM
480-30406-1	480-30406-3	SW8270	OC-SD-SD-501-XXX	12/17/2012	TIC07	Unknown	9.81	1400	TJN	JN	ug/kg	10	12/21/2012	1:11:00 PM
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	12/17/2012	TIC03	Unknown	10.17	820	TJN	JN	ug/kg	10	12/21/2012	1:37:00 PM
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	12/17/2012	292-46-6	Lenthionine	12.39	1400	TJN	JN	ug/kg	10	12/21/2012	1:37:00 PM
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	12/17/2012	TIC04	Unknown	12.93	1600	TJN	JN	ug/kg	10	12/21/2012	1:37:00 PM
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	12/17/2012	638-53-9	Tridecanoic acid	13.78	2000	TJN	JN	ug/kg	10	12/21/2012	1:37:00 PM
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	12/17/2012	69009-90-1	1,1'-Biphenyl, bis(1-methylethyl)-	14.46	800	TJN	JN	ug/kg	10	12/21/2012	1:37:00 PM
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	12/17/2012	18956-15-5	2-Propen-1-one, 1-(2,6-dihydroxy-4-metho	15.48	960	TJN	JN	ug/kg	10	12/21/2012	1:37:00 PM
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	12/17/2012	TIC01	Unknown	4.09	8900	TJN	JN	ug/kg	10	12/21/2012	1:37:00 PM
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	12/17/2012	1000157-89-9	(+)-.alpha.-Terpineol (p-menth-1-en-8-ol	8.53	820	TJN	JN	ug/kg	10	12/21/2012	1:37:00 PM
480-30406-1	480-30406-4	SW8270	OC-SD-SD-502-XXX	12/17/2012	TIC02	Unknown	9.8	1600	TJN	JN	ug/kg	10	12/21/2012	1:37:00 PM

Notes:
ug/l = microgram per liter
ug/kg = microgram per kilogram
T = Tentatively identified compound, the result is estimated
J = value is estimated
N = presumptively present

Prepared by / Date: KJC 02/13/13
November Data Checked by / Date: TLC 03/18/13
December Data Checked by / Date: JAR 03/14/13

CHECKLISTS

VOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / II / III (circle one)

SITE: Olin Chemical Project #: 6107130016-10 SDG #: 480-27937-1

LAB #: TAL-buffalo

Sample IDs: Attached tracking sheet Sample OC-SW-EDSD/SW7-XXX

This checklist is designed to be used with USEPA Region I Validation Guidelines Part II (12/1996). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO	NA		
Data completeness				
☑	☐	☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑	☐	☐	Data summaries match EDD	
Holding Times and Preservation				
☑	☐	☐	Hold times met (14 days with preservation)	
☑	☐	☐	Preserved (waters HCL, soils methanol)	
Instrument Performance Check (Tune)				
☑	☐	☐	Tune available for each 12-hour period samples were analyzed	
☑	☐	☐	Appropriate number of significant figures reported (at least 2)	
☑	☐	☐	Mass/Charge list (m/z) criteria met	
Initial Calibration				
☑	☐	☐	%RSD less than or equal to 30%	
* ☐	☑	☐	RRF greater than or equal to 0.05	1,4-Dioxane @ 0.0068 Results UJ
Continuing Calibration				
* ☐	☑	☐	%D less than or equal to 25%	1,4-Dioxane 30.8% RRF 0.0089 UJ sample
☑	☐	☐	RRF greater than or equal to 0.05.	Hexachlorobutadiene 26.6% UJ Sample 244TMP-2 26.2% UJ sample
Blank Contamination				
* ☑	☐	☐	Method blank contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.
☐	☐	☑	Trip blank contamination not collected	
☐	☐	☑	Equipment/Rinseate blank contamination	TCE in MB @ 0.462x5 = 2.31 ppb

→ Not submitted

VOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

Yes	No	N/A	TIER I / (II) / III (circle one)	
Surrogate Recoveries				
☑	☐	☐	Surrogates percent recovery criteria met (water and soil: 70%-130%)	
Matrix Spikes and Laboratory Control Samples				
☐	☐	☑	MS/MSD percent recovery criteria met (water and soil: 70%-130%)	not submitted
☐	☐	☑	MS/MSD RPD criteria met (water and soil <30%)	not submitted
☐	☑	☐	LCS percent recovery criteria (water and soil: 70%-130%)	LCS% / LCSD Dichlorodifluoromethane 131% / OK 244TMP-2 155% / 143% no hits no Quals
Field Duplicates				
☐	☐	☑	RPD criteria (water <30%, soils <50%) met	not collected
Internal Standard				
☑	☐	☐	Area counts within -50 to +100 percent of calib. std.	
☑	☐	☐	Retention Time within 30 seconds of calib. std.	
Target Compounds				
☑	☐	☐	Reviewed narrative for anomalies	
Tentatively Identified Compounds (TICs)				
☐	☑	☐	TCL compounds reported as TICs	

Validator's Signature: [signature]

Date: 2/18/13

Reference:

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-27937-1

SDG No.:

Client Sample ID: OC-SW-EDSD/SW7-XXX | Lab Sample ID: 480-27937-1

Matrix: Water | Lab File ID: C24042.D

Analysis Method: 8260C | Date Collected: 11/06/2012 09:30

Sample wt/vol: 5(mL) | Date Analyzed: 11/13/2012 15:10

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624 (30) ID: 0.53(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 90540 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
630-20-6	1,1,1,2-Tetrachloroethane	ND		1.0	0.35
71-55-6	1,1,1-Trichloroethane	ND		1.0	0.82
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.50	0.21
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.3		1.0	0.31
79-00-5	1,1,2-Trichloroethane	ND		1.0	0.23
75-34-3	1,1-Dichloroethane	ND		1.0	0.38
75-35-4	1,1-Dichloroethene	ND		1.0	0.29
563-58-6	1,1-Dichloropropene	ND		1.0	0.72
87-61-6	1,2,3-Trichlorobenzene	ND		1.0	0.41
96-18-4	1,2,3-Trichloropropane	ND		1.0	0.89
120-82-1	1,2,4-Trichlorobenzene	ND		1.0	0.41
95-63-6	1,2,4-Trimethylbenzene	ND		1.0	0.75
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.0	0.39
95-50-1	1,2-Dichlorobenzene	ND		1.0	0.79
107-06-2	1,2-Dichloroethane	ND		1.0	0.21
78-87-5	1,2-Dichloropropane	ND		1.0	0.72
108-67-8	1,3,5-Trimethylbenzene	ND		1.0	0.77
541-73-1	1,3-Dichlorobenzene	ND		1.0	0.78
142-28-9	1,3-Dichloropropane	ND		1.0	0.75
106-46-7	1,4-Dichlorobenzene	ND		1.0	0.84
123-91-1	1,4-Dioxane	ND	UJ	50	9.3
594-20-7	2,2-Dichloropropane	ND		1.0	0.40
107-39-1	2,4,4-Trimethyl-1-pentene	ND		1.0	1.0
107-40-4	2,4,4-Trimethyl-2-pentene	ND	UJ	1.0	0.50
78-93-3	2-Butanone (MEK)	ND		10	1.3
95-49-8	2-Chlorotoluene	ND		1.0	0.86
591-78-6	2-Hexanone	ND		10	1.2
106-43-4	4-Chlorotoluene	ND		1.0	0.84
99-87-6	4-Isopropyltoluene	ND		1.0	0.31
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		10	2.1
67-64-1	Acetone	3.9	J	50	3.0
71-43-2	Benzene	ND		1.0	0.41
108-86-1	Bromobenzene	ND		1.0	0.80
75-25-2	Bromoform	ND		1.0	0.26
74-83-9	Bromomethane	ND		2.0	0.69

TC
2/18/13

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-27937-1

SDG No.:

Client Sample ID: OC-SW-EDSD/SW7-XXX | Lab Sample ID: 480-27937-1

Matrix: Water | Lab File ID: C24042.D

Analysis Method: 8260C | Date Collected: 11/06/2012 09:30

Sample wt/vol: 5(mL) | Date Analyzed: 11/13/2012 15:10

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624 (30) ID: 0.53(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 90540 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-15-0	Carbon disulfide	ND		10	0.19
56-23-5	Carbon tetrachloride	ND		1.0	0.27
108-90-7	Chlorobenzene	ND		1.0	0.75
74-97-5	Chlorobromomethane	ND		1.0	0.87
124-48-1	Chlorodibromomethane	ND		0.50	0.32
75-00-3	Chloroethane	ND		2.0	0.32
67-66-3	Chloroform	ND		1.0	0.34
74-87-3	Chloromethane	ND		2.0	0.35
156-59-2	cis-1,2-Dichloroethene	3.1		1.0	0.81
10061-01-5	cis-1,3-Dichloropropene	ND		0.40	0.36
110-82-7	Cyclohexane	ND		1.0	0.18
74-95-3	Dibromomethane	ND		1.0	0.41
75-27-4	Dichlorobromomethane	ND		0.50	0.39
75-71-8	Dichlorodifluoromethane	ND		1.0	0.68
60-29-7	Ethyl ether	ND		1.0	0.72
100-41-4	Ethylbenzene	ND		1.0	0.74
106-93-4	Ethylene Dibromide	ND		1.0	0.73
87-68-3	Hexachlorobutadiene	ND	UJ	0.40	0.28
108-20-3	Isopropyl ether	ND		10	0.59
98-82-8	Isopropylbenzene	ND		1.0	0.79
79-20-9	Methyl acetate	ND		20	0.50
1634-04-4	Methyl tert-butyl ether	ND		1.0	0.16
108-87-2	Methylcyclohexane	ND		1.0	0.16
75-09-2	Methylene Chloride	ND		1.0	0.44
179601-23-1	m-Xylene & p-Xylene	ND		2.0	0.66
91-20-3	Naphthalene	ND		5.0	0.43
104-51-8	n-Butylbenzene	ND		1.0	0.64
103-65-1	N-Propylbenzene	ND		1.0	0.69
95-47-6	o-Xylene	ND		1.0	0.76
135-98-8	sec-Butylbenzene	ND		1.0	0.75
100-42-5	Styrene	ND		1.0	0.73
994-05-8	Tert-amyl methyl ether	ND		5.0	0.27
637-92-3	Tert-butyl ethyl ether	ND		5.0	0.29
98-06-6	tert-Butylbenzene	ND		1.0	0.81
127-18-4	Tetrachloroethene	ND		1.0	0.36
109-99-9	Tetrahydrofuran	ND		10	1.3

FORM I 8260C

TC
2/18/13

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-27937-1
SDG No.:
Client Sample ID: OC-SW-EDSD/SW7-XXX
Lab Sample ID: 480-27937-1
Matrix: Water
Lab File ID: C24042.D
Analysis Method: 8260C
Date Collected: 11/06/2012 09:30
Sample wt/vol: 5(mL)
Date Analyzed: 11/13/2012 15:10
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: ZB-624 (30) ID: 0.53(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 90540
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
108-88-3	Toluene	ND		1.0	0.51
156-60-5	trans-1,2-Dichloroethene	ND		1.0	0.90
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.37
79-01-6	Trichloroethene	2.1	U	1.0	0.46
75-69-4	Trichlorofluoromethane	ND		1.0	0.88
75-01-4	Vinyl chloride	ND		0.50	0.90

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	95		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	86		70-130
460-00-4	4-Bromofluorobenzene (Surr)	102		70-130

TC 2/18/13

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Client Sample ID: OC-SW-EDSD/SW7-XXX Lab Sample ID: 480-27937-1

Matrix: Water Lab File ID: C24042.D

Analysis Method: 8260C Date Collected: 11/06/2012 09:30

Sample wt/vol: 5(mL) Date Analyzed: 11/13/2012 15:10

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 90540 Units: ug/L

Number TICs Found: 1 TIC Result Total: 2.6

CAS NO.	COMPOUND NAME	RT	RESULT	Q
~~1066-40-6~~	~~Silanol, trimethyl-~~	~~8.38~~	~~2.6~~	~~T J N~~

FORM I-TIC 8260C

TC
2/18/13

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1 Analy Batch No.: 87730

SDG No.:

Instrument ID: HP5973C GC Column: ZB-624 (30) ID: 0.53(mm) Heated Purge: (Y/N) N

Calibration Start Date: 10/27/2012 01:00 Calibration End Date: 10/27/2012 03:07 Calibration ID: 10994

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 480-87730/15	C23458.D
Level 2	IC 480-87730/16	C23459.D
Level 3	IC 480-87730/17	C23460.D
Level 4	IC 480-87730/18	C23461.D
Level 5	IC 480-87730/19	C23462.D
Level 6	IC 480-87730/20	C23463.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Ethyl ether	0.2892 0.3491	0.3182	0.3117	0.3405	0.3180	Ave		0.3211				6.7		15.0			
3-Chloro-1-propene	0.6695 0.6218	0.5924	0.5287	0.5938	0.5398	Ave		0.5910				8.8		15.0			
2-Methyl-2-propanol	0.0453 0.0505	0.0484	0.0492	0.0522	0.0492	Ave		0.0491				4.7		15.0			
Halothane	0.1527 0.1739	0.1536	0.1650	0.1707	0.1726	Ave		0.1647				5.8		15.0			
Isopropyl ether	1.1622 1.2934	1.2515	1.1907	1.2998	1.1915	Ave		1.2315				4.7		15.0			
Tert-butyl ethyl ether	1.0874 1.2130	1.1533	1.1239	1.2320	1.1775	Ave		1.1645				4.7		15.0			
Propionitrile	0.0531 0.0644	0.0606	0.0604	0.0654	0.0621	Ave		0.0610				7.1		15.0			
Tert-amyl methyl ether	0.9131 1.0079	0.9296	0.9045	1.0019	0.9558	Ave		0.9521				4.7		15.0			
n-Heptane	0.5140 0.5567	0.5357	0.4731	0.5447	0.4572	Ave		0.5136				7.9		15.0			
2,4,4-Trimethyl-1-pentene	0.3015 0.1790	0.2782	0.2192	0.2319	0.2111	Lin	0.6828	0.1782							0.9910		0.9900
2,4,4-Trimethyl-2-pentene	0.5831 0.5821	0.5593	0.5853	0.6258	0.5538	Ave		0.5816				4.4		15.0			
1,4-Dioxane	0.0054 0.0072	0.0070	0.0071	0.0073	0.0068	Ave		0.0068				10.0		15.0			
2-Nitropropane	0.1982 0.2886	0.2010	0.2095	0.2463	0.2576	Lin1	-0.876	0.2736							0.9930		0.9900

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Lab Sample ID: CCVIS 480-90540/2 Calibration Date: 11/13/2012 10:32

Instrument ID: HP5973C Calib Start Date: 10/26/2012 19:59

GC Column: ZB-624 (30) ID: 0.53(mm) Calib End Date: 10/26/2012 22:30

Lab File ID: C24032.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Toluene	Ave	1.580	1.670	0.4000	26.4	25.0	5.7	20.0
Ethyl methacrylate	Ave	0.8302	0.8501		25.6	25.0	2.4	20.0
cis-1,3-Dichloropropene	Ave	0.5298	0.5523	0.2000	26.1	25.0	4.2	20.0
1,1,2-Trichloroethane	Ave	0.4805	0.5082	0.1000	26.4	25.0	5.8	20.0
2-Hexanone	Ave	0.6079	0.5372	0.0500	110	125	-11.6	20.0
Tetrachloroethene	Ave	0.6251	0.7561	0.1000	30.2	25.0	21.0*	20.0
1,3-Dichloropropane	Ave	1.031	1.070		25.9	25.0	3.8	20.0
Chlorodibromomethane	Ave	0.6234	0.6967	0.1000	27.9	25.0	11.8	20.0
Ethylene Dibromide	Ave	0.5959	0.6353	0.1000	26.7	25.0	6.6	20.0
Chlorobenzene	Ave	1.725	1.885	0.5000	27.3	25.0	9.3	20.0
Ethylbenzene	Ave	3.034	3.144	0.1000	25.9	25.0	3.6	20.0
1,1,1,2-Tetrachloroethane	Ave	0.6023	0.6661		27.6	25.0	10.6	20.0
m-Xylene & p-Xylene	Ave	1.140	1.236	0.1000	54.2	50.0	8.4	20.0
o-Xylene	Ave	1.108	1.198	0.3000	27.0	25.0	8.1	20.0
Styrene	Ave	1.851	1.914	0.3000	25.9	25.0	3.4	20.0
Isopropylbenzene	Ave	3.150	2.974	0.1000	23.6	25.0	-5.6	20.0
Bromoform	Ave	0.3770	0.4678	0.1000	31.0	25.0	24.1*	20.0
1,1,2,2-Tetrachloroethane	Ave	0.8735	0.8518	0.3000	24.4	25.0	-2.5	20.0
trans-1,4-Dichloro-2-butene	Ave	0.2548	0.1874		91.9	125	-26.5*	20.0
N-Propylbenzene	Ave	3.952	3.732		23.6	25.0	-5.6	20.0
1,2,3-Trichloropropane	Ave	0.2734	0.2634		24.1	25.0	-3.6	20.0
Bromobenzene	Ave	0.8058	0.8057		25.0	25.0	0.0	20.0
1,3,5-Trimethylbenzene	Ave	2.650	2.519		23.8	25.0	-4.9	20.0
2-Chlorotoluene	Ave	0.7592	0.7450		24.5	25.0	-1.9	20.0
4-Chlorotoluene	Ave	0.7862	0.7651		24.3	25.0	-2.7	20.0
tert-Butylbenzene	Ave	0.5520	0.5514		25.0	25.0	-0.1	20.0
1,2,4-Trimethylbenzene	Ave	2.693	2.564		23.8	25.0	-4.8	20.0
sec-Butylbenzene	Ave	3.262	3.174		24.3	25.0	-2.7	20.0
4-Isopropyltoluene	Ave	2.766	2.720		24.6	25.0	-1.7	20.0
1,3-Dichlorobenzene	Ave	1.520	1.501	0.6000	24.7	25.0	-1.2	20.0
1,4-Dichlorobenzene	Ave	1.532	1.522	0.5000	24.8	25.0	-0.7	20.0
n-Butylbenzene	Ave	2.595	2.435		23.5	25.0	-6.2	20.0
1,2-Dichlorobenzene	Ave	1.463	1.437	0.4000	24.5	25.0	-1.8	20.0
1,2-Dibromo-3-Chloropropane	Ave	0.1743	0.1604	0.0500	23.0	25.0	-8.0	20.0
1,2,4-Trichlorobenzene	Ave	1.011	1.100	0.2000	27.2	25.0	8.8	20.0
Hexachlorobutadiene	Ave	0.3821	0.4836		31.6	25.0	26.6*	20.0
Naphthalene	Ave	2.856	2.822		24.7	25.0	-1.2	20.0
1,2,3-Trichlorobenzene	Ave	0.9526	1.044		27.4	25.0	9.6	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2019	0.1731		21.4	25.0	-14.3	20.0
Toluene-d8 (Surr)	Ave	2.044	2.022		24.7	25.0	-1.1	20.0
4-Bromofluorobenzene (Surr)	Ave	0.6394	0.6792		26.6	25.0	6.2	20.0

FORM VII 8260C

2/18/13
TC

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Lab Sample ID: CCV 480-90540/3 Calibration Date: 11/13/2012 11:11

Instrument ID: HP5973C Calib Start Date: 10/27/2012 01:00

GC Column: ZB-624 (30) ID: 0.53(mm) Calib End Date: 10/27/2012 03:07

Lab File ID: C24033.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ethyl ether	Ave	0.3211	0.3648		28.4	25.0	13.6	20.0
3-Chloro-1-propene	Ave	0.5910	0.5871		24.8	25.0	-0.7	20.0
2-Methyl-2-propanol	Ave	0.0491	0.0600		610	500	22.1*	20.0
Halothane	Ave	0.1647	0.1898		28.8	25.0	15.2	20.0
Isopropyl ether	Ave	1.232	1.224		24.8	25.0	-0.6	20.0
Tert-butyl ethyl ether	Ave	1.165	1.221		26.2	25.0	4.9	20.0
Propionitrile	Ave	0.0610	0.0726		297	250	19.0	20.0
Tert-amyl methyl ether	Ave	0.9521	1.066		28.0	25.0	12.0	20.0
n-Heptane	Ave	0.5136	0.5525		26.9	25.0	7.6	20.0
2,4,4-Trimethyl-1-pentene	Lin		0.2334		28.9	25.0	15.6	20.0
2,4,4-Trimethyl-2-pentene	Ave	0.5816	0.7338		31.5	25.0	26.2*	20.0
1,4-Dioxane	Ave	0.0068	0.0089		1310	1000	30.8*	20.0
2-Nitropropane	Lin1		0.2147		101	125	-19.0	20.0

FORM VII 8260C

TC
2/18/13

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-27937-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 480-90540/7
Matrix: Water
Lab File ID: C24037.D
Analysis Method: 8260C
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 11/13/2012 12:51
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: ZB-624 (30) ID: 0.53(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 90540
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
108-88-3	Toluene	ND		1.0	0.51
156-60-5	trans-1,2-Dichloroethene	ND		1.0	0.90
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.37
79-01-6	Trichloroethene	0.462	J	1.0	0.46
75-69-4	Trichlorofluoromethane	ND		1.0	0.88
75-01-4	Vinyl chloride	ND		0.50	0.90

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	96		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	86		70-130
460-00-4	4-Bromofluorobenzene (Surr)	102		70-130

TCE 0.462 x 5 = 2.31 ug/L

2/18/13
TC

Nov SW

SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / (II) / III (circle one)

SITE: Olin Chemical Superfund Site Project #: 6107130016-10 SDG #: 480-27937-1

LAB #: TAL-Buffalo

Sample IDs: Attached tracking sheet

This checklist is designed to be used with USEPA Region I Validation Guidelines Part II (12/1996). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO	NA		
			Data completeness	
☑	☐	☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑	☐	☐	Data summaries match EDD	
			Holding Times and Preservation	
☑	☐	☐	Hold times met (Waters – Extract within 7 days, analyze within 40 days. Soils – extract within 14 days, analyze within 40 days)	
			Instrument Performance Check (Tune)	
☑	☐	☐	Tune available for each 12-hour period samples were analyzed	
☑	☐	☐	Appropriate number of significant figures reported (at least 2)	
☑	☐	☐	Mass/Charge list (m/z) criteria met	
			Initial Calibration	
☑	☐	☐	%RSD less than or equal to 30%	
☑	☐	☐	RRF greater than or equal to 0.05	
			Continuing Calibration	
☐	☑	☐	%D less than or equal to 25%	See attached Form VII
☑	☐	☐	RRF greater than or equal to 0.05.	
			Blank Contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.
☑	☐	☐	Method blank contamination	→ TIC's reported and removed from Sample see attached Form I
☐	☐	☑	Equipment/Rinseate blank contamination	
			↳ Not Collected	

*

SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

Yes	NO	N/A	TIER I / II / III (circle one)	
			Surrogate Recoveries	
☑	☐	☐	Surrogates percent recovery criteria met: Soil = (base/neutral 30%-130%, acid 30%-130%) Water = (base/neutral 30%-130%, acid 15%-110%)	
			Matrix Spikes and Laboratory Control Samples	
☐	☐	☑	MS/MSD percent recovery criteria met Soil and Water = (base/neutral 40%-140%, acid 30%-130%)	Not collected w/ this SDG
☐	☐	☑	MS/MSD RPD criteria met (soils <50%, water <30%)	
☐	☑	☐	LCS percent recovery criteria met soil/water (base 40%-140%, acid 30%-130%)	See attached Form III
			Field Duplicates	
☐	☐	☑	RPD criteria met (soils <50%, water <30%)	Not collected w/ this SDG
			Internal Standard	
☑	☐	☐	Area counts within -50 to +100 percent of calib. std.	
☑	☐	☐	Retention Time within 30 seconds of calib. std.	
			Target Compounds	
☑	☐	☐	Reviewed narrative for anomalies	
			Tentatively Identified Compounds (TICs)	
☐	☑	☐	TCL compounds reported as TICs	

Validator's Signature: [signature]

Date: ~~3/19/13~~ TC 3/15/13

reviewed re-submitted data from TAL on 3/13/13

Reference:

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name:	TestAmerica Buffalo	Job No.:	480-27937-1
SDG No.:			
Client Sample ID:	OC-SW-EDSD/SW7-XXX	Lab Sample ID:	480-27937-1
Matrix:	Water	Lab File ID:	X2176.D
Analysis Method:	8270D	Date Collected:	11/06/2012 09:30
Extract. Method:	3510C	Date Extracted:	11/13/2012 14:22
Sample wt/vol:	1030(mL)	Date Analyzed:	11/19/2012 14:41
Con. Extract Vol.:	1(mL)	Dilution Factor:	1
Injection Volume:	1(uL)	Level: (low/med)	Low
% Moisture:		GPC Cleanup:(Y/N)	N
Analysis Batch No.:	91743	Units:	ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
53-70-3	Dibenz(a,h)anthracene	ND		0.49	0.068
88-75-5	2-Nitrophenol	ND		4.9	0.060
100-52-7	Benzaldehyde	ND ~~0.075~~	~~J B~~	4.9	0.073
105-67-9	2,4-Dimethylphenol	ND		4.9	0.29
86-73-7	Fluorene	ND		0.97	0.056
117-84-0	Di-n-octyl phthalate	ND		4.9	0.19
86-74-8	Carbazole	ND		4.9	0.077
100-51-6	Benzyl alcohol	ND		9.7	0.66
50-32-8	Benzo[a]pyrene	ND		0.19	0.13
15831-10-4	3 & 4 Methylphenol	ND		4.9	0.089
100-01-6	4-Nitroaniline	ND		4.9	0.024
62-53-3	Aniline	ND		4.9	0.49
111-91-1	Bis(2-chloroethoxy)methane	ND		4.9	0.062
86-30-6	N-Nitrosodiphenylamine	ND		4.9	0.068
208-96-8	Acenaphthylene	ND		0.29	0.054
95-57-8	2-Chlorophenol	ND		4.9	0.064
101-55-3	4-Bromophenyl phenyl ether	ND		4.9	0.088
88-74-4	2-Nitroaniline	ND		4.9	0.092
87-86-5	Pentachlorophenol	ND		0.97	0.33
132-64-9	Dibenzofuran	ND		4.9	0.058
77-47-4	Hexachlorocyclopentadiene	ND	UJ	4.9	0.088
56-55-3	Benzo[a]anthracene	ND		0.29	0.033
218-01-9	Chrysene	ND		0.97	0.072
534-52-1	4,6-Dinitro-2-methylphenol	ND		4.9	0.72
95-94-3	1,2,4,5-Tetrachlorobenzene	ND		4.9	0.066
106-47-8	4-Chloroaniline	ND		4.9	0.13
121-14-2	2,4-Dinitrotoluene	ND		4.9	0.033
90-12-0	1-Methylnaphthalene	ND		4.9	4.9
207-08-9	Benzo[k]fluoranthene	ND		0.29	0.068
103-33-3	Azobenzene	ND		4.9	4.9
1912-24-9	Atrazine	ND		4.9	0.28
191-24-2	Benzo[g,h,i]perylene	ND		0.49	0.056
120-83-2	2,4-Dichlorophenol	ND		4.9	0.054
85-01-8	Phenanthrene	ND		0.39	0.060

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-27937-1

SDG No.:

Client Sample ID: OC-SW-EDSD/SW7-XXX | Lab Sample ID: 480-27937-1

Matrix: Water | Lab File ID: X2176.D

Analysis Method: 8270D | Date Collected: 11/06/2012 09:30

Extract. Method: 3510C | Date Extracted: 11/13/2012 14:22

Sample wt/vol: 1030(mL) | Date Analyzed: 11/19/2012 14:41

Con. Extract Vol.: 1(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 91743 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
105-60-2	Caprolactam	ND	✗ UJ	4.9	0.21
99-09-2	3-Nitroaniline	ND		4.9	0.13
206-44-0	Fluoranthene	ND		0.97	0.078
92-52-4	1,1'-Biphenyl	ND		4.9	0.033
205-99-2	Benzo[b]fluoranthene	ND		0.29	0.061
95-48-7	2-Methylphenol	ND		4.9	0.14
621-64-7	N-Nitrosodi-n-propylamine	ND		4.9	0.058
129-00-0	Pyrene	ND		4.9	0.074
65-85-0	Benzoic acid	~~ND~~	✗ R	4.9	0.66
91-57-6	2-Methylnaphthalene	ND		0.97	0.050
118-74-1	Hexachlorobenzene	ND		0.97	0.21
83-32-9	Acenaphthene	ND		0.97	0.035
108-60-1	2,2'-oxybis[1-chloropropane]	ND		4.9	0.083
101-84-8	Phenyl ether	ND		4.9	4.9
58-90-2	2,3,4,6-Tetrachlorophenol	ND		4.9	0.38
59-50-7	4-Chloro-3-methylphenol	ND		4.9	0.051
7005-72-3	4-Chlorophenyl phenyl ether	ND		4.9	0.045
117-81-7	Bis(2-ethylhexyl) phthalate	ND		1.9	0.41
85-68-7	Butyl benzyl phthalate	ND		4.9	0.16
84-74-2	Di-n-butyl phthalate	ND		4.9	0.34
78-59-1	Isophorone	ND		4.9	0.050
108-95-2	Phenol	ND		4.9	0.097
606-20-2	2,6-Dinitrotoluene	ND		4.9	0.088
84-66-2	Diethyl phthalate	ND		4.9	0.062
193-39-5	Indeno[1,2,3-cd]pyrene	ND		0.49	0.11
88-06-2	2,4,6-Trichlorophenol	ND		4.9	0.070
95-95-4	2,4,5-Trichlorophenol	ND		4.9	0.063
119-61-9	Benzophenone	ND		4.9	4.9
98-95-3	Nitrobenzene	ND		4.9	0.063
120-12-7	Anthracene	ND		0.97	0.033
111-44-4	Bis(2-chloroethyl)ether	ND		4.9	0.070
91-58-7	2-Chloronaphthalene	ND	✗ UJ	4.9	0.064
51-28-5	2,4-Dinitrophenol	ND	✗ UJ	4.9	0.58
100-02-7	4-Nitrophenol	~~ND~~	R	4.9	0.38

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TestAmerica Buffalo | Job No.: 480-27937-1

SDG No.:

Client Sample ID: OC-SW-EDSD/SW7-XXX | Lab Sample ID: 480-27937-1

Matrix: Water | Lab File ID: X2176.D

Analysis Method: 8270D | Date Collected: 11/06/2012 09:30

Extract. Method: 3510C | Date Extracted: 11/13/2012 14:22

Sample wt/vol: 1030(mL) | Date Analyzed: 11/19/2012 14:41

Con. Extract Vol.: 1(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 91743 | Units: ug/L

Number TICs Found: 10 | TIC Result Total: 11.06

CAS NO.	COMPOUND NAME	RT	RESULT	Q
	~~Unknown~~	~~4.25~~	~~0.71~~	~~T J~~
	Unknown	4.57	0.70	~~T~~ J N
124-18-5	Decane	6.40	0.61	T J N
	Unknown	7.83	1.5	~~T~~ J N
3302-10-1	Hexanoic acid, 3,5,5-trimethyl-	7.88	0.62	~~T~~ J N
~~540-97-6~~	~~Cyclohexasiloxane, dodecamethyl-~~	~~9.41~~	~~0.90~~	~~T J N~~
	~~Unknown~~	~~14.51~~	~~0.88~~	~~T J~~
111-6-8	Hexadecanoic acid, butyl ester	14.65	0.74	~~T~~ J N
	~~Unknown~~	~~15.05~~	~~1.3~~	~~T J~~
	~~Unknown~~	~~15.84~~	~~3.1~~	~~T J~~

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Matrix: Water Level: Low Lab File ID: X2172.D

Lab ID: LCS 480-90647/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#	
Dibenz(a,h)anthracene	2.00	2.17	109	40-140		
2-Nitrophenol	2.00	1.83 J	92	40-140		
Benzaldehyde	10.0	9.40	94	40-140		
2,4-Dimethylphenol	2.00	2.10 J	105	30-130		
Fluorene	2.00	2.08	104	40-140		
Di-n-octyl phthalate	2.00	2.46 J	123	40-140		
Benzyl alcohol	2.00	1.94 J	97	40-140		
Benzo[a]pyrene	2.00	1.77	89	40-140		
3 & 4 Methylphenol	2.00	9.49	475	30-130	*	no hits
4-Nitroaniline	2.00	1.79 J	90	40-140		
Aniline	12.0	9.08	76	40-140		
Bis(2-chloroethoxy)methane	2.00	1.84 J	92	40-140		
N-Nitrosodiphenylamine	2.00	6.92	346	40-140	*	no hits
Acenaphthylene	2.00	2.15	108	40-140		
2-Chlorophenol	2.00	1.59 J	80	30-130		
4-Bromophenyl phenyl ether	2.00	2.10 J	105	40-140		
2-Nitroaniline	2.00	2.04 J	102	40-140		
Pentachlorophenol	2.00	2.22	111	30-130		
Dibenzofuran	2.00	2.08 J	104	40-140		
Hexachlorocyclopentadiene	2.00	1.58 J	79	40-140		
Benzo[a]anthracene	2.00	2.11	106	40-140		
Chrysene	2.00	2.16	108	40-140		
4,6-Dinitro-2-methylphenol	2.00	2.70 J	135	30-130	*	no hits
1,2,4,5-Tetrachlorobenzene	10.0	7.60	76	40-140		
4-Chloroaniline	2.00	1.92 J	96	40-140		
2,4-Dinitrotoluene	2.00	2.10 J	105	40-140		
Benzo[k]fluoranthene	2.00	1.98	99	40-140		
Azobenzene	12.0	10.9	91	40-140		
Atrazine	10.0	11.2	112	40-140		
Benzo[g,h,i]perylene	2.00	2.23	111	40-140		
2,4-Dichlorophenol	2.00	1.90 J	95	30-130		
Phenanthrene	2.00	2.19	109	40-140		
Caprolactam	10.0	2.97 J	30	40-140	*	
3-Nitroaniline	2.00	1.70 J	85	40-140		
Fluoranthene	2.00	2.13	106	40-140		
1,1'-Biphenyl	10.0	8.89	89	40-140		
Benzo[b]fluoranthene	2.00	2.05	102	40-140		
2-Methylphenol	2.00	1.72 J	86	30-130		
N-Nitrosodi-n-propylamine	2.00	2.11 J	106	40-140		
Pyrene	2.00	2.33 J	117	40-140		
Benzoic acid	2.00	ND	0.6	40-140	*	
2-Methylnaphthalene	2.00	1.82	91	40-140		

Column to be used to flag recovery and RPD values

FORM III 8270D

TC

03/13/2013

3/14/13

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Matrix: Water Level: Low Lab File ID: X2172.D

Lab ID: LCS 480-90647/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#	
Hexachlorobenzene	2.00	1.82	91	40-140		
Acenaphthene	2.00	1.86	93	40-140		
2,2'-oxybis[1-chloropropane]	2.00	1.56 J	78	40-140		
2,3,4,6-Tetrachlorophenol	10.0	9.30	93	40-140		
4-Chloro-3-methylphenol	2.00	2.20 J	110	30-130		
4-Chlorophenyl phenyl ether	2.00	2.16 J	108	40-140		
Bis(2-ethylhexyl) phthalate	2.00	2.42	121	40-140		
Butyl benzyl phthalate	2.00	2.59 J	130	40-140		
Di-n-butyl phthalate	2.00	2.48 J	124	40-140		
Isophorone	2.00	2.21 J	110	40-140		
Phenol	2.00	1.60 J	80	30-130		
2,6-Dinitrotoluene	2.00	1.20 J	60	40-140		
Diethyl phthalate	2.00	2.20 J	110	40-140		
Indeno[1,2,3-cd]pyrene	2.00	2.19	110	40-140		
2,4,6-Trichlorophenol	2.00	1.83 J	91	30-130		
2,4,5-Trichlorophenol	2.00	1.79 J	90	30-130		
Nitrobenzene	2.00	1.94 J	97	40-140		
Anthracene	2.00	2.15	108	40-140		
Bis(2-chloroethyl)ether	2.00	1.80 J	90	40-140		
2-Chloronaphthalene	2.00	8.80	440	40-140	*	no hits
2,4-Dinitrophenol	2.00	0.635 J	32	30-130		
4-Nitrophenol	2.00	1.84 J	92	30-130		
Acetophenone	20.0	19.0	95	40-140		
1,2-Dichlorobenzene	2.00	1.71 J	85	40-140		
3,3'-Dichlorobenzidine	2.00	2.01 J	101	40-140		
Hexachloroethane	2.00	1.79 J	90	40-140		
Dimethyl phthalate	2.00	1.98 J	99	40-140		
4-Methylphenol	2.00	9.49	475			no hits

Column to be used to flag recovery and RPD values

FORM III 8270D

TC
3/15/13

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Matrix: Water Level: Low Lab File ID: X2173.D

Lab ID: LCSD 480-90647/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#	
Dibenz(a,h)anthracene	2.00	2.34	117	7	20	40-140		
2-Nitrophenol	2.00	1.74 J	87	5	20	40-140		
Benzaldehyde	10.0	8.65	86	8	20	40-140		
2,4-Dimethylphenol	2.00	2.15 J	108	2	20	30-130		
Fluorene	2.00	2.04	102	2	20	40-140		
Di-n-octyl phthalate	2.00	2.45 J	122	0	20	40-140		
Benzyl alcohol	2.00	1.57 J	79	21	20	40-140	*	
Benzo[a]pyrene	2.00	1.83	91	3	20	40-140		
3 & 4 Methylphenol	2.00	9.92	496	4	20	30-130	*	no hits
4-Nitroaniline	2.00	1.82 J	91	2	20	40-140		
Aniline	12.0	8.98	75	1	20	40-140		
Bis(2-chloroethoxy)methane	2.00	1.81 J	91	1	20	40-140		
N-Nitrosodiphenylamine	2.00	7.47	374	8	20	40-140	*	no hits
Acenaphthylene	2.00	2.12	106	2	20	40-140		
2-Chlorophenol	2.00	1.60 J	80	1	20	30-130		
4-Bromophenyl phenyl ether	2.00	2.03 J	101	3	20	40-140		
2-Nitroaniline	2.00	1.86 J	93	9	20	40-140		
Pentachlorophenol	2.00	2.10	105	6	20	30-130		
Dibenzofuran	2.00	2.00 J	100	4	20	40-140		
Hexachlorocyclopentadiene	2.00	1.50 J	75	5	20	40-140		
Benzo[a]anthracene	2.00	2.29	114	8	20	40-140		
Chrysene	2.00	2.19	109	1	20	40-140		
4,6-Dinitro-2-methylphenol	2.00	2.75 J	138	2	20	30-130	*	no hits
1,2,4,5-Tetrachlorobenzene	10.0	7.67	77	1	20	40-140		
4-Chloroaniline	2.00	1.91 J	95	1	20	40-140		
2,4-Dinitrotoluene	2.00	2.14 J	107	2	20	40-140		
Benzo[k]fluoranthene	2.00	1.93	96	3	20	40-140		
Azobenzene	12.0	12.1	101	11	20	40-140		
Atrazine	10.0	10.8	108	4	20	40-140		
Benzo[g,h,i]perylene	2.00	2.19	109	2	20	40-140		
2,4-Dichlorophenol	2.00	1.72 J	86	9	20	30-130		
Phenanthrene	2.00	2.31	115	5	20	40-140		
Caprolactam	10.0	3.05 J	30	3	20	40-140	*	
3-Nitroaniline	2.00	1.97 J	99	15	20	40-140		
Fluoranthene	2.00	2.33	116	9	20	40-140		
1,1'-Biphenyl	10.0	8.36	84	6	20	40-140		
Benzo[b]fluoranthene	2.00	1.90	95	7	20	40-140		
2-Methylphenol	2.00	1.64 J	82	5	20	30-130		
N-Nitrosodi-n-propylamine	2.00	2.07 J	104	2	20	40-140		
Pyrene	2.00	2.36 J	118	1	20	40-140		
Benzoic acid	2.00	ND	0	200	20	40-140	*	
2-Methylnaphthalene	2.00	1.78	89	2	20	40-140		

Column to be used to flag recovery and RPD values

FORM III 8270D

3/15/13 TC

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Matrix: Water Level: Low Lab File ID: X2173.D

Lab ID: LCSD 480-90647/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Hexachlorobenzene	2.00	2.07	104	13	20	40-140	
Acenaphthene	2.00	1.81	91	2	20	40-140	
2,2'-oxybis[1-chloropropane]	2.00	1.50 J	75	4	20	40-140	
2,3,4,6-Tetrachlorophenol	10.0	9.63	96	3	20	40-140	
4-Chloro-3-methylphenol	2.00	2.06 J	103	7	20	30-130	
4-Chlorophenyl phenyl ether	2.00	2.02 J	101	7	20	40-140	
Bis(2-ethylhexyl) phthalate	2.00	2.51	125	3	20	40-140	
Butyl benzyl phthalate	2.00	2.51 J	126	3	20	40-140	
Di-n-butyl phthalate	2.00	2.47 J	124	0	20	40-140	
Isophorone	2.00	2.14 J	107	3	20	40-140	
Phenol	2.00	1.45 J	73	10	20	30-130	
2,6-Dinitrotoluene	2.00	1.19 J	60	1	20	40-140	
Diethyl phthalate	2.00	2.13 J	106	3	20	40-140	
Indeno[1,2,3-cd]pyrene	2.00	2.32	116	6	20	40-140	
2,4,6-Trichlorophenol	2.00	1.88 J	94	3	20	30-130	
2,4,5-Trichlorophenol	2.00	2.06 J	103	14	20	30-130	
Nitrobenzene	2.00	1.73 J	87	12	20	40-140	
Anthracene	2.00	2.27	113	5	20	40-140	
Bis(2-chloroethyl)ether	2.00	1.64 J	82	9	20	40-140	
2-Chloronaphthalene	2.00	2.75 J	137	105	20	40-140	*
2,4-Dinitrophenol	2.00	2.44 J	122	117	20	30-130	*
4-Nitrophenol	2.00	ND	0	200	20	30-130	*
Acetophenone	20.0	18.6	93	2	20	40-140	
1,2-Dichlorobenzene	2.00	1.49 J	74	14	20	40-140	
3,3'-Dichlorobenzidine	2.00	2.04 J	102	1	20	40-140	
Hexachloroethane	2.00	1.54 J	77	15	20	40-140	
Dimethyl phthalate	2.00	2.02 J	101	2	20	40-140	
4-Methylphenol	2.00	9.92	496	4			

no hits

Column to be used to flag recovery and RPD values

FORM III 8270D

3/15/13

03/13/2013 TC

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Lab Sample ID: CCVIS 480-91743/2 Calibration Date: 11/19/2012 10:27

Instrument ID: HP5973X Calib Start Date: 11/05/2012 12:04

GC Column: RXI-5Sil MS ID: 0.25(mm) Calib End Date: 11/05/2012 15:27

Lab File ID: X2166.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,4-Dioxane	Ave	0.5063	0.5185		5120	5000	2.4	20.0
N-Nitrosodimethylamine	Ave	0.5993	0.5995		5000	5000	0.0	20.0
Pyridine	Ave	0.9234	0.9671		5240	5000	4.7	20.0
Benzaldehyde	Ave	0.9942	1.015	0.0100	5110	5000	2.1	20.0
Aniline	Ave	1.913	2.048		5350	5000	7.0	20.0
Phenol	Ave	1.609	1.704	0.7000	5300	5000	5.9	20.0
Bis(2-chloroethyl)ether	Ave	1.312	1.308	0.6000	4990	5000	-0.2	20.0
2-Chlorophenol	Ave	1.366	1.412	0.8000	5170	5000	3.4	20.0
1,3-Dichlorobenzene	Ave	1.607	1.575		4900	5000	-2.0	20.0
1,4-Dichlorobenzene	Ave	1.668	1.606		4810	5000	-3.7	20.0
Benzyl alcohol	Ave	0.6251	0.5878		4700	5000	-6.0	20.0
1,2-Dichlorobenzene	Ave	1.513	1.513		5000	5000	0.0	20.0
2-Methylphenol	Ave	1.083	1.205	0.6000	5560	5000	11.3	20.0
2,2'-oxybis[1-chloropropane]	Ave	2.006	1.749	0.0100	4360	5000	-12.8	20.0
Acetophenone	Ave	1.700	1.841	0.0100	5420	5000	8.3	20.0
N-Nitrosodi-n-propylamine	Ave	0.8384	0.9114	0.0500	5440	5000	8.7	20.0
4-Methylphenol	Ave	1.176	1.232	0.6000	5240	5000	4.8	20.0
Hexachloroethane	Ave	0.5508	0.5570	0.3000	5060	5000	1.1	20.0
Nitrobenzene	Ave	0.3344	0.3431	0.1000	5130	5000	2.6	20.0
Isophorone	Ave	0.5533	0.6243	0.3000	5640	5000	12.8	20.0
2-Nitrophenol	Ave	0.1665	0.1843	0.0500	5540	5000	10.7	20.0
2,4-Dimethylphenol	Ave	0.2783	0.3117	0.1000	5600	5000	12.0	20.0
Bis(2-chloroethoxy)methane	Ave	0.4010	0.3971	0.2000	4950	5000	-1.0	20.0
Benzoic acid	QuaF		0.1117		4290	5000	-14.2	20.0
2,4-Dichlorophenol	Ave	0.2602	0.2811	0.1000	5400	5000	8.0	20.0
1,2,4-Trichlorobenzene	Ave	0.3188	0.3174		4980	5000	-0.4	20.0
Naphthalene	Ave	1.140	1.131	0.6000	4960	5000	-0.8	20.0
4-Chloroaniline	Ave	0.4119	0.4436	0.0100	5380	5000	7.7	20.0
Hexachlorobutadiene	Ave	0.1552	0.1475	0.0100	4750	5000	-5.0	20.0
Caprolactam	Ave	0.0941	0.0940	0.0100	5000	5000	-0.0	20.0
4-Chloro-3-methylphenol	Lin1		0.2868	0.2000	4980	5000	-0.4	20.0
2-Methylnaphthalene	Ave	0.7464	0.7799	0.4000	5220	5000	4.5	20.0
1-Methylnaphthalene	Ave	0.6929	0.7182		5180	5000	3.7	20.0
Hexachlorocyclopentadiene	Lin1		0.1517	0.0500	3710	5000	-25.9*	20.0
1,2,4,5-Tetrachlorobenzene	Ave	0.4718	0.4580	0.0100	4850	5000	-2.9	20.0
2,4,6-Trichlorophenol	Ave	0.2838	0.2966	0.2000	5230	5000	4.5	20.0
2,4,5-Trichlorophenol	Lin1		0.2794	0.2000	4830	5000	-3.5	20.0
1,1'-Biphenyl	Ave	1.504	1.484	0.0100	4930	5000	-1.3	20.0
2-Chloronaphthalene	Lin1		1.073	0.8000	5120	5000	2.4	20.0
Phenyl ether	Ave	0.7391	0.7736		5230	5000	4.7	20.0
2-Nitroaniline	Ave	0.2593	0.2625	0.0100	5060	5000	1.2	20.0

TC

3/15/13

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Lab Sample ID: CCVIS 480-91743/2 Calibration Date: 11/19/2012 10:27

Instrument ID: HP5973X Calib Start Date: 11/05/2012 12:04

GC Column: RXI-5Sil MS ID: 0.25(mm) Calib End Date: 11/05/2012 15:27

Lab File ID: X2166.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dimethyl phthalate	Ave	1.195	1.246	0.0100	5210	5000	4.3	20.0
2,6-Dinitrotoluene	Ave	0.5273	0.5951	0.1000	5640	5000	12.8	20.0
Acenaphthylene	Ave	1.630	1.771	0.9000	5430	5000	8.7	20.0
3-Nitroaniline	Lin1		0.2832	0.0100	4560	5000	-8.9	20.0
Acenaphthene	Ave	1.167	1.156	0.9000	4950	5000	-1.0	20.0
2,4-Dinitrophenol	QuaF		0.1117	0.0100	12900	10000	29.1*	20.0
Dibenzofuran	Ave	1.513	1.546	0.8000	5110	5000	2.2	20.0
2,4-Dinitrotoluene	Lin1		0.3479	0.2000	4760	5000	-4.8	20.0
4-Nitrophenol	Lin1		0.1303	0.0500	10700	10000	7.0	20.0
2,3,4,6-Tetrachlorophenol	Ave	0.2228	0.2513	0.0100	5640	5000	12.8	20.0
Diethyl phthalate	Ave	1.170	1.234	0.0100	5280	5000	5.5	20.0
Fluorene	Ave	1.255	1.301	0.8000	5180	5000	3.6	20.0
4-Chlorophenyl phenyl ether	Ave	0.5644	0.5511	0.4000	4880	5000	-2.4	20.0
4-Nitroaniline	Lin1		0.3058	0.0100	4830	5000	-3.4	20.0
4,6-Dinitro-2-methylphenol	Lin1		0.1935	0.0100	10700	10000	6.9	20.0
Diphenylamine	Ave	1.026	1.224		5970	5000	19.3	20.0
N-Nitrosodiphenylamine	Ave	1.026	1.224	0.0100	5970	5000	19.3	20.0
1,2-Diphenylhydrazine	Ave	0.6791	0.6980		5140	5000	2.8	20.0
Azobenzene	Ave	0.6980	0.6980		5000	5000	0.0	20.0
Benzophenone	Ave	1.139	1.206		5290	5000	5.8	20.0
4-Bromophenyl phenyl ether	Ave	0.1843	0.1878	0.1000	5090	5000	1.9	20.0
Hexachlorobenzene	Ave	0.1915	0.1874	0.1000	4890	5000	-2.2	20.0
Atrazine	Ave	0.3213	0.3521	0.0100	11000	10000	9.6	20.0
Pentachloronitrobenzene	Ave	0.0677	0.0739		5460	5000	9.1	20.0
Pentachlorophenol	Lin1		0.1020	0.0500	10700	10000	7.1	20.0
Phenanthrene	Ave	1.082	1.133	0.6000	5230	5000	4.7	20.0
Anthracene	Ave	1.061	1.172	0.6000	5520	5000	10.4	20.0
Carbazole	Ave	1.011	1.121	0.0100	5540	5000	10.9	20.0
Di-n-butyl phthalate	Ave	1.107	1.250	0.0100	5650	5000	12.9	20.0
Fluoranthene	Ave	1.054	1.155	0.6000	5480	5000	9.6	20.0
Benzidine	Ave	0.4065	0.5963		7330	5000	46.7*	20.0
Pyrene	Ave	1.189	1.317	0.6000	5540	5000	10.8	20.0
Butyl benzyl phthalate	Ave	0.5886	0.6858	0.0100	5830	5000	16.5	20.0
3,3'-Dichlorobenzidine	Ave	0.4037	0.4577	0.0100	5670	5000	13.4	20.0
Bis(2-ethylhexyl) phthalate	Ave	0.7696	0.9109	0.0100	5920	5000	18.4	20.0
Benzo[a]anthracene	Ave	1.076	1.138	0.6000	5290	5000	5.8	20.0
Chrysene	Lin1		1.107	0.6000	5090	5000	1.7	20.0
Di-n-octyl phthalate	Ave	1.233	1.472	0.0100	5970	5000	19.4	20.0
Benzo[b]fluoranthene	Ave	1.188	1.141	0.7000	4800	5000	-4.0	20.0
Benzo[k]fluoranthene	Ave	1.231	1.210	0.7000	4920	5000	-1.6	20.0
Benzo[a]pyrene	Ave	1.037	1.020	0.7000	4910	5000	-1.7	20.0

not reported

TC

3/15/13

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-27937-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 480-90647/1-A
Matrix: Water
Lab File ID: X2171.D
Analysis Method: 8270D
Date Collected:
Extract. Method: 3510C
Date Extracted: 11/13/2012 14:22
Sample wt/vol: 1000(mL)
Date Analyzed: 11/19/2012 12:33
Con. Extract Vol.: 1(mL)
Dilution Factor: 1
Injection Volume: 1(uL)
Level: (low/med) Low
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 91743
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
53-70-3	Dibenz(a,h)anthracene	ND		0.50	0.070
88-75-5	2-Nitrophenol	ND		5.0	0.062
100-52-7	Benzaldehyde	0.192	J	5.0	0.075
105-67-9	2,4-Dimethylphenol	ND		5.0	0.30
86-73-7	Fluorene	ND		1.0	0.058
117-84-0	Di-n-octyl phthalate	ND		5.0	0.20
86-74-8	Carbazole	ND		5.0	0.079
100-51-6	Benzyl alcohol	ND		10	0.68
50-32-8	Benzo[a]pyrene	ND		0.20	0.13
15831-10-4	3 & 4 Methylphenol	ND		5.0	0.092
100-01-6	4-Nitroaniline	ND		5.0	0.025
62-53-3	Aniline	ND		5.0	0.50
111-91-1	Bis(2-chloroethoxy)methane	ND		5.0	0.064
86-30-6	N-Nitrosodiphenylamine	ND		5.0	0.070
208-96-8	Acenaphthylene	ND		0.30	0.056
95-57-8	2-Chlorophenol	ND		5.0	0.066
101-55-3	4-Bromophenyl phenyl ether	ND		5.0	0.091
88-74-4	2-Nitroaniline	ND		5.0	0.095
87-86-5	Pentachlorophenol	ND		1.0	0.34
132-64-9	Dibenzofuran	ND		5.0	0.060
77-47-4	Hexachlorocyclopentadiene	ND		5.0	0.091
56-55-3	Benzo[a]anthracene	ND		0.30	0.034
218-01-9	Chrysene	ND		1.0	0.074
534-52-1	4,6-Dinitro-2-methylphenol	ND		5.0	0.74
95-94-3	1,2,4,5-Tetrachlorobenzene	ND		5.0	0.068
106-47-8	4-Chloroaniline	ND		5.0	0.13
121-14-2	2,4-Dinitrotoluene	ND		5.0	0.034
90-12-0	1-Methylnaphthalene	ND		5.0	5.0
207-08-9	Benzo[k]fluoranthene	ND		0.30	0.070
103-33-3	Azobenzene	ND		5.0	5.0
1912-24-9	Atrazine	ND		5.0	0.29
191-24-2	Benzo[g,h,i]perylene	ND		0.50	0.058
120-83-2	2,4-Dichlorophenol	ND		5.0	0.056
85-01-8	Phenanthrene	0.0715	J	0.40	0.062

no detection in sample

TC
3/15/13

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-27937-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 480-90647/1-A

Matrix: Water | Lab File ID: X2171.D

Analysis Method: 8270D | Date Collected:

Extract. Method: 3510C | Date Extracted: 11/13/2012 14:22

Sample wt/vol: 1000(mL) | Date Analyzed: 11/19/2012 12:33

Con. Extract Vol.: 1(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 91743 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
98-86-2	Acetophenone	0.236	J	5.0	0.10
95-50-1	1,2-Dichlorobenzene	ND		5.0	0.057
91-94-1	3,3'-Dichlorobenzidine	ND		5.0	0.22
67-72-1	Hexachloroethane	ND		5.0	0.088
131-11-3	Dimethyl phthalate	ND		5.0	0.057

CAS NO.	SURROGATE	%REC	Q	LIMITS
118-79-6	2,4,6-Tribromophenol	66		15-110
4165-60-0	Nitrobenzene-d5	73		30-130
4165-62-2	Phenol-d5	26		15-110
321-60-8	2-Fluorobiphenyl	80		30-130
1718-51-0	p-Terphenyl-d14	116		30-130
367-12-4	2-Fluorophenol	47		15-110

TC

3/15/13

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER I / (II) / III (circle one)

SITE: **Olin Chemical** Project #: 6107130016-10 SDG #: 480-27937-1

LAB # :

Sample IDs: Attached tracking sheet or sample listing.

This checklist is designed to be used with the USEPA Data Validation Guidelines Part IV (November 2008). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO	NA		
Data completeness				
☑	☐	☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑	☐	☐	Data summaries match EDD	
Holding Times and Preservation				
☑	☐	☐	Hold times met (6 months, 28 days Hg)	
☑	☐	☐	Preserved (waters HNO_3)	
Calibration				
☐	☐	☑	ICP/MS Instrument Tune. } Not provided in Raw data	Verify that tuning meets mass, resolution, and RSD method criteria.
☐	☐	☑	Appropriate number of standards used to establish calibration curve.	ICP: at least one blank and one standard Hg: at least one blank and four standards
☑	☐	☐	Correlation coefficient > 0.995 for Hg	Correlation coefficient criteria applicable to all analyses except ICP-AES.
☑	☐	☐	Calibrated daily.	
☑	☐	☐	ICV/CCV %R within acceptance range.	90-110% for ICP-AES/MS, 80-120% for Hg. See additional qualification actions in the Region 1 guidelines.
☑	☐	☐	CCVs analyzed at the proper frequency.	Every 10 samples or every 2 hrs.
☐	☑	☐	QL Standard within limits	70-130% for QL Standard. If out low, (J) detects less then 2X QL standard and (UJ) non-detects. See additional validation actions in the Region I guidelines.

→ Tin was recovered @ 54% and 63%

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

Yes	No	N/A	TIER I / (II) / III (circle one)	
			Blanks	
			Method:	Evaluate all blanks for contamination. Highest contaminant level used for action level. 5X the highest blank contamination is the action level.
☑	☐	☐	Method blank was prepared with each batch of samples or with a maximum of 20 samples	
☑	☐	☐	Results >MDL K @ 0.271, Na @ 0.614, Cu 0.310	no sample results affected
☐	☑	☐	Absolute value negative MB results > 5x MDL	
☑	☐	☐	For ICP/MS verify IS responses meet method criteria	
			Calibration Blanks:	
☑	☐	☐	ICB/CCB results > IDL → Al @ 0.0693 x 5 = 0.346 V Qual Sample	
☐	☑	☐	Absolute value of negative ICB/CCB results > 5x MDL	
☑	☐	☐	CCB analyzed every 10 samples or 2 hrs.	
			Equipment/Rinseate Blanks:	
☐	☐	☑	Results >MDL not collected	
☐	☐	☑	Absolute value of negative ICB/CCB results > 5x MDL	
			Interference Check Sample	
☑	☐	☐	ICS analyzed at proper frequency	An ICS must be run at the beginning and end of run or every 8 hours.
☐	☑	☐	Interference present in sample at > 50% concentration in ICS	If interferences (Al, Ca, Fe, Mg) are not > 50% ICS concentration in sample, do not apply.
☑	☐	☐	ICS AB %R 80%-120% → Copper @ 2ppb in ICSA mix	
			ICP-MS Internal Standard Intensities	
☑	☐	☐	Internal standard relative intensities reported by the laboratory	
☑	☐	☐	Internal standard relative intensities are within 60 – 125 %	Qualify data based on Region 1 guideline
			Matrix Spikes	
☐	☐	☑	All compounds are within %R of 75-125% excluding results exceeding the spike concentration by ≥4x	No MS/MSD samples submitted
☐	☐	☑	Were post-digestion spikes reported for unacceptable pre-digestion spike recoveries	
☐	☐	☑	Was a field blank used for spike analysis	Post-digestion spikes %R limits = 75% - 125%

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

Yes	No	N/A	TIER I / II / III (circle one)	
			Laboratory Control Samples (LCS)	
☑	☐	☐	Percent recoveries are within limits (waters and soil 80-120%)	
☑	☐	☐	An LCS was analyzed for each matrix, batch of samples, or every 20 samples.	
			Laboratory Duplicate	
☐	☐	☑	Was a field blank used as the lab duplicate	
☐	☐	☑	Is the RPD within water control limits of ±20% for sample values >5x RL(35% for soil)	only 1 sample in SDG Lab Dup is N/A
☐	☐	☑	Is the control limit of ± RL met for sample values <5x RL (2x RL for soil)	
☐	☐	☑	Was a duplicate analyzed for every matrix and every 20 samples or batch	
			Field Duplicate	
☐	☐	☑	For sample values >5x RL, the RPD control limit of ± 30% (50% for soil) was met	not submitted
☐	☐	☑	For sample values <5x RL, the control limit of ±2x RL (4x RL for soil) was met	
			Serial Dilution	
☐	☐	☑	Are any percent difference criteria > 15% (for samples with a concentration >50 times the IDL)	not performed
☐	☐	☑	Are results of the diluted samples > the original sample results	

Validator's Signature: [signature]

Date: 2/20/13

Reference:

MACTEC, Project Operation Plan Volume IIB, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. .April 2009.

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: OC-SW-EDSD/SW7-XXX

Lab Sample ID: 480-27937-1

Lab Name: TestAmerica Buffalo

Job No.: 480-27937-1

SDG ID.:

Matrix: Water

Date Sampled: 11/06/2012 09:30

Reporting Basis: WET

Date Received: 11/07/2012 07:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-38-2	Arsenic	ND	0.010	0.0056	mg/L			1	6010
7440-39-3	Barium	0.036	0.010	0.00070	mg/L			1	6010
7440-41-7	Beryllium	ND	0.0010	0.00030	mg/L			1	6010
7440-43-9	Cadmium	ND	0.0010	0.00050	mg/L			1	6010
7440-47-3	Chromium	0.0041	0.0050	0.0010	mg/L	J		1	6010
7440-02-0	Nickel	0.0039	0.010	0.0013	mg/L	J		1	6010
7440-28-0	Thallium	ND	0.010	0.010	mg/L			1	6010
7440-62-2	Vanadium	ND	0.010	0.0015	mg/L			1	6010
7440-66-6	Zinc	0.023	0.050	0.0015	mg/L	J		1	6010
7782-49-2	Selenium	ND	0.010	0.0087	mg/L			1	6010
7440-36-0	Antimony	ND	0.0060	0.0068	mg/L			1	6010
7429-90-5	Aluminum	ND ~~0.14~~	0.20	0.060	mg/L	J		1	6010
7440-70-2	Calcium	42	0.50	0.10	mg/L			1	6010
7440-48-4	Cobalt	0.0024	0.0040	0.00063	mg/L	J		1	6010
7440-09-7	Potassium	6.1	0.50	0.10	mg/L		~~B~~	1	6010
7439-95-4	Magnesium	6.5	0.20	0.043	mg/L			1	6010
7439-96-5	Manganese	0.66	0.0030	0.00040	mg/L			1	6010
7440-23-5	Sodium	78	1.0	0.32	mg/L		~~B~~	1	6010
7440-31-5	Tin	ND	0.010	0.0051	mg/L	UJ		1	6010
7439-89-6	Iron	0.79	0.050	0.019	mg/L			1	6010
7440-22-4	Silver	ND	1.0	0.014	ug/L			1	6020A
7439-92-1	Lead	0.50	1.0	0.069	ug/L	J		1	6020A
7440-50-8	Copper	2.9	1.0	0.22	ug/L		~~B~~	1	6020A
7439-97-6	Mercury	ND	0.00020	0.00012	mg/L			1	7470A

TC 2/20/13

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	ICB 480-90116/6 11/09/2012 16:49		CCB 480-90116/13 11/09/2012 21:31		CCB 480-90116/25 11/09/2012 21:56		CCB 480-90116/37 11/09/2012 22:24	
		Found	C	Found	C	Found	C	Found	C
Aluminum	0.20	ND		ND		ND		0.0693	J
Antimony	0.0060	ND		ND		ND		ND	
Arsenic	0.010	ND		ND		ND		ND	
Barium	0.010	ND		ND		ND		ND	
Beryllium	0.0010	0.000640	J	ND		ND		0.00120	
Cadmium	0.0010	ND		ND		ND		ND	
Calcium	0.50	ND		ND		ND		0.162	J
Chromium	0.0050	ND		ND		ND		ND	
Cobalt	0.0040	ND		ND		ND		ND	
Iron	0.050	0.0319	J	ND		ND		0.0607	
Magnesium	0.20	ND		ND		ND		ND	
Manganese	0.0030	ND		ND		ND		ND	
Nickel	0.010	ND		ND		ND		ND	
Potassium	0.50	ND		0.346	J	0.109	J	0.145	J
Selenium	0.010	ND		ND		ND		ND	
Sodium	1.0	ND		0.933	J	ND		ND	
Thallium	0.010	ND		ND		ND		ND	
Tin	0.010	ND		ND		ND		ND	
Vanadium	0.010	ND		ND		ND		ND	
Zinc	0.050	ND		ND		ND		ND	

	mg/L conc	5X (TC)	Sample Qualified (U)
Fe	.0607	~~3.33~~ 0.3	~~Y~~ N
Al	0.0693	0.346	Y

Italicized analytes were not requested for this sequence.

2/20/13
TC

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Method: 6010 Instrument ID: ICAP1

Lab Sample ID: CRI 480-90116/7 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00043

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Arsenic	0.0100	0.0102		102	70-130
Barium	0.00200	0.00215	J	108	70-130
Beryllium	0.00200	0.00210		105	70-130
Cadmium	0.00100	0.000870	J	87	70-130
Chromium	0.00400	0.00428	J	107	70-130
Nickel	0.0100	0.00992	J	99	70-130
Thallium	0.0200	0.0213		106	70-130
Vanadium	0.00500	0.00470	J	94	70-130
Zinc	0.0100	0.0113	J	113	70-130
Selenium	0.0150	0.0169		113	70-130
Antimony	0.0200	0.0205		103	70-130
Aluminum	0.200	0.215		107	70-130
Calcium	0.500	0.503		101	70-130
Cobalt	0.00400	0.00403		101	70-130
Potassium	0.500	0.570		114	70-130
Magnesium	0.200	0.207		104	70-130
Manganese	0.00300	0.00307		102	70-130
Sodium	1.00	1.06		106	70-130
Tin	0.0100	0.00537	J ^	54	70-130
Iron	0.0500	0.0562		112	70-130

Lab Sample ID: CRI 480-90116/47 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00043

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Arsenic	0.0100	0.0116		116	70-130
Barium	0.00200	0.00215	J	108	70-130
Beryllium	0.00200	0.00207		104	70-130
Cadmium	0.00100	0.00108		108	70-130
Chromium	0.00400	0.00403	J	101	70-130
Nickel	0.0100	0.00974	J	97	70-130
Thallium	0.0200	0.0209		105	70-130
Vanadium	0.00500	0.00522	J	104	70-130
Zinc	0.0100	0.0115	J	115	70-130
Selenium	0.0150	0.0156		104	70-130

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IIB-IN

2/20/13
TC

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Method: 6010 Instrument ID: ICAP1

Lab Sample ID: CRI 480-90116/47 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00043

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Antimony	0.0200	0.0196		98	70-130
Aluminum	0.200	0.215		108	70-130
Calcium	0.500	0.510		102	70-130
Cobalt	0.00400	0.00391	J	98	70-130
Potassium	0.500	0.636		127	70-130
Magnesium	0.200	0.205		103	70-130
Manganese	0.00300	0.00311		104	70-130
Sodium	1.00	1.17		117	70-130
Tin	0.0100	0.00633	J ^	63	70-130
Iron	0.0500	0.0574		115	70-130

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IIB-IN

2/20/13
TC

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Lab Sample ID: ICSA 480-90363/8 Instrument ID: ELAN

Lab File ID: e111012A2a.rep ICS Source: MEM_07_ICSA_00042

Concentration Units: ug/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Copper		**2.20**	
Lead		**0.231**	
Silver		**0.216**	
Antimony		*0.442*	
Arsenic		*0.407*	
Barium		*0.273*	
Beryllium		*0.0079*	
Cadmium		*0.0454*	
Chromium		*1.76*	
Mn		*1.69*	
Molybdenum	*2000*	*2081*	*104*
Nickel		*4.19*	
Selenium		*-1.37*	
Thallium		*0.0236*	
Vanadium		*0.109*	
Zinc		*6.24*	

Lab Narrative States that ICSA mix has trace Concentration of Copper that are consistant w/ what manufacturer is reporting No Quals

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IVA-IN

2/20/13
TC

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-27937-1

SDG No.:

Lab Sample ID: ICSA 480-90363/45 Instrument ID: ELAN

Lab File ID: e111012A2a.rep ICS Source: MEM_07_ICSA_00042

Concentration Units: ug/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Copper		**2.28**	
Lead		**0.250**	
Silver		**0.228**	
Antimony		*0.432*	
Arsenic		*0.468*	
Barium		*0.259*	
Beryllium		*0.0071*	
Cadmium		*0.0224*	
Chromium		*1.61*	
Mn		*1.56*	
Molybdenum	*2000*	*2136*	*107*
Nickel		*4.20*	
Selenium		*-1.47*	
Thallium		*0.0208*	
Vanadium		*0.160*	
Zinc		*6.46*	

Trace contamination
verified by manufacturer

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IVA-IN

TC
2/20/13

Review/Date_____

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION

STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date Tiye Cunningham 2-21-13
Sr.

Lab Report # 480-27937-1
Project # 610713001 6-10

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for **Sampling, Data Evaluation and Reporting Activities.**" MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? **Yes** [✓] No [ ] N/A [ ] Comments:
Check items received.

☑ *Name of Laboratory* ☑ *Address* ☑ *Project ID* ☑ *Phone #* ☑ *Sample identification – Field and Laboratory*

Client Information: ☑ *Name* ☑ *Address* ☑ *Client Contact* *(IDs must be cross-referenced)*

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement ***Yes*** [✓] *No* [ ] *N/A* [✓] *Comments:*

Does the laboratory report include a completed Analytical Report Certification in the required format?

***ACTION**: If no, contact lab for submission of missing certification or certification with correct format.*

1.3 Laboratory Case Narrative: ***Yes*** [✓] *No* [ ] *N/A* [ ] *Comments:*

☐ *Narrative serves as an exception report for the project and method QA/QC performance.* ☑ *Narrative includes an explanation of each discrepancy on the Certification Statement.*

***ACTION**: If no, contact lab for submission of missing or illegible information.*

1.4 Chain of Custody (COC) copy present with all documentation completed? **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (*Cooler Receipt Form*): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

Yes [✓] No [ ] N/A [ ] Comments:

☑ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☑ Container type noted ☑ Condition observed ☑ pH verified (where applicable) ☑ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used? **Yes** [✓] No [ ] N/A [ ] Comments:

✓ Ammonia,– 1 Liter polyethylene/H_2SO_4 to pH<2,cool to 4°C

Alkalinity – 1 500mL polyethylene/cool to 4°C

Chemical Oxygen Demand – 250 mL polyethylene/H_2SO_4 to pH<2,cool to 4°C

Chloride, pH, sulfate - 1 500mL polyethylene/cool to 4°C

Organic Carbon – 500 mL amber glass bottle/HCl or H_2SO_4 to pH<2,cool to 4°C

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

✓ Specific conductance, TDS, TSS - 100 mL polyethylene/cool to 4°C

✓ TSS, TDS - 1 500mL polyethylene/cool to 4°C

✓ Hardness 1500ml Poly w/ Nitric Acid Cool 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage? **Yes** [✓] No [ ] N/A [ ] Comments:

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? Yes [ ] **No** [✓] N/A [ ] Comments:

1.6 Sample Results Section: *Was the following information supplied in the laboratory report for each sample?* **Yes** [✓] No [ ] N/A [ ] Comments:

[✓] Field ID and Lab ID [✓] Date and time collected [✓] Analyst Initials [✓] Dilution Factor [ ] % moisture or solids N/A [✓] Reporting limits
[ ] Clean-up method N/A [✓] Analysis method [✓] Preparation method [✓] Date of preparation/extraction/digestion clean-up and analysis, where applicable
[✓] Matrix [✓] Target analytes and concentrations [✓] Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch? **Yes** [✓] No [ ] N/A [ ] Comments:

[✓] Method blank results [✓] LCS recoveries [✓] MS/MSD recoveries and RPDs Hardness only [✓] Laboratory duplicate results (where applicable) Hardness only

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times Yes [ ] **No** [✓] N/A [ ] Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days Sulfide, TDS, TSS = 7 days pH = analyze immediately Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method **Yes** [✓] No [ ] N/A [ ] Comments:

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

3.2 Are the practical quantitation limits the same as those specified by the ☐ SOW ☑ QAPP ☐ Lab? **Yes** [✓] No [ ] N/A [ ] Comments:

Note: *The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP*. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.*

Ammonia* ☐ = 0.1 mg/ L	Alkalinity**☐ = 1 mg/L	Bicarbonate Alkalinity** ☐ = 1 mg/L	Carbonate Alkalinity** ☐ = 1 mg/L
Nitrate Nitrogen as N* ☑ = .05 mg/L	Nitrite Nitrogen as N* ☐ = .01 mg/L	Chloride* ☑ = 1 mg/L	Hardness *☑ = 2.64 mg/L
Spec. Cond.** ☐ 3 umhos/cm	Total Organic Carbon** ☑ = 1 mg/L	Bromide 0.2 mg/L	Sulfate (EPA 300.0)* ☑ = 2 mg/L
COD:* Low – 20 mg/L	pH* ☐ < 2 to > 12	TDS* ☐ = 10 mg/L	TSS* ☑ = 5 mg/L

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If *dilutions were required, were dilution factors reported?* **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact the lab for submission.

4.0 **<u>Method Blanks</u>** **Yes** [✓] No [ ] N/A [ ] Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs). **Yes** [✓] No [ ] N/A [ ] Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following: Yes [ ] **No** [✓] N/A [ ] Comments:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 5 × blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits? Yes [ ] **No** [✓] N/A [ ] Comments:

LCS Limits:

Alkalinity** ☐ = 80-120% Bicarbonate Alkalinity** ☐ = 80-120% Carbonate Alkalinity** ☐ = 80-120% Specific Conductivity *☐ = 80-120%

Total Organic Carbon** ☑ = 80-120% TDS** ☐ = 80-120% Ammonia Nitrogen as N* ☑ = 80-120%

COD Low* ☐ = 80-120% Nitrate Nitrogen as N**☐ = 80-120%% Nitrite Nitrogen as N** ☐= 80-120%

Hardness* ☐ = 80-120% Chloride* ☑ = 80-120% Sulfate (EPA 300.0)* ☑ = 80-120% pH* ☐ = 80-120% TSS* NA

Other parameter(list) Bromide %R = 100 & 106 ☐ Rec Limits= Lab Limits 90-110

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

Yes [ ] No [✓] N/A [ ] Comments: Not requested on Chain of Custody
↳ except on Hardness

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

Yes [ ] No [ ] N/A [✓] Comments:

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix? **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: If any matrix spike data is missing, call lab for resubmission.

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$ Where: SSR = Spiked sample result; SR = Sample result; SA = Spike added

MS/MSD Recovery Limits:

Alkalinity* = NA Bicarbonate Alkalinity* = NA Carbonate alkalinity* = NA Ammonia* (LACHAT) ☐ = 74-125%

Chloride** ☐= 75-125% Specific Conductivity * = NA Total Organic Carbon* = NA TDS** = NA

COD Low* ☐ = 75-125% Nitrate Nitrogen as N** ☐ = 75-125%

Nitrite Nitrogen as N** ☐ = 75-125% Hardness* ☐ = 75-125% Sulfate (EPA 300.0)* ☐ = 75-125% pH* = NA TSS* = NA

Other parameter(list) _____ % R = _____ ☐ Rec Limits = _____

* = Laboratory Limits ** = Olin QAPP Limits *(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)*

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where S = MS result, D = MSD result

MS/MSD RPD Limits:

Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia** (LACHAT) ☐ = 20%
Chloride**(SM 4500 Cl) ☐ = 20%	Specific Conductivity * = NA	Total Organic Carbon* = NA	TDS** = NA Total Organic Carbon* = NA
COD Low** ☐ = 20%	COD High** ☐ = 20%	Nitrate Nitrogen as N** ☐ 20%	Nitrite Nitrogen as N** ☐ = 20%
Hardness* = NA	Sulfate (EPA 300.0)* ☐ = 20%	pH* = NA	TSS* = NA

Other parameter(list) _____ RPD = _____ ☐ RPD limit = _____

Other parameter(list) _____ RPD = _____ ☐ RPD limit = _____

* = Laboratory Limits ** = Olin QAPP Limits

(*MADEP has not yet defined LCS recovery limits for wet chemistry analyses.*)

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20%? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

Hardness analyzed

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist. **Yes** [ ] No [✓] N/A [ ] Comments:

8.2 Do any rinsate blanks have positive results? Yes [ ] **No** [ ] N/A [✓] Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

NOTE: *MADEP does not require the collection of rinsate blanks.*

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates. **Yes** [ ] No [✓] N/A [ ] Comments:

9.2 Were field duplicates collected per the required frequency? **Yes** [ ] No [ ] N/A [✓] Comments:

SOW ☐ QAPP ☐ *MADEP Option 1(1 per 20)* ☐ *MADEP Option 3 (1 per 10)* ☐

9.3 Was the RPD ≤ 50% for soils or ≤30% for waters? Calculate the RPD for all results and attach to this review. **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: RPD must be ≤50% for soil or ≤30% water. Qualify data (J) for both sample results if the RPD exceeds limit.

Was any of the data qualified? Yes [ ] **No** [✓] N/A [ ] Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

REFERENCES

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

STL-Westfield, 2002. "Olin – General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: OC-SW-EDSD/SW7-XXX
Lab Sample ID: 480-27937-1
Lab Name: TestAmerica Buffalo
Job No.: 480-27937-1
SDG ID.:
Matrix: Water
Date Sampled: 11/06/2012 09:30
Reporting Basis: WET
Date Received: 11/07/2012 07:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7664-41-7	Ammonia	9.0	0.20	0.090	mg/L			10	350.1
14797-65-0	Nitrite as N	ND	0.050	0.020	mg/L		✓	1	353.2
	Hardness as calcium carbonate	140	20	5.3	mg/L			1	SM 2340C
24959-67-9	Bromide	0.18	0.20	0.073	mg/L	J		1	300.0
16887-00-6	Chloride	130	1.0	0.56	mg/L			2	300.0
14808-79-8	Sulfate	81	2.0	0.35	mg/L			1	300.0
14797-55-8	Nitrate as N	1.6	0.050	0.011	mg/L			1	353.2
7440-44-0	Total Organic Carbon	4.4	1.0	0.43	mg/L			1	SM 5310D
7440-44-0	Total Organic Carbon - Duplicates	4.4	1.0	0.43	mg/L			1	SM 5310D
	TOC Result 1	4.1	1.0	0.43	mg/L			1	SM 5310D
	TOC Result 2	4.6	1.0	0.43	mg/L		✓	1	SM 5310D

TC
2/21/13

CHEMIST REVIEW-VALIDATION CHECKLIST

Project: Olin Chemical Superfund Site
Project #: 6107130016.01.10
Date: 2/19/2013

Method: Opex/Kempore SW8000B
Laboratory and SDG: Lancaster/OLN81
Reviewer:

Chemist Review ☑ **Full Validation (add page 2)**

1. **Case Narrative and Data Package Completeness (COC Review)**

   The case narrative states that he holding time was not met, the client was notified, and the data was reported.

2. **Holding Time and Sample Preservation/Collection (aqueous 7 days to analysis)**

   Sample OC-SW-EDSD/SW7-XXX was analyzed two days beyond hold time. The reporting limits for Kempore and Opex were qualified estimated (UJ).

3. **QC Blanks**

   All non detect.

4. **Laboratory Control Sample Review (% recovery 70-130, RPD 20)**

   All criteria met.

5. **Field Duplicate Precision (RPD 30)**

   Not applicable.

6. **Lab Duplicate Precision (RPD 20)**

   LCS/LCSD RPD in criteria.

7. **Matrix Spike Results (if applicable) (% recovery 75-125, RPD 20)**

   All criteria met.

8. **Continuing Calibration (percent recovery 85 – 115)**

   Kempore CCAL percent recoveries ranged from 48 to 57 and were less than the lower QC limit of 85. Kempore reporting limits were qualified estimated (UJ).

9. **Reporting Limit and Data comparison (Opex 100 µg/L, Kempore 1000 µg/L)**

   All criteria met.

CHEMIST REVIEW-VALIDATION CHECKLIST

FULL VALIDATION CHECKS

Ten Percent of data sets will have full validation checks completed during chemist review.

☑ **Initial Calibration**

☑ **Continuing Calibration Verification**

Transcription and Calculation Checks

☑ **Instrument Calibration**

☑ **Blank Review – raw data/chromatogram check**

☑ **Laboratory Control Sample**

n/a Matrix Spike

Note: calculation checks were performed in SDG OLN80 for the OU3 GW samples, which is the same batch and QC that was performed for SDG OLN 81.

curofins | Lancaster Laboratories

Analysis Report

Sample Description: OC-SW-EDSD/SW7-XXX Grab Surface Water
Wilmington MA Superfund Site

LLI Sample # WW 6854322
LLI Group # 1348038
Account # 12670

Project Name: Olin Wilmington, MA/6107120016

Collected: 11/06/2012 09:30 by CTM

Submitted: 11/09/2012 09:20
Reported: 11/28/2012 09:19

Olin Corporation
Suite 200
3855 North Ocoee Street
Cleveland TN 37312

SW-7- SDG#: OLN81-01*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
HPLC Organics	SW-846 8000B		ug/l	ug/l	ug/l	
02727	Kempore in Water	123-77-3	N.D. J	1,000	230	1
	The holding time was not met. The client was notified and the data reported. The response for Kempore in the continuing calibration verification standard is outside the acceptance limits. The samples from this client site have been known to cause this affect on our instrumentation due to the sample matrix. The sample data is reported.					
02726	Opex in Water	101-25-7	N.D. J	100	20	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02727	Kempore in Water	SW-846 8000B	1	123190031A	11/15/2012 01:47	James H Place	1
02726	Opex in Water	SW-846 8000B	1	123180032A	11/15/2012 23:00	James H Place	1

2/19/13

*=This limit was used in the evaluation of the final result

Eurofins Lancaster Laboratories, Inc.
2425 New Holland Pike
PO Box 12425
Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

7E
CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:
Lab Code:
Case No.:
SAS No.:
SDG No.:
Instrument: K3593A
Init. Calib Date(s): 11/14/12 11/14/12
GC Column (1) : SUP-PAH ID: 4.6 (mm)
Date Analyzed: 11/14/12
Lab File ID: 1K11319.21R
Time Analyzed: 23:18
Lab Standard ID: KEMP3EY
Initial Calibration: 1K11319

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
Kempore	3.50	3.00	4.00	6732.26	9894.00	-32

Average of %D: 32

Compounds 1

68% R

FORM VII

7E
CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:
Lab Code:
Case No.:
SAS No.:
SDG No.:
Instrument: K3593A
Init. Calib Date(s): 11/14/12 11/14/12
GC Column (1) : SUP-PAH ID: 4.6 (mm)
Date Analyzed: 11/15/12
Time Analyzed: 1:15
Lab File ID: 1K11319.32R
Initial Calibration: 1K11319
Lab Standard ID: KEMP3EZ

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
Kempore	3.50	3.00	4.00	4745.80	9894.00	-52

Average of %D: 52

Compounds 1

48% R

FORM VII

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:
Lab Code:
Case No.:
SAS No.:
SDG No.:
Instrument: K3593A
Init. Calib Date(s): 11/14/12 11/14/12
GC Column (1) : SUP-PAH
ID: 4.6 (mm)
Date Analyzed: 11/15/12
Time Analyzed: 1:58
Lab File ID: 1K11319.36R
Initial Calibration: 1K11319
Lab Standard ID: KEMP3FA

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
Kempore	3.50	3.00	4.00	5464.94	9894.00	-45

Average of %D: 45

Compounds 1

55%R

FORM VII

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:
Lab Code:
Case No.:
SAS No.:
SDG No.:
Instrument: K3593A
Init. Calib Date(s): 11/16/12 11/16/12
GC Column (1) : SUP-PAH
ID: 4.6 (mm)
Date Analyzed: 11/16/12
Lab File ID: 1K11321.20R
Time Analyzed: 19:01
Lab Standard ID: KEMP3EY
Initial Calibration: 1K11321

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
Kempore	3.19	3.04	3.34	6689.27	9894.00	-32

Compounds 1
Average of %D: 32

68% R.

FORM VII

7E
CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:
Lab Code: Case No.: SAS No.: SDG No.:
Instrument: K3593A Init. Calib Date(s): 11/16/12 11/16/12
GC Column (1) : SUP-PAH ID: 4.6 (mm) Date Analyzed: 11/16/12
Lab File ID: 1K11321.31R Time Analyzed: 20:58
Lab Standard ID: KEMP3EZ Initial Calibration: 1K11321

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT	NOM AMOUNT	%D
Kempore	3.19	3.04	3.34	5603.22	9894.00	-43

Compounds 1 Average of %D: 43

5%R

FORM VII

7E
CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:
Lab Code:
Case No.:
SAS No.:
SDG No.:
Instrument: K3593A
Init. Calib Date(s): 11/16/12 11/16/12
GC Column (1) : SUP-PAH ID: 4.6 (mm)
Date Analyzed: 11/16/12
Lab File ID: 1K11321.35R
Time Analyzed: 21:41
Lab Standard ID: KEMP3FA
Initial Calibration: 1K11321

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
Kempore	3.19	3.04	3.34	5152.02	9894.00	-48

Compounds 1
Average of %D: 48

52 % R

FORM VII

8D
ANALYTICAL SEQUENCE

Sequence: 1K11319 Lab Name: Lancaster laboratories Contract:

Lab Code: Case No.: SAS No: SDG No.:

GC Column: SUP-PAH ID: 4.6

Instrument: K3593A

THIS ANALYTICAL SEQUENCE OF BLANKS, SAMPLES AND STANDARDS IS GIVEN BELOW:

	Sample Code No.	Lab Sample ID	Date Analyzed	Time Analyzed	Calibration File	
001		CONDITIONER	11/14/2012	19:45:13	1K11319	
002		CONDITIONER	11/14/2012	19:56:07	1K11319	
003		CONDITIONER	11/14/2012	20:06:59	1K11319	
004		CONDITIONER	11/14/2012	20:17:37	1K11319	
005	KEMP5AA	KEMP51224C	11/14/2012	20:28:15	1K11319	
006	KEMP4AA	KEMP41224C	11/14/2012	20:38:52	1K11319	
007	KEMP3AA	KEMP31224C	11/14/2012	20:49:30	1K11319	
008	KEMP2AA	KEMP21224C	11/14/2012	21:00:07	1K11319	
009	KEMP1AA	KEMP11224C	11/14/2012	21:10:45	1K11319	
010	MDKRXAA	MDKRX1224C	11/14/2012	21:21:22	1K11319	
011	PBLK31319	BLANKA	11/14/2012	21:32:00	1K11319	
012	LCS31319	LCSA	11/14/2012	21:42:37	1K11319	
013	LCSD31319	LCSDA	11/14/2012	21:53:14	1K11319	
014	PBLK32319	BLANKA	11/14/2012	22:03:52	1K11319	
015		MDL1	11/14/2012	22:14:29	1K11319	
016		MDL2	11/14/2012	22:25:07	1K11319	
017		MDL3	11/14/2012	22:35:44	1K11319	
018		MDL4	11/14/2012	22:46:22	1K11319	
019		MDL5	11/14/2012	22:56:59	1K11319	
020		MDL6	11/14/2012	23:07:36	1K11319	
021	KEMP3EY	KEMP31224C	11/14/2012	23:18:14	1K11319	682R
022		MDL7	11/14/2012	23:28:52	1K11319	
023	404S1	6854278	11/14/2012	23:39:29	1K11319	
024	404M1	6854279	11/14/2012	23:50:07	1K11319	
025	400BR	6854280	11/15/2012	00:01:23	1K11319	
026	400D1	6854281	11/15/2012	00:12:00	1K11319	
027	404BR	6854282	11/15/2012	00:22:38	1K11319	
028	400D2	6854283	11/15/2012	00:33:16	1K11319	
029	404S2	6854284	11/15/2012	00:43:53	1K11319	
030	404M2	6854285	11/15/2012	00:54:30	1K11319	
031	404M2	6854286	11/15/2012	01:05:08	1K11319	
032	KEMP3EZ	KEMP31224C	11/15/2012	01:15:45	1K11319	482R
033	404M2	6854287	11/15/2012	01:26:23	1K11319	

8D
ANALYTICAL SEQUENCE

Sequence: 1K11319 Lab Name: Lancaster laboratories Contract:

Lab Code: Case No.: SAS No: SDG No.:

GC Column: SUP-PAH ID: 4.6

Instrument: K3593A

THIS ANALYTICAL SEQUENCE OF BLANKS, SAMPLES AND STANDARDS IS GIVEN BELOW:

	Sample Code No.	Lab Sample ID	Date Analyzed	Time Analyzed	Calibration File
034	404MD	6854289	11/15/2012	01:37:00	1K11319
035	SW-7-	6854322	11/15/2012	01:47:38	1K11319
036	KEMP3FA	KEMP31224C	11/15/2012	01:58:15	1K11319

552 n

8D
ANALYTICAL SEQUENCE

Sequence: 1K11321 Lab Name: Lancaster laboratories Contract:

Lab Code: Case No.: SAS No: SDG No.:

GC Column: SUP-PAH ID: 4.6

Instrument: K3593A

THIS ANALYTICAL SEQUENCE OF BLANKS, SAMPLES AND STANDARDS IS GIVEN BELOW:

	Sample Code No.	Lab Sample ID	Date Analyzed	Time Analyzed	Calibration File	
001		CONDITIONER	11/16/2012	15:39:36	1K11321	
002		CONDITIONER	11/16/2012	15:50:13	1K11321	
003		CONDITIONER	11/16/2012	16:00:50	1K11321	
004	KEMP5AA	KEMP51224C	11/16/2012	16:11:27	1K11321	
005	KEMP4AA	KEMP41224C	11/16/2012	16:22:04	1K11321	
006	KEMP3AA	KEMP31224C	11/16/2012	16:32:42	1K11321	
007	KEMP2AA	KEMP21224C	11/16/2012	16:43:18	1K11321	
008	KEMP1AA	KEMP11224C	11/16/2012	16:53:56	1K11321	
009	MDKRXAA	MDKRX1224C	11/16/2012	17:04:33	1K11321	
010	PBLK31319	BLANKA	11/16/2012	17:15:10	1K11321	
011	LCS31319	LCSA	11/16/2012	17:25:47	1K11321	
012	LCSD31319	LCSDA	11/16/2012	17:36:24	1K11321	
013	PBLK32319	BLANKA	11/16/2012	17:47:02	1K11321	
014		MDL1	11/16/2012	17:57:39	1K11321	
015		MDL2	11/16/2012	18:08:16	1K11321	
016		MDL3	11/16/2012	18:18:53	1K11321	
017		MDL4	11/16/2012	18:29:30	1K11321	
018		MDL5	11/16/2012	18:40:08	1K11321	
019		MDL6	11/16/2012	18:50:45	1K11321	
020	KEMP3EY	KEMP31224C	11/16/2012	19:01:22	1K11321	68% R
021		MDL7	11/16/2012	19:11:59	1K11321	
022	404S1	6854278	11/16/2012	19:22:36	1K11321	
023	404M1	6854279	11/16/2012	19:33:13	1K11321	
024	400BR	6854280	11/16/2012	19:43:51	1K11321	
025	400D1	6854281	11/16/2012	19:55:06	1K11321	
026	404BR	6854282	11/16/2012	20:05:44	1K11321	
027	400D2	6854283	11/16/2012	20:16:21	1K11321	
028	404S2	6854284	11/16/2012	20:26:58	1K11321	
029	404M2	6854285	11/16/2012	20:37:35	1K11321	
030	404M2	6854286	11/16/2012	20:48:12	1K11321	
031	KEMP3EZ	KEMP31224C	11/16/2012	20:58:49	1K11321	57% R
032	404M2	6854287	11/16/2012	21:09:27	1K11321	
033	404MD	6854289	11/16/2012	21:20:04	1K11321	

8D
ANALYTICAL SEQUENCE

Sequence: 1K11321 Lab Name: Lancaster laboratories Contract:

Lab Code: Case No.: SAS No: SDG No.:

GC Column: SUP-PAH ID: 4.6

Instrument: K3593A

THIS ANALYTICAL SEQUENCE OF BLANKS, SAMPLES AND STANDARDS IS GIVEN BELOW:

	Sample Code No.	Lab Sample ID	Date Analyzed	Time Analyzed	Calibration File
034	SW-7-	6854322	11/16/2012	21:30:41	1K11321
035	KEMP3FA	KEMP31224C	11/16/2012	21:41:18	1K11321

5 2 n

OLIN-WILMINGTON
CHEMIST REVIEW
STANDARD OPERATING PROCEDURE AND CHECKLIST
N-NITROSODIMETHYLAMINE (NDMA) AND
N-NITROSODI-N-PROPYLAMINE (NDPA) BY METHOD 521

Reviewer/Date Tige Cunningham 2/20/13
Sr. Review/Date
Lab Report # 480-27937-1
Project # 6107130016-10

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Check items received. **Yes** [✓] No [ ] N/A [ ] Comments:

☑ *Name of Laboratory* ☑ *Address* ☑ *Project ID* ☑ *Phone #* ☑ *Sample identification – Field and Laboratory (IDs must be cross-referenced)*

Client Information: ☑ *Name* ☑ *Address* ☑ *Client Contact*

☑ Data Package Narrative ☑ results and QC summaries ☑ raw data ☑ chromatograms

ACTION: If no, contact lab for submission of missing or illegible information.

1.1 Laboratory Case Narrative: ***Yes*** [✓] *No* [ ] *N/A* [ ] *Comments:*

☑ *Narrative serves as an exception report for the project and method QA/QC performance.*

***ACTION**: If no, contact lab for submission of missing or illegible information.*

1.2 Chain of Custody (COC) copy present of completed COC? **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include a copy of the completed Chain of Custody forms containing all samples in this SDG?

ACTION: If no, contact lab for submission of missing completed *COC*.

1.3 Sample Receipt Information (*Cooler Receipt Form*): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory? **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☑ Container type noted ☑ Condition observed ☑ Field and lab IDs cross referenced documentation. **ACTION**: If no, contact lab for submission of missing or incomplete

1.3.1 Were the correct bottles and preservatives used? **Yes** [✓] No [ ] N/A [ ] Comments:

Water - 1 Liter amber bottle cool to 4°C. Sodium thiosulfate may be added if source is chlorinated.

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) if cooler temperature exceeds 10°C or use professional judgment for data rejection.

1.3.2 Were all samples delivered to the laboratory without breakage? **Yes** [✓] No [ ] N/A [ ] Comments:

1.3.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? Yes [ ] **No** [✓] N/A [ ] Comments:

1.4 Sample Results Section: *Was the following information supplied in the laboratory report for each sample?* **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Field ID and Lab ID ☑ *Date and time collected* ☑ Analyst Initials ☑ *Dilution Factor* ☑ *Reporting limits*
☑ Analysis method ☑ *Preparation method* ☑ *Date of preparation/extraction/ and analysis,* ☑ Matrix ☑ Target analytes and concentrations ☑ Units

ACTION: If no, contact lab for submission of missing or incomplete information.

1.5 QA/QC Information: Was the following information provided in the laboratory report for each sample batch?

Yes [✓] No [ ] Comments:

☑ Method blank results ☑ LCS recoveries ☐ MS/MSD recoveries and RPDs (N/A) ☑ Internal Standard Recoveries

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 <u>Holding Times</u> Yes [ ] **No** [✓] N/A [ ] Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded?

NOTE: For water samples, the holding time is 7 days from sampling to extraction and 40 days from extraction to analysis.

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. For soil samples professional judgement will be used to determine if rejection is necessary.

3.0 Laboratory Method Yes [✓] No [ ] N/A [ ] Comments:

3.1 Was the correct laboratory method used?

Water Extraction 3510C or *3520C*
NDMA and NDPA 521

Isotope Dilution by Method GC/CI/MS/MS

ACTION: If no, contact project manager to inform Client of change; request variance from Client; contact laboratory to provide justification for method change compared to the requested method.

3.2 Are the practical quantitation limits the same as those specified by the ☑ QAPP Yes [✓] No [ ] N/A [ ] Comments:

NOTE: *The project PQL is 2 ng/L for GW and 5 ng/L for SW.*

Surface Water reported @ 2 ng/L

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

FORM VI
LCMS INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica West Sacramento Job No.: 480-27937-1 Analy Batch No.: 5732

SDG No.:

Instrument ID: IT1 GC Column: VF-624MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/03/2012 17:39 Calibration End Date: 11/04/2012 00:39 Calibration ID: 1564

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD01 320-5732/4	CS-1...1.0pg-uL,
Level 2	STD02 320-5732/5	CS-2...2.0pg-uL,
Level 3	STD03 320-5732/6	CS-3...5.0pg-uL,
Level 4	STD04 320-5732/7	CS-4...10pg-uL,
Level 5	STD05 320-5732/8	CS-5...20pg-uL,
Level 6	STD06 320-5732/9	CS-6...50pg-uL,
Level 7	STD07 320-5732/10	CS-7...100pg-uL,
Level 8	STD08 320-5732/11	CS-8...200pg-uL,

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5		B	M1	M2								
N-Nitrosodimethylamine	2798.0 5059.3	3116.5 5203.3	4104.0 5297.1	4019.3	4928.7	Q2ID	-0.808	2.0900	0.0024						0.9940		0.9900
N-Nitrosomethylethylamine	4817.0 5784.0	4648.0 5582.2	4818.8 5870.3	5161.8	5470.1	AveID		2.4715				8.3		30.0			
N-Nitrosodiethylamine	2518.0 1971.1	2211.0 1836.8	2166.8 1799.1	2248.6	2214.1	AveID		0.9987				14.0		30.0			
N-Nitrosodi-n-propylamine	7052.0 5896.3	5618.5 5246.6	6401.4 5171.6	5448.3	6110.3	L2ID	0.1327	1.3087							0.9980		0.9900
N-Nitrosopyrrolidine	9342.0 6972.8	7889.0 6257.0	7044.8 5822.9	7366.1	7833.2	AveID		1.6692				10.0		30.0			
N-Nitrosopiperidine	14417 12981	11576 12491	13292 12680	12728	12236	AveID		2.9351				6.6		30.0			
N-Nitrosodi-n-butylamine	7715.0 4925.7	5508.0 4488.3	5885.6 4127.2	5563.4	5418.2	AveID		1.2416				15.0		30.0			
N-Nitrosodimethylamine-d6	0.2190 0.2614	0.2200 0.2335	0.2548 0.2338	0.2282	0.2276	Ave		0.2348				6.6		40.0			
N-Nitrosodi-n-propylamine-d14	0.5219 0.4743	0.4674 0.4695	0.5093 0.4402	0.4516	0.5100	Ave		0.4805				6.2		40.0			

TC 2/20/13

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

%RSD %RSD

3.3 Did the laboratory complete a mulit-point initial calibration with a NDMA ~~RPD~~ ≤ 20? Is NDPA ~~RPD~~ ≤ 30? Is the low point standard equal to the PQL? Yes, 1ng/L standard analyzed — **Yes** [ ] No [✓] — Comments: NDMA % RSD = 22.4 Initial Calibration was performed by Quadratic regression, w/ a R^2 of 0.994 Sample Qualified UJ See attached Excel Sheet NDPA was OK

Has a second source standard been analyzed to verify initial calibration? Is the percent difference < 25? — **Yes** [✓] No [ ]

3.4 Did the laboratory analyze a continuing calibration every 12 hours or every 20 samples? Was the NDMA recovery 80-120 percent (percent difference ≤ 20)? Was the NDPA recovery 70 -130 percent (percent difference ≤ 30)? — **Yes** [✓] No [ ]

3.5 Is the RRT in the CCAL ± 0.06 min from ICAL? — **Yes** [✓] No [ ] N/A [ ] — Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present? — **Yes** [✓] No [ ] N/A [ ] — Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 For the analysis of NDMA, has a method blank been analyzed for each analysis batch of field samples of 20 or less? — **Yes** [✓] No [ ] N/A [ ] — Comments:

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

Olin Level I
Calculations
NDMA SDG 480-27937-1
OU2 SW
Olin

	RRF										
Analyte	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	**Ave.**	**%SD**	**%RSD**
NDMA	2798	3116	4101	4019	4928	5059	5203	5297	4315.125	96765.4	22.4
NDMA-d6	0.219	0.22	0.2548	0.2282	0.2276	0.2614	0.2335	0.2338	0.234788	1.5	6.6
NDPA	7052	5618	6401	5448	6110	5896	5246	5171	5867.75	63884.8	10.9
NDPA-d14	0.5219	0.4674	0.5093	0.4516	0.51	0.4743	0.4695	0.4402	0.480525	3.0	6.2

4.3 Is the method blank less than the PQL?

Yes [ ] No [✓] N/A [ ] Comments:

4.4 Do any method blanks have positive results for NDMA parameters? Qualify data according to the following:

Yes [✓] **No** [ ] N/A [ ] Comments:

NDMA @ 0.42J no hit in sample
no Quals

For NDMA contaminants:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

5.0 Laboratory Control Sample

5.1 Was a laboratory control sample extracted and run with each analytical batch of 20 samples or less?

Yes [✓] No [ ] N/A [ ] Comments:

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgment to determine the usability of sample results associated with that batch.

5.2 Is a LCS Summary Form present?

Yes [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of control limits? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: QAPP LCS recovery limits 60-140.

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit but > 10%, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project specified MS/MSDs analyzed? List project samples that were spiked. **Yes** [ ] No [✓] N/A [ ] Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the MS/MSD recovery form present? **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: If no, contact lab for resubmission of missing data.

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix? **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.4 Are any NDMA spike recoveries outside of the QC limits? Yes [ ] No [ ] N/A [✓] Comments:

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$

Where: SSR = Spiked sample result SA = Spike added
SR = Sample result

NOTE: *QAPP MS/MSD recovery limits are 60-140.*
NOTES: 1) Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: Professional judgment used to qualify associated samples. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify both positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where: S = MS sample result
D = MSD sample result

NOTE: *QAPP MS/MSD RPD limits for water ≤ 20.*

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Isotope IS Recoveries

Were internal recoveries outside of laboratory limits for any sample or method blank? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: *Lab IS recovery limits 25 -150.*

ACTION: If recoveries are <10% and sample extracts were not diluted, reject non-detects and qualify positive detections as estimated (J). For recoveries outside the lab QC limit, qualify non-detects and positives (J).

8.0 Sampling Accuracy

If ground water samples are collected directly from a tap, process stream, or with dedicated tubing, rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples. **Yes** [ ] No [✓] N/A [ ] Comments:

8.2 Do any rinsate blanks have positive results? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of the samples and their associated field duplicates. **Yes** [ ] No [✓] N/A [ ] Comments:

9.2 Was the RPD ≤ 30% for waters? Calculate the RPD for all results and attach to this review. **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: RPD must be ≤30% for water. Qualify data (J) for both sample results if the RPD exceeds 30%.

10.0 Calculation and Transcription Checks

- [✓] Initial Calibration See Attached Excel
- [✓] Continuing Calibration
- [✓] Method Blank Raw Data Reveiw
- [✓] Sample NDMA and NDPA Results
- [✓] LCS
- [✓] Internal Standard Recovery

REFERENCES

MACTEC, 2009, "Project Operation Plan Volume III-B Quality Assurance Project Plan, Olin Wilmington Superfund Site, 51 Eames Street, Wilmington, MA", April 2009.

U.S. Environmental Protection Agency (USEPA), 1996. "Region 1 EPA-NE Data Validation Guidelines For Evaluating Environmental Analyses"; Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December 1996.

Report Date: 26-Nov-2012 15:52:09 Chrom Revision: 2.1 14-Nov-2012 09:16:24

TestAmerica West Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121116-1439.b\CS-6...50pg-uL, 11-16-2012, 2-52-54 PM.d		
Lims ID:	CCV	Client ID:	
Inject. Date:	16-Nov-2012 14:52:55	Dil. Factor:	1.0000
Sample Type:	CCV		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	6058	Lims Sample ID:	2
Sublist:	chrom-NDMA_IT1*sub1		
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20121116-1439.b\NDMA_IT1.m		
Last Update:	26-Nov-2012 15:52:09	Calib Date:	04-Nov-2012 00:39:08
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121112-1351.b\CS-8...200pg-uL, 11-4-2012, 12-39-07 AM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	CORPXA45-031		

First Level Reviewer: nihartv Date: 16-Nov-2012 15:52:22

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.383	12.383	0.0	71	256227	110.5	100.0- 100.0	100.0		
81	12.350	12.383	-0.033		157563		69.4- 69.4	61.5		
2 N-Nitrosodimethylamine										
43	12.435	12.435	0.0	77	155023		100.0- 100.0	100.0	676	
47	12.435	12.435	0.0		107294		65.2- 65.2	69.2		
	Summary Peak				262317	46.8				
3 N-Nitrosomethylethylamine										
61	14.583	14.583	0.0	77	301630	47.6			27554	
4 N-Nitrosodiethylamine										
75	16.456	16.456	0.0	51	123540	48.3			Infinity	
* 5 2-Chloropyridine										
110	17.120	17.120	0.0	83	1975248	200.0	100.0- 100.0	100.0		
116	17.120	17.120	0.0		1528259		71.9- 71.9	77.4		
D 6 N-Nitrosodi-n-propylamine-d14										
97	21.066	21.066	0.0	66	469065	98.8				
7 N-Nitrosodi-n-propylamine										
89	21.271	21.271	0.0	65	321167	52.2			1024	
8 N-Nitrosopyrrolidine										
55	22.001	22.001	0.0	64	393295	50.2			Infinity	
9 N-Nitrosopiperidine										
68	22.976	22.976	0.0	56	787030	57.2			1476	

CCV check

$\frac{46.8}{50} - 1 = 6.4\%$ ✓

TC 2/20/13

Report Date: 26-Nov-2012 15:52:08 Chrom Revision: 2.1 14-Nov-2012 09:16:24

TestAmerica West Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121116-1439.b\ccv, 11-17-2012, 1-20-29 AM.d		
Lims ID:	CCV	Client ID:	
Inject. Date:	17-Nov-2012 01:20:30	Dil. Factor:	1.0000
Sample Type:	CCV		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	6058	Lims Sample ID:	13
Sublist:	chrom-NDMA_IT1*sub1		
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20121116-1439.b\NDMA_IT1.m		
Last Update:	26-Nov-2012 15:52:08	Calib Date:	04-Nov-2012 00:39:08
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121112-1351.b\CS-8...200pg-uL, 11-4-2012, 12-39-07 AM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	CORPXA45-031		

First Level Reviewer: nihartv Date: 19-Nov-2012 13:04:02

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.379	12.379	0.0	83	350868	115.6	100.0- 100.0	100.0		
81	12.362	12.379	-0.017		222230		69.4- 69.4	63.3		
2 N-Nitrosodimethylamine										
43	12.431	12.431	0.0	1	225902		100.0- 100.0	100.0	355	
47	12.440	12.431	0.009		158509		65.2- 65.2	70.2		
	Summary Peak				384411	49.9				
3 N-Nitrosomethylethylamine										
61	14.575	14.575	0.0	74	409369	47.2			40578	
4 N-Nitrosodiethylamine										
75	16.450	16.450	0.0	34	147760	42.2			738	
* 5 2-Chloropyridine										
110	17.112	17.112	0.0	78	2584617	200.0	100.0- 100.0	100.0		
116	17.112	17.112	0.0		1986022		71.9- 71.9	76.8		
D 6 N-Nitrosodi-n-propylamine-d14										
97	21.069	21.069	0.0	82	520995	83.9				
7 N-Nitrosodi-n-propylamine										
89	21.273	21.273	0.0	60	374123	54.8			937	
8 N-Nitrosopyrrolidine										
55	22.004	22.004	0.0	42	439296	50.5			Infinity	
9 N-Nitrosopiperidine										
68	22.978	22.978	0.0	51	863618	56.5			686	

CCV
NDMA
Cal Check

$\frac{49.9}{50} = -0.2\%$

TC
2/20/13

Report Date: 19-Nov-2012 14:02:29 Chrom Revision: 2.1 14-Nov-2012 09:16:24

TestAmerica West Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121116-1439.b\mb 320-5798-1-a, 11-16-2012, 4-42-46 PM.d		
Lims ID:	MB 320-5798/1-A	Client ID:	
Inject. Date:	16-Nov-2012 16:42:47	Dil. Factor:	1.0000
Sample Type:	MB		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	6058	Lims Sample ID:	4
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20121116-1439.b\NDMA_IT1.m		
Last Update:	19-Nov-2012 14:02:28	Calib Date:	04-Nov-2012 00:39:08
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121112-1351.b\CS-8...200pg-uL, 11-4-2012, 12-39-07 AM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	CORPXA45-033		

First Level Reviewer: nihartv Date: 19-Nov-2012 13:07:03

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.400	12.383	0.017	65	270614	101.8	100.0- 100.0	100.0		
81	12.383	12.383	0.0		25241		69.4- 69.4	9.3		
2 N-Nitrosodimethylamine										M
43	12.435	12.435	0.0	1	1205		100.0- 100.0	100.0	4.6	
47	12.453	12.435	0.018		122		65.2- 65.2	10.1		M
	Summary Peak				1327	0.8549				
* 5 2-Chloropyridine										s
110	17.105	17.120	-0.015	78	4529893	400.0	100.0- 100.0	100.0		
116	17.096	17.120	-0.024		3426043		71.9- 71.9	75.6		
D 6 N-Nitrosodi-n-propylamine-d14										
97	21.062	21.066	-0.004	71	805156	148.0				
7 N-Nitrosodi-n-propylamine										
89	21.053	21.271	-0.218	1	4579	0.7677			189	
8 N-Nitrosopyrrolidine										
55	22.009	22.001	0.008	44	20571	3.06			Infinity	
9 N-Nitrosopiperidine										
68	22.967	22.976	-0.009	30	9250	0.7828			41.2	

$$\frac{0.8549\,ng}{mL} \times \frac{.5\,mL}{1\,L} = .43\,ppt$$

TC
2/20/13

Report Date: 19-Nov-2012 14:02:29 Chrom Revision: 2.1 14-Nov-2012 09:16:24

TestAmerica West Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121116-1439.b\ccb, 11-16-2012, 3-47-53 PM.d		
Lims ID:	CCB	Client ID:	
Inject. Date:	16-Nov-2012 15:47:54	Dil. Factor:	1.0000
Sample Type:	CCB		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	6058	Lims Sample ID:	3
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20121116-1439.b\NDMA_IT1.m		
Last Update:	19-Nov-2012 14:02:28	Calib Date:	04-Nov-2012 00:39:08
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121112-1351.b\CS-8...200pg-uL, 11-4-2012, 12-39-07 AM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	CORPXA45-033		

First Level Reviewer: nihartv Date: 16-Nov-2012 18:24:38

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
8 N-Nitrosopyrrolidine										
55	22.064	22.001	0.063	23	1673	0			Infinity	

Cont. Cal Blank
ND

TC
2/20/13

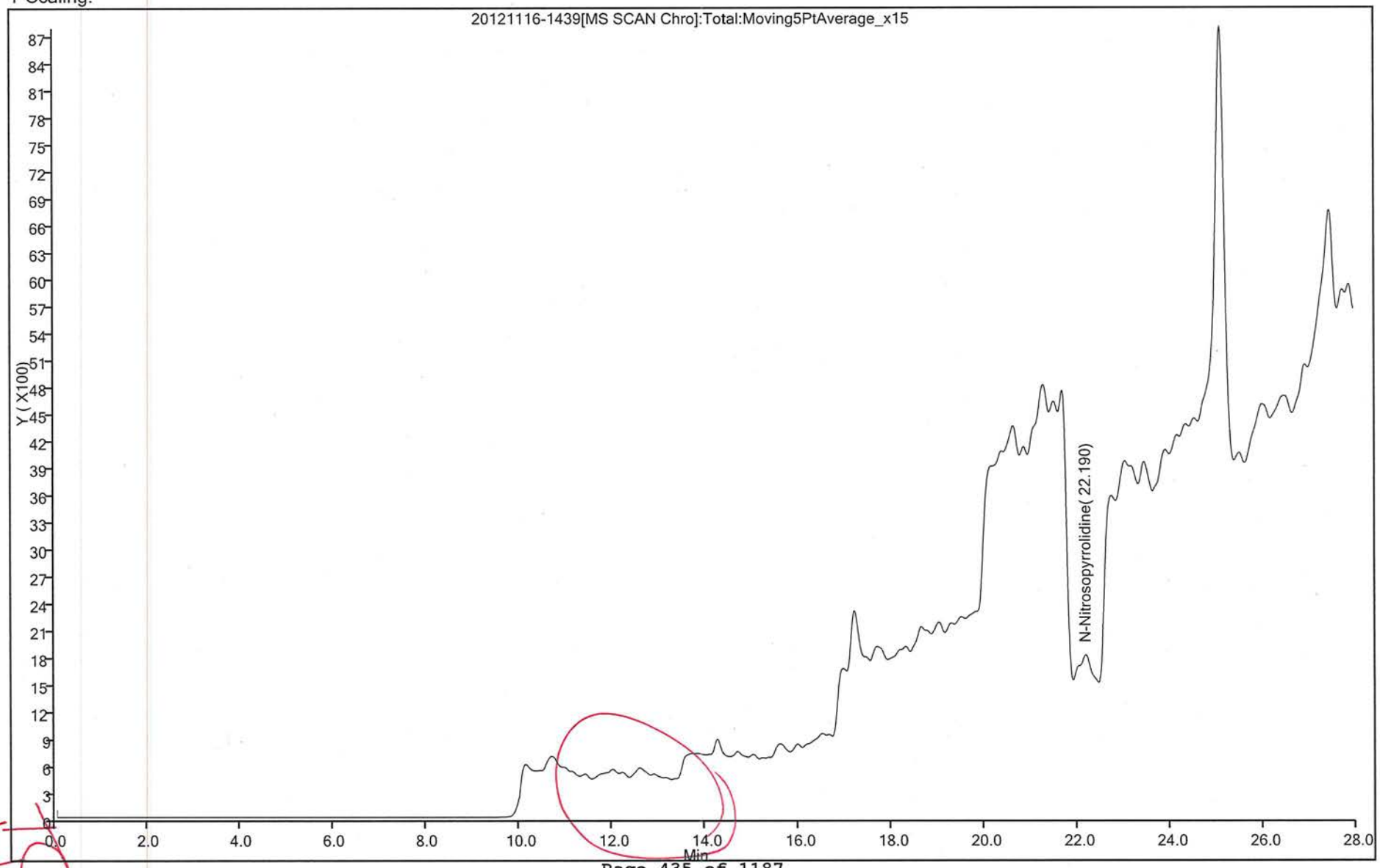
Report Date: 19-Nov-2012 14:02:38 Chrom Revision: 2.1 14-Nov-2012 09:16:24

TestAmerica West Sacramento

Data File: \\SACCHROM\ChromData\IT1\20121116-1439.b\ccb, 11-17-2012, 8-59-15 AM.d

Injection Date:	17-Nov-2012 08:59:16	Limit Group:	MSS - NDMA_CIMSMS - ICAL
Client ID:		Instrument ID:	IT1
Lims Batch ID:	6058	Lims Sample ID:	21
Operator ID:		Injection Vol:	20.0 ul
Column Type:	VF-624MS	Column Dia:	0.25 mm

Y Scaling:



2/28/13

Report Date: 19-Nov-2012 14:02:30 Chrom Revision: 2.1 14-Nov-2012 09:16:24

TestAmerica West Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121116-1439.b\lcs 320-5798-2-a, 11-16-2012, 5-38-32 PM.d		
Lims ID:	LCS 320-5798/2-A	Client ID:	
Inject. Date:	16-Nov-2012 17:38:33	Dil. Factor:	1.0000
Sample Type:	LCS		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	6058	Lims Sample ID:	5
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20121116-1439.b\NDMA_IT1.m		
Last Update:	19-Nov-2012 14:02:28	Calib Date:	04-Nov-2012 00:39:08
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121112-1351.b\CS-8...200pg-uL, 11-4-2012, 12-39-07 AM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	CORPXA45-033		

First Level Reviewer: nihartv Date: 16-Nov-2012 18:50:10

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.397	12.383	0.014	53	292835	110.6	100.0- 100.0	100.0		
81	12.380	12.383	-0.003		25653		69.4- 69.4	8.8		
2 N-Nitrosodimethylamine										
43	12.449	12.435	0.014	1	77162		100.0- 100.0	100.0	90.5	
47	12.449	12.435	0.014		61238		65.2- 65.2	79.4		
	Summary Peak				138400	43.4				
3 N-Nitrosomethylethylamine										
61	14.562	14.583	-0.021	80	158787	43.9			Infinity	
4 N-Nitrosodiethylamine										
75	16.445	16.456	-0.011	37	94476	64.6			695	
* 5 2-Chloropyridine										s
110	17.110	17.120	-0.010	78	4512588	400.0	100.0- 100.0	100.0		
116	17.110	17.120	-0.010		3449128		71.9- 71.9	76.4		
D 6 N-Nitrosodi-n-propylamine-d14										
97	21.071	21.066	0.005	69	737057	136.0				
7 N-Nitrosodi-n-propylamine										
89	21.276	21.271	0.005	8	189837	39.3			239	
8 N-Nitrosopyrrolidine										
55	22.011	22.001	0.010	61	208201	33.8			Infinity	
9 N-Nitrosopiperidine										
68	22.977	22.976	0.001	44	402657	37.2			2494	
10 N-Nitrosodi-n-butylamine										
57	26.411	26.398	0.013	56	25995		100.0- 100.0	100.0	Infinity	
103	26.411	26.398	0.013		135525		730.9- 730.9	521.4		
	Summary Peak				161520	35.3				

LCS

$\frac{43.4\,mg}{L} \times \frac{.5\,mL}{1L} = \frac{21.7}{20} = 109\%$

TC
2/20/13

(1) Sediment Sample

VOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / (II) / III (circle one)

SITE: Olin Chemical Project #: 6107130016-10 SDG #: 480-27959-1

LAB #: TAL-buffalo

Sample IDs: Attached tracking sheet OC-SD-EDSD/SW2-XXX

This checklist is designed to be used with USEPA Region I Validation Guidelines Part II (12/1996). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO	NA		
			Data completeness	
☑	☐	☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑	☐	☐	Data summaries match EDD	
			Holding Times and Preservation	
☑	☐	☐	Hold times met (14 days with preservation)	
☑	☐	☐	Preserved (waters HCL, soils methanol)	
			Instrument Performance Check (Tune)	
☑	☐	☐	Tune available for each 12-hour period samples were analyzed	
☑	☐	☐	Appropriate number of significant figures reported (at least 2)	
☑	☐	☐	Mass/Charge list (m/z) criteria met	
			Initial Calibration	
☑	☐	☐	%RSD less than or equal to 30%	
* ☐	☑	☐	RRF greater than or equal to 0.05 →	1,4-Dioxane RRF = 0.0127
			Continuing Calibration	
☑	☐	☐	%D less than or equal to 25%	
* ☐	☑	☐	RRF greater than or equal to 0.05.	1,4 Dioxane
			Blank Contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.
☑	☐	☐	Method blank contamination →	naphthalene @ 1.59 J no hits in sample no Quals
☐	☐	☑	Trip blank contamination	
☐	☐	☑	Equipment/Rinseate blank contamination	
			Trip and Rinseate blank not collected	

VOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / (II) / III (circle one)

Yes	No	N/A		
Surrogate Recoveries				
☑	☐	☐	Surrogates percent recovery criteria met (water and soil: 70%-130%)	
Matrix Spikes and Laboratory Control Samples				
☐	☐	☑	MS/MSD percent recovery criteria met (water and soil: 70%-130%)	No ms/msd submitted
☐	☐	☑	MS/MSD RPD criteria met (water and soil <30%)	
☑	☐	☐	LCS percent recovery criteria (water and soil: 70%-130%)	
Field Duplicates				
☐	☐	☑	RPD criteria (water <30%, soils <50%) met	not submitted
Internal Standard				
☑	☐	☐	Area counts within -50 to +100 percent of calib. std.	
☑	☐	☐	Retention Time within 30 seconds of calib. std.	
Target Compounds				
☑	☐	☐	Reviewed narrative for anomalies	
Tentatively Identified Compounds (TICs)				
☐	☑	☐	TCL compounds reported as TICs	Siloxane removed from data set as common lab contaminant

Validator's Signature: [signature]

Date: 2/21/13

Reference:

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1 Analy Batch No.: 89171

SDG No.:

Instrument ID: HP5973F GC Column: ZB-624 (60) ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/06/2012 14:45 Calibration End Date: 11/06/2012 17:18 Calibration ID: 11107

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD8 480-89171/9	F3292.D
Level 2	STD9 480-89171/10	F3293.D
Level 3	STD10 480-89171/11	F3294.D
Level 4	STD11 480-89171/12	F3295.D
Level 5	STD12 480-89171/13	F3296.D
Level 6	STD13 480-89171/14	F3297.D
Level 7	STD14 480-89171/15	F3298.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Ethyl ether	0.3301 0.3493	0.3522 0.3108	0.3961	0.4047	0.3810	Ave		0.3606				9.6		15.0			
3-Chloro-1-propene	2.3750 0.9278	1.0808 0.8995	1.0330	1.0188	0.9577	Lin1	2.6455	0.8880							0.9950		0.9900
2-Methyl-2-propanol	0.0691 0.0762	0.0719 0.0840	0.0769	0.0886	0.0805	Ave		0.0762				8.7		15.0			
Halothane	0.1600 0.2337	0.1999 0.2233	0.2343	0.2251	0.2382	Ave		0.2164				13.0		15.0			
Isopropyl ether	1.7934 1.9090	1.7978 1.8631	2.0501	2.1237	2.0400	Ave		1.9396				6.8		15.0			
Tert-butyl ethyl ether	1.5192 1.4479	1.4577 1.4247	1.5416	1.5256	1.5005	Ave		1.4882				3.0		15.0			
Propionitrile	0.0839 0.0958	0.0891 0.1012	0.0965	0.1089	0.1021	Ave		0.0968				8.7		15.0			
Tert-amyl methyl ether	0.9976 0.9942	1.0000 0.9717	1.0371	1.0552	1.0387	Ave		1.0135				3.0		15.0			
n-Heptane	0.9200 1.0106	0.8636 0.9870	1.0100	0.9766	1.0524	Ave		0.9743				6.5		15.0			
2,4,4-Trimethyl-1-pentene	0.4683 0.5799	0.4931 0.5723	0.4874	0.5878	0.5863	Ave		0.5393				9.9		15.0			
2,4,4-Trimethyl-2-pentene	0.4611 0.7966	0.6471 0.8067	0.7726	0.7260	0.7297	Lin1	-0.841	0.8000							0.9990		0.9900
1,4-Dioxane	0.0101 0.0123	0.0113 0.0140	0.0127	0.0146	0.0136	Ave		0.0127				13.0		15.0			
2-Nitropropane	0.3400 0.3823	0.3156 0.4282	0.3433	0.4108	0.3992	Ave		0.3742				11.0		15.0			

TC 2/21/13

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

SDG No.:

Lab Sample ID: CCV 480-90065/4 Calibration Date: 11/09/2012 22:36

Instrument ID: HP5973F Calib Start Date: 11/06/2012 14:45

GC Column: ZB-624 (60) ID: 0.25(mm) Calib End Date: 11/06/2012 17:18

Lab File ID: F3387.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ethyl ether	Ave	0.3606	0.3638		53.9	50.0	0.9	20.0
3-Chloro-1-propene	Lin1		0.9678		51.5	50.0	3.0	20.0
2-Methyl-2-propanol	Ave	0.0782	0.0896		1150	1000	14.6	20.0
Halothane	Ave	0.2164	0.2480		57.3	50.0	14.6	20.0
Isopropyl ether	Ave	1.940	2.025		52.2	50.0	4.4	20.0
Tert-butyl ethyl ether	Ave	1.488	1.580		53.1	50.0	6.2	20.0
Propionitrile	Ave	0.0968	0.1040		537	500	7.4	20.0
Tert-amyl methyl ether	Ave	1.013	1.038		51.2	50.0	2.4	20.0
n-Heptane	Ave	0.9743	1.128		57.9	50.0	15.8	20.0
2,4,4-Trimethyl-1-pentene	Ave	0.5393	0.6463		59.9	50.0	19.8	20.0
2,4,4-Trimethyl-2-pentene	Lin1		0.9021		57.4	50.0	14.9	20.0
1,4-Dioxane	Ave	0.0127	0.0126		2090	2000	-0.4	20.0
2-Nitropropane	Ave	0.3742	0.4156		278	250	11.1	20.0

FORM VII 8260C

TC
2/21/13

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-27939-1

SDG No.:

Client Sample ID: OC-SD-EDSD/SW7-XXX | Lab Sample ID: 480-27939-1

Matrix: Solid | Lab File ID: F3398.D

Analysis Method: 8260C | Date Collected: 11/06/2012 09:55

Sample wt/vol: 5.66(g) | Date Analyzed: 11/10/2012 03:43

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624 (60) ID: 0.25(mm)

% Moisture: 23.6 | Level: (low/med) Low

Analysis Batch No.: 90065 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
630-20-6	1,1,1,2-Tetrachloroethane	ND		2.9	0.58
71-55-6	1,1,1-Trichloroethane	ND		2.9	0.42
79-34-5	1,1,2,2-Tetrachloroethane	ND		2.9	0.94
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	4.1		2.9	1.3
79-00-5	1,1,2-Trichloroethane	ND		2.9	0.75
75-34-3	1,1-Dichloroethane	ND		2.9	0.71
75-35-4	1,1-Dichloroethene	ND		2.9	0.71
563-58-6	1,1-Dichloropropene	ND		2.9	0.82
87-61-6	1,2,3-Trichlorobenzene	ND		2.9	0.61
96-18-4	1,2,3-Trichloropropane	ND		2.9	0.59
120-82-1	1,2,4-Trichlorobenzene	ND		2.9	0.35
95-63-6	1,2,4-Trimethylbenzene	ND		2.9	1.1
96-12-8	1,2-Dibromo-3-Chloropropane	ND		29	2.9
95-50-1	1,2-Dichlorobenzene	ND		2.9	0.45
107-06-2	1,2-Dichloroethane	ND		2.9	0.29
78-87-5	1,2-Dichloropropane	ND		2.9	2.9
108-67-8	1,3,5-Trimethylbenzene	ND		2.9	0.37
541-73-1	1,3-Dichlorobenzene	ND		2.9	0.30
142-28-9	1,3-Dichloropropane	ND		2.9	0.35
106-46-7	1,4-Dichlorobenzene	ND		2.9	0.81
123-91-1	1,4-Dioxane	ND		290	28
594-20-7	2,2-Dichloropropane	ND		2.9	0.98
107-39-1	2,4,4-Trimethyl-1-pentene	ND		5.8	0.50
107-40-4	2,4,4-Trimethyl-2-pentene	1.6	J	5.8	0.61
78-93-3	2-Butanone (MEK)	ND		29	2.1
95-49-8	2-Chlorotoluene	ND		2.9	0.38
591-78-6	2-Hexanone	ND		29	2.9
106-43-4	4-Chlorotoluene	ND		2.9	0.68
99-87-6	4-Isopropyltoluene	ND		2.9	0.46
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		29	1.9
67-64-1	Acetone	ND		290	4.9
71-43-2	Benzene	ND		2.9	0.28
108-86-1	Bromobenzene	ND		2.9	1.0
75-25-2	Bromoform	ND		2.9	2.9
74-83-9	Bromomethane	ND		5.8	0.52

TC
2/21/13

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TestAmerica Buffalo | Job No.: 480-27939-1

SDG No.:

Client Sample ID: OC-SD-EDSD/SW7-XXX | Lab Sample ID: 480-27939-1

Matrix: Solid | Lab File ID: F3398.D

Analysis Method: 8260C | Date Collected: 11/06/2012 09:55

Sample wt/vol: 5.66(g) | Date Analyzed: 11/10/2012 03:43

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624 (60) ID: 0.25(mm)

% Moisture: 23.6 | Level: (low/med) Low

Analysis Batch No.: 90065 | Units: ug/Kg

Number TICs Found: 8 | TIC Result Total: 67.5

CAS NO.	COMPOUND NAME	RT	RESULT	Q
1115-11-3	2-Butenal, 2-methyl-	7.65	6.3	~~T~~ J N
19549-87-2	2,4-Dimethyl-1-heptene	7.77	6.6	~~T~~ J N
1678-97-3	Cyclohexane, 1,2,3-trimethyl-	7.90	16	~~T~~ J N
2198-23-4	4-Nonene	8.04	8.6	~~T~~ J N
999-7-5	Octane, 4-chloro-	8.18	10	~~T~~ J N
~~556-67-2~~	~~Cyclotetrasiloxane, octamethyl-~~	~~9.57~~	~~6.2~~	~~T J N~~
3891-98-3	Dodecane, 2,6,10-trimethyl-	10.48	7.6	~~T~~ J N
17301-28-9	Undecane, 3,6-dimethyl-	12.01	6.2	~~T~~ J N

FORM I-TIC 8260C

TC
2/21/13

(1) Sediment Sample

SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / (II) / III (circle one)

SITE: Olin Chemical Superfund Site Project #: 6107130016-10 SDG #: 480-27939-1

LAB #: TAL-Buffalo

Sample IDs: Attached tracking sheet OC-SD-EDSD / SW2-XXX

This checklist is designed to be used with USEPA Region I Validation Guidelines Part II (12/1996). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO	NA		
			Data completeness	
☑	☐	☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑	☐	☐	Data summaries match EDD	
			Holding Times and Preservation	
☑	☐	☐	Hold times met (Waters – Extract within 7 days, analyze within 40 days. Soils – extract within 14 days, analyze within 40 days)	
			Instrument Performance Check (Tune)	
☑	☐	☐	Tune available for each 12-hour period samples were analyzed	
☑	☐	☐	Appropriate number of significant figures reported (at least 2)	
☑	☐	☐	Mass/Charge list (m/z) criteria met	
			Initial Calibration	
☑	☐	☐	%RSD less than or equal to 30%	
☑	☐	☐	RRF greater than or equal to 0.05	
			Continuing Calibration	
☑	☐	☐	%D less than or equal to 25%	
☑	☐	☐	RRF greater than or equal to 0.05.	
			Blank Contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.
☑	☐	☐	Method blank contamination → TIC's	
☐	☐	☑	Equipment/Rinseate blank contamination → Not Collected	

SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

Yes	NO	N/A	TIER I / (II) / III (circle one)	
			Surrogate Recoveries	
☑	☐	☐	Surrogates percent recovery criteria met: Soil = (base/neutral 30%-130%, acid 30%-130%) Water = (base/neutral 30%-130%, acid 15%-110%)	
			Matrix Spikes and Laboratory Control Samples	
☐	☐	☑	MS/MSD percent recovery criteria met Soil and Water = (base/neutral 40%-140%, acid 30%-130%)	Not Submitted
☐	☐	☑	MS/MSD RPD criteria met (soils <50%, water <30%)	
☐	☑	☐	LCS percent recovery criteria met soil/water (base 40%-140%, acid 30%-130%)	See Attached Form III
			Field Duplicates	
☐	☐	☑	RPD criteria met (soils <50%, water <30%)	Not Submitted
			Internal Standard	
☑	☐	☐	Area counts within -50 to +100 percent of calib. std.	
☑	☐	☐	Retention Time within 30 seconds of calib. std.	
			Target Compounds	
☑	☐	☐	Reviewed narrative for anomalies	
			Tentatively Identified Compounds (TICs)	
☐	☑	☐	TCL compounds reported as TICs	

Validator's Signature: [signature]

Date: ~~2/21/13~~ 3/15/13

reviewed Data that was resubmitted by the Lab on 3/11/13

Reference:

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-27939-1

SDG No.:

Client Sample ID: OC-SD-EDSD/SW7-XXX | Lab Sample ID: 480-27939-1

Matrix: Solid | Lab File ID: X2253.D

Analysis Method: 8270D | Date Collected: 11/06/2012 09:55

Extract. Method: 3546 | Date Extracted: 11/19/2012 16:43

Sample wt/vol: 000030.8(g) | Date Analyzed: 11/20/2012 23:39

Con. Extract Vol.: 1(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: 23.6 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 92064 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	ND		42	13
95-50-1	1,2-Dichlorobenzene	ND		42	13
541-73-1	1,3-Dichlorobenzene	ND		42	13
100-52-7	Benzaldehyde	ND		42	13
106-46-7	1,4-Dichlorobenzene	ND		42	13
108-60-1	2,2'-oxybis[1-chloropropane]	ND		42	13
95-95-4	2,4,5-Trichlorophenol	ND		42	14
88-06-2	2,4,6-Trichlorophenol	ND		42	18
100-51-6	Benzyl alcohol	ND		85	13
120-83-2	2,4-Dichlorophenol	ND		42	13
105-67-9	2,4-Dimethylphenol	ND		42	13
51-28-5	2,4-Dinitrophenol	~~ND~~	* R	42	34
121-14-2	2,4-Dinitrotoluene	ND		42	13
100-01-6	4-Nitroaniline	ND		210	36
606-20-2	2,6-Dinitrotoluene	ND	* UJ	42	36
91-58-7	2-Chloronaphthalene	ND		42	13
95-57-8	2-Chlorophenol	ND		42	13
86-30-6	N-Nitrosodiphenylamine	ND		42	13
91-57-6	2-Methylnaphthalene	ND		42	13
95-48-7	2-Methylphenol	ND		42	13
88-75-5	2-Nitrophenol	ND		42	17
15831-10-4	3 & 4 Methylphenol	ND		42	13
91-94-1	3,3'-Dichlorobenzidine	ND		85	15
88-74-4	2-Nitroaniline	ND		210	54
101-55-3	4-Bromophenyl phenyl ether	ND		42	13
77-47-4	Hexachlorocyclopentadiene	ND		85	13
106-47-8	4-Chloroaniline	ND		85	38
100-02-7	4-Nitrophenol	~~ND~~	* R	210	18
83-32-9	Acenaphthene	19	J	42	13
534-52-1	4,6-Dinitro-2-methylphenol	~~ND~~	R	210	41
95-94-3	1,2,4,5-Tetrachlorobenzene	ND		42	13
208-96-8	Acenaphthylene	ND		42	13
98-86-2	Acetophenone	ND		42	13
62-53-3	Aniline	ND		42	13

TC 3/15/13

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-27939-1

SDG No.:

Client Sample ID: OC-SD-EDSD/SW7-XXX | Lab Sample ID: 480-27939-1

Matrix: Solid | Lab File ID: X2253.D

Analysis Method: 8270D | Date Collected: 11/06/2012 09:55

Extract. Method: 3546 | Date Extracted: 11/19/2012 16:43

Sample wt/vol: 000030.8(g) | Date Analyzed: 11/20/2012 23:39

Con. Extract Vol.: 1(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: 23.6 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 92064 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
120-12-7	Anthracene	40	J	42	13
1912-24-9	Atrazine	ND		42	13
103-33-3	Azobenzene	ND		42	13
56-55-3	Benzo[a]anthracene	250		42	13
50-32-8	Benzo[a]pyrene	240		42	13
205-99-2	Benzo[b]fluoranthene	430		42	13
191-24-2	Benzo[g,h,i]perylene	110		42	13
105-60-2	Caprolactam	ND		42	13
99-09-2	3-Nitroaniline	ND		210	13
207-08-9	Benzo[k]fluoranthene	170		42	22
111-91-1	Bis(2-chloroethoxy)methane	ND		42	13
92-52-4	1,1'-Biphenyl	ND		42	13
111-44-4	Bis(2-chloroethyl)ether	ND		42	13
117-81-7	*Bis(2-ethylhexyl) phthalate*	960 ~~770~~	~~E~~ J	*210*	*85*
85-68-7	Butyl benzyl phthalate	ND		42	13
218-01-9	Chrysene	380		42	13
621-64-7	N-Nitrosodi-n-propylamine	ND		42	13
65-85-0	Benzoic acid	160	J	210	19
53-70-3	Dibenz(a,h)anthracene	37	J	42	13
132-64-9	Dibenzofuran	ND		42	13
84-66-2	Diethyl phthalate	ND		42	14
131-11-3	Dimethyl phthalate	ND		42	13
84-74-2	Di-n-butyl phthalate	ND		210	64
117-84-0	Di-n-octyl phthalate	ND		42	13
101-84-8	Phenyl ether	ND		42	13
58-90-2	2,3,4,6-Tetrachlorophenol	ND		42	13
206-44-0	Fluoranthene	640		42	13
59-50-7	4-Chloro-3-methylphenol	ND		85	13
86-73-7	Fluorene	20	J	42	13
7005-72-3	4-Chlorophenyl phenyl ether	ND		42	13
118-74-1	Hexachlorobenzene	ND		42	13
87-68-3	Hexachlorobutadiene	ND		42	13
67-72-1	Hexachloroethane	ND		42	13
193-39-5	Indeno[1,2,3-cd]pyrene	110		42	13

TC 3/15/13

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-27939-1

SDG No.:

Client Sample ID: OC-SD-EDSD/SW7-XXX | Lab Sample ID: 480-27939-1

Matrix: Solid | Lab File ID: X2253.D

Analysis Method: 8270D | Date Collected: 11/06/2012 09:55

Extract. Method: 3546 | Date Extracted: 11/19/2012 16:43

Sample wt/vol: 000030.8(g) | Date Analyzed: 11/20/2012 23:39

Con. Extract Vol.: 1(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: 23.6 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 92064 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
78-59-1	Isophorone	ND		42	13
91-20-3	Naphthalene	ND		42	13
98-95-3	Nitrobenzene	ND		42	13
87-86-5	Pentachlorophenol	ND		42	13
85-01-8	Phenanthrene	310		42	13
119-61-9	Benzophenone	ND		42	13
108-95-2	Phenol	26	J	42	13
129-00-0	Pyrene	430		42	13
62-75-9	N-Nitrosodimethylamine	ND	UJ	42	13
86-74-8	Carbazole	63		42	13
90-12-0	1-Methylnaphthalene	ND		42	13
106-44-5	4-Methylphenol	ND		42	13
122-39-4	Diphenylamine	ND		42	13

CAS NO.	SURROGATE	%REC	Q	LIMITS
118-79-6	2,4,6-Tribromophenol	69		30-130
367-12-4	2-Fluorophenol	51		30-130
4165-60-0	Nitrobenzene-d5	46		30-130
4165-62-2	Phenol-d5	50		30-130
321-60-8	2-Fluorobiphenyl	63		30-130
1718-51-0	p-Terphenyl-d14	63		30-130

TC
3/15/13

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TestAmerica Buffalo | Job No.: 480-27939-1

SDG No.:

Client Sample ID: OC-SD-EDSD/SW7-XXX | Lab Sample ID: 480-27939-1

Matrix: Solid | Lab File ID: X2253.D

Analysis Method: 8270D | Date Collected: 11/06/2012 09:55

Extract. Method: 3546 | Date Extracted: 11/19/2012 16:43

Sample wt/vol: 000030.8(g) | Date Analyzed: 11/20/2012 23:39

Con. Extract Vol.: 1(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: 23.6 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 92064 | Units: ug/Kg

Number TICs Found: 10 | TIC Result Total: 3730

CAS NO.	COMPOUND NAME	RT	RESULT	Q
	~~Unknown~~	~~4.24~~	~~390~~	~~T J~~ e
~~106-42-3~~	~~p-Xylene~~	~~4.67~~	~~650~~	~~T J N~~ e
	Unknown	12.51	210	~~T~~ J N
	Unknown	12.57	350	~~T~~ J N
	Unknown	12.61	370	~~T~~ J N
	Unknown	12.64	320	~~T~~ J N
	Unknown	12.68	270	~~T~~ J N
	Unknown	12.73	220	~~T~~ J N
	Unknown	12.79	510	~~T~~ J N
	Unknown	12.84	440	~~T~~ J N

TC
3/15/13

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X2251.D

Lab ID: LCS 480-91830/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
1,2,4-Trichlorobenzene	66.2	46.7	71	40-140	
1,2-Dichlorobenzene	66.2	43.3	65	40-140	
1,3-Dichlorobenzene	66.2	41.4	63	40-140	
1,4-Dichlorobenzene	66.2	40.3	61	40-140	
2,2'-oxybis[1-chloropropane]	66.2	39.5	60	40-140	
2,4,5-Trichlorophenol	66.2	52.2	79	30-130	
2,4,6-Trichlorophenol	66.2	40.0	60	30-130	
Benzyl alcohol	66.2	27.1 J	41		
2,4-Dichlorophenol	66.2	45.7	69	30-130	
2,4-Dimethylphenol	66.2	54.7	83	30-130	
2,4-Dinitrophenol	66.2	ND	0	30-130	*
2,4-Dinitrotoluene	66.2	39.1	59	40-140	
4-Nitroaniline	66.2	39.9 J	60		
2,6-Dinitrotoluene	66.2	ND	25	40-140	*
2-Chloronaphthalene	66.2	45.2	68	40-140	
2-Chlorophenol	66.2	44.6	67	30-130	
N-Nitrosodiphenylamine	66.2	23.9 J	36	40-140	
2-Methylnaphthalene	66.2	44.8	68	40-140	
2-Methylphenol	66.2	48.0	72	30-130	
2-Nitrophenol	66.2	44.4	67	30-130	
3,3'-Dichlorobenzidine	66.2	36.9 J	56	40-140	
2-Nitroaniline	66.2	ND	57		
4-Bromophenyl phenyl ether	66.2	48.2	73	40-140	
Hexachlorocyclopentadiene	66.2	39.6 J	60		
4-Chloroaniline	66.2	32.9 J	50	40-140	
4-Nitrophenol	66.2	ND	0	30-130	*
Acenaphthene	66.2	46.1	70	40-140	
4,6-Dinitro-2-methylphenol	66.2	ND	0		
Acenaphthylene	66.2	50.5	76	40-140	
Aniline	66.2	32.0 J	48	40-140	
Anthracene	66.2	47.7	72	40-140	
Azobenzene	66.2	45.4	69	40-140	
Benzo[a]anthracene	66.2	51.7	78	40-140	
Benzo[a]pyrene	66.2	48.8	74	40-140	
Benzo[b]fluoranthene	66.2	46.3	70	40-140	
Benzo[g,h,i]perylene	66.2	68.2	103	40-140	
3-Nitroaniline	66.2	34.2 J	52		
Benzo[k]fluoranthene	66.2	46.1	70	40-140	
Bis(2-chloroethoxy)methane	66.2	42.9	65	40-140	
Bis(2-chloroethyl)ether	66.2	42.2	64	40-140	
Bis(2-ethylhexyl) phthalate	66.2	ND	90	40-140	
Butyl benzyl phthalate	66.2	57.8	87	40-140	

Column to be used to flag recovery and RPD values

3/15/13
JC

FORM III 8270D

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X2251.D

Lab ID: LCS 480-91830/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
Chrysene	66.2	52.9	80	40-140	
N-Nitrosodi-n-propylamine	66.2	43.9	66		
Benzoic acid	66.2	ND	0		
Dibenz(a,h)anthracene	66.2	69.1	104	40-140	
Dibenzofuran	66.2	48.3	73	40-140	
Diethyl phthalate	66.2	48.3	73	40-140	
Dimethyl phthalate	66.2	43.8	66	40-140	
Di-n-butyl phthalate	66.2	51.4 J	78	40-140	
Di-n-octyl phthalate	66.2	61.3	93	40-140	
Fluoranthene	66.2	50.7	77	40-140	
4-Chloro-3-methylphenol	66.2	51.8 J	78		
Fluorene	66.2	45.1	68	40-140	
4-Chlorophenyl phenyl ether	66.2	48.3	73		
Hexachlorobenzene	66.2	52.4	79	40-140	
Hexachlorobutadiene	66.2	47.7	72	40-140	
Hexachloroethane	66.2	47.3	71	40-140	
Indeno[1,2,3-cd]pyrene	66.2	66.5	100	40-140	
Isophorone	66.2	51.0	77	40-140	
Naphthalene	66.2	45.1	68	40-140	
Nitrobenzene	66.2	46.0	69	40-140	
Pentachlorophenol	66.2	43.2	65	30-130	
Phenanthrene	66.2	54.7	83	40-140	
Phenol	66.2	46.3	70	30-130	
Pyrene	66.2	61.8	93	40-140	
N-Nitrosodimethylamine	66.2	109	164		
4-Methylphenol	66.2	46.5	70		

Column to be used to flag recovery and RPD values

FORM III 8270D

3/15/13 TC

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X2252.D

Lab ID: LCSD 480-91830/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
1,2,4-Trichlorobenzene	66.0	46.1	70	1	30	40-140	
1,2-Dichlorobenzene	66.0	43.8	66	1	30	40-140	
1,3-Dichlorobenzene	66.0	41.5	63	0	30	40-140	
1,4-Dichlorobenzene	66.0	42.6	64	6	30	40-140	
2,2'-oxybis[1-chloropropane]	66.0	39.0	59	1	30	40-140	
2,4,5-Trichlorophenol	66.0	56.2	85	7	30	30-130	
2,4,6-Trichlorophenol	66.0	46.0	70	14	30	30-130	
Benzyl alcohol	66.0	22.8 J	35	17			
2,4-Dichlorophenol	66.0	49.2	74	7	30	30-130	
2,4-Dimethylphenol	66.0	53.9	82	1	30	30-130	
2,4-Dinitrophenol	66.0	ND	0	NC	30	30-130	*
2,4-Dinitrotoluene	66.0	39.4	60	1	30	40-140	
4-Nitroaniline	66.0	39.1 J	59	2			
2,6-Dinitrotoluene	66.0	ND	27	6	30	40-140	*
2-Chloronaphthalene	66.0	45.6	69	1	30	40-140	
2-Chlorophenol	66.0	46.0	70	3	30	30-130	
N-Nitrosodiphenylamine	66.0	25.2 J	38	5			
2-Methylnaphthalene	66.0	48.0	73	7	30	40-140	
2-Methylphenol	66.0	55.4	84	14	30	30-130	
2-Nitrophenol	66.0	43.7	66	2	30	30-130	
3,3'-Dichlorobenzidine	66.0	42.6 J	65	14	30	40-140	
2-Nitroaniline	66.0	43.7 J	66	14			
4-Bromophenyl phenyl ether	66.0	51.5	78	6	30	40-140	
Hexachlorocyclopentadiene	66.0	41.7 J	63	5			
4-Chloroaniline	66.0	34.9 J	53	6	30	40-140	
4-Nitrophenol	66.0	48.4 J	73	200	30	30-130	*
Acenaphthene	66.0	46.4	70	1	30	40-140	
4,6-Dinitro-2-methylphenol	66.0	42.8 J	65	200			
Acenaphthylene	66.0	51.7	78	2	30	40-140	
Aniline	66.0	32.1 J	49	0	30	40-140	
Anthracene	66.0	53.9	82	12	30	40-140	
Azobenzene	66.0	50.4	76	11	30	40-140	
Benzo[a]anthracene	66.0	54.2	82	5	30	40-140	
Benzo[a]pyrene	66.0	49.5	75	1	30	40-140	
Benzo[b]fluoranthene	66.0	49.5	75	7	30	40-140	
Benzo[g,h,i]perylene	66.0	80.5	122	17	30	40-140	
3-Nitroaniline	66.0	38.2 J	58	11			
Benzo[k]fluoranthene	66.0	53.7	81	15	30	40-140	
Bis(2-chloroethoxy)methane	66.0	44.4	67	3	30	40-140	
Bis(2-chloroethyl)ether	66.0	43.4	66	3	30	40-140	
Bis(2-ethylhexyl) phthalate	66.0	ND	96	6	30	40-140	
Butyl benzyl phthalate	66.0	62.3	94	8	30	40-140	

Column to be used to flag recovery and RPD values

FORM III 8270D

3/15/13

03/11/2013 JK

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X2252.D

Lab ID: LCSD 480-91830/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Chrysene	66.0	63.8	97	19	30	40-140	
N-Nitrosodi-n-propylamine	66.0	45.3	69	3			
Benzoic acid	66.0	ND	0	NC			
Dibenz(a,h)anthracene	66.0	78.2	119	12	30	40-140	
Dibenzofuran	66.0	51.5	78	6	30	40-140	
Diethyl phthalate	66.0	51.0	77	5	30	40-140	
Dimethyl phthalate	66.0	47.6	72	8	30	40-140	
Di-n-butyl phthalate	66.0	54.9 J	83	7	30	40-140	
Di-n-octyl phthalate	66.0	65.5	99	7	30	40-140	
Fluoranthene	66.0	54.4	82	7	30	40-140	
4-Chloro-3-methylphenol	66.0	59.1 J	90	13			
Fluorene	66.0	48.4	73	7	30	40-140	
4-Chlorophenyl phenyl ether	66.0	49.5	75	3			
Hexachlorobenzene	66.0	56.3	85	7	30	40-140	
Hexachlorobutadiene	66.0	45.0	68	6	30	40-140	
Hexachloroethane	66.0	44.0	67	7	30	40-140	
Indeno[1,2,3-cd]pyrene	66.0	70.1	106	5	30	40-140	
Isophorone	66.0	51.1	77	0	30	40-140	
Naphthalene	66.0	45.8	69	1	30	40-140	
Nitrobenzene	66.0	46.7	71	2	30	40-140	
Pentachlorophenol	66.0	46.5	70	7	30	30-130	
Phenanthrene	66.0	57.6	87	5	30	40-140	
Phenol	66.0	45.9	69	1	30	30-130	
Pyrene	66.0	67.0	102	8	30	40-140	
N-Nitrosodimethylamine	66.0	85.9	130	24			
4-Methylphenol	66.0	46.5	70	0			

Column to be used to flag recovery and RPD values

FORM III 8270D

TC 3/15/13

Report Date: 11-Mar-2013 15:22:19 Chrom Revision: 2.0 01-Feb-2013 10:03:10
Data File: \\Bufchrom\ChromData\HP5973X\20121121-16870.b\X2259.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
109 3,3'-Dichlorobenzidine	252		15.739					
110 Bis(2-ethylhexyl) phthalate	149	15.743	15.753	-0.010	96	800642	4.54	
111 Benzo[a]anthracene	228	15.753	15.758	-0.005	90	288337	1.17	
112 Chrysene	228	15.786	15.791	-0.005	90	470059	1.82	
113 Di-n-octyl phthalate	149		16.290					
114 Benzo[b]fluoranthene	252	16.694	16.694	0.0	91	617882	1.83	
115 Benzo[k]fluoranthene	252	16.714	16.718	-0.004	94	241156	0.6894	M
116 Benzo[a]pyrene	252	16.994	16.994	0.0	68	328637	1.11	
117 Indeno[1,2,3-cd]pyrene	276	18.145	18.135	0.010	90	182250	0.6388	
118 Dibenz(a,h)anthracene	278		18.140					
119 Benzo[g,h,i]perylene	276	18.464	18.449	0.015	82	172731	0.6835	
S 120 3 & 4 Methylphenol	108		0.000					

QC Flag Legend

Processing Flags
1 - Missing Peaks
4 - Failed Signal Ratio Test
9 - Failed A Reference Spectral Test

Review Flags
M - Manually Integrated

OC-SD-EDSD/SW7-XXY

Calculation check: Bis-(2 ethylhexyl) phthalate

I-cal RRF

$0.7696 = \frac{800642\,(5)}{1146515\,(X)} = 4.5369 \times 5^{DF} \times$

$22.68\,ng/ul \times \frac{1\,ml}{30.8\,g} \times \frac{1}{.764}$

963.82 ug/kg dry

960 reported ✓

TC
3/15/13

November Sediment

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER I / (II) / III (circle one)

SITE: **Olin Chemical** Project #: 6107130016-10 SDG #: 480-27939-1

LAB # : Test America - Buffalo

Sample IDs: Attached tracking sheet or sample listing. OC-SD-EDSD/SW7-XXX

This checklist is designed to be used with the USEPA Data Validation Guidelines Part IV (November 2008). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

(TC) ~~**Method 6020A for Arsenic and Thallium,**~~ **Hg by 7470A, All other Metals by 6010C.**

YES	NO	NA		
				Lab will re report Tin if possible
Data completeness				
☑	☐	☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	* Missing Tin Lab contacted 2/22/13 Contact lab if missing data. Lab to respond via phone and email with 24 hours.
☑	☐	☐	Data summaries match EDD	Sample on pg 1250
Holding Times and Preservation				Lab can not report T/N for Sample OC-SD-EDSD/SW7-XXX
☑	☐	☐	Hold times met (6 months, 28 days Hg)	
☑	☐	☐	Preserved (waters HNO_3)	
Calibration				
☐	☐	☑	ICP/MS Instrument Tune. NO ICP-MS	Verify that tuning meets mass, resolution, and RSD method criteria.
☐	☐	☑	Mass calibration criteria ≤ 0.1amu from true	ICP: at least one blank and one standard
☐	☐	☑	Resolution <0.7 +/-0.1amu full width @ 10% peak height	Hg: at least one blank and four standards
☐	☐	☑	RSD < 5%	Correlation coefficient criteria applicable to all analyses except ICP-AES.
☑	☐	☐	Appropriate number of standards used to establish calibration curve.	90-110% for ICP-AES/MS, 80-120% for Hg.
☑	☐	☐	Correlation coefficient > 0.995 for Hg	See additional qualification actions in the Region 1 guidelines.
☑	☐	☐	Calibrated daily.	Every 10 samples or every 2 hrs.
☑	☐	☐	ICV/CCV %R within acceptance range.	70-130% for QL Standard. If out low, (J) detects less then 2X QL standard and (UJ) non-detects. See additional validation actions in the Region I guidelines.
☑	☐	☐	CCVs analyzed at the proper frequency.	
* ☐	☑	☐	QL Standard within limits	

NO ICP-MS

Silver @ 137% Arsenic 137%
Raw result in sample for Ag = 0.00204ppm J Qual in Final data

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

Yes No N/A — **TIER I / (II) / III (circle one)**

Blanks Method: ☑ ☐ ☐ Method blank was prepared with each batch of samples or with a maximum of 20 samples ☑ ☐ ☐ Results >MDL but not @ levels affecting sample results ☐ ☑ ☐ Absolute value negative MB results > 5x MDL ☐ ☐ ☑ For ICP/MS verify IS responses meet method criteria NO 6020 analysis	Evaluate all blanks for contamination. Highest contaminant level used for action level. 5X the highest blank contamination is the action level.
Calibration Blanks: ☐ ☑ ☐ ICB/CCB results > IDL ☐ ☑ ☐ Absolute value of negative ICB/CCB results > 5x MDL ☑ ☐ ☐ CCB analyzed every 10 samples or 2 hrs. Equipment/Rinseate Blanks: ☐ ☐ ☑ Results >MDL ☐ ☐ ☑ Absolute value of negative ICB/CCB results > 5x MDL	Not submitted
Interference Check Sample ☑ ☐ ☐ ICS analyzed at proper frequency ☑ ☐ ☐ Interference present in sample at > 50% concentration in ICS Fe @ 158mg/L Raw ☑ ☐ ☐ ICS AB %R 80%-120% ICP-MS Internal Standard Intensities NO ICP-MS ☐ ☐ ☑ Internal standard relative intensities reported by the laboratory ☐ ☐ ☑ Internal standard relative intensities are within 60 – 125 %	An ICS must be run at the beginning and end of run or every 8 hours. If interferences (Al, Ca, Fe, Mg) are not > 50% ICS concentration in sample, do not apply. → See attached Form 4a. for Explanation No Quals given Qualify data based on Region 1 guideline Note: MCP Limits are 30 – 120%
Matrix Spikes * ☐ ☑ ☐ All compounds are within %R of 75-125% excluding results exceeding the spike concentration by ≥4x ☑ ☐ ☐ Were post-digestion spikes reported for unacceptable pre-digestion spike recoveries ☐ ☑ ☐ Was a field blank used for spike analysis ↓ Post digestion spike was w/in limits	MS : MSD on Sample OC-SD-EDSD/SW7-XXX → See attached Form 5A Ni ↑, Pb ↓, Mg ↑, Cu ↓, Al ↑, Ba ↑, Cr ↓, K ↑ Post-digestion spikes %R limits = 75% - 125%

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

Yes	No	N/A	TIER I / (II) / III (circle one)	
			Laboratory Control Samples (LCS)	
☐	☑		☐ Percent recoveries are within limits (waters and soil 80-120%)	See attached
☑	☐		☐ An LCS was analyzed for each matrix, batch of samples, or every 20 samples.	
			Laboratory Duplicate	
☐	☐		☑ Was a field blank used as the lab duplicate	
☐	☐		☑ Is the RPD within water control limits of ±20% for sample values >5x RL(35% for soil)	Only (1) Sample reported in SDG
☐	☐		☑ Is the control limit of ± RL met for sample values <5x RL (2x RL for soil)	No Lab dup associated
☐	☐		☑ Was a duplicate analyzed for every matrix and every 20 samples or batch	
			Field Duplicate	
☐	☐	☑	For sample values >5x RL, the RPD control limit of ± 30% (50% for soil) was met	Not Collected
☐	☐	☑	For sample values <5x RL, the control limit of ±2x RL (4x RL for soil) was met	
			Serial Dilution	
☑	☐	☐	Are any percent difference criteria > 15% (for samples with a concentration >50 times the IDL)	
☑	☐	☐	Are results of the diluted samples > the original sample results	

Validator's Signature: [signature]

Date: 2/25/13

Reference:

MACTEC, Project Operation Plan Volume IIB, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. .April 2009.

3-IN
METHOD BLANK
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

SDG No.:

Concentration Units: mg/Kg Lab Sample ID: MB 480-90562/1-A

Instrument Code: ICAP2 Batch No.: 91751

CAS No.	Analyte	Concentration	C	Q	Method
7440-22-4	Silver	ND		^	6010MCP
7440-38-2	Arsenic	ND		^	6010MCP
7440-39-3	Barium	0.297	J		6010MCP
7440-41-7	Beryllium	ND			6010MCP
7440-43-9	Cadmium	ND			6010MCP
7440-47-3	Chromium	ND			6010MCP
7440-02-0	Nickel	ND			6010MCP
7440-28-0	Thallium	ND			6010MCP
7440-62-2	Vanadium	ND			6010MCP
7440-66-6	Zinc	0.316	J		6010MCP
7439-92-1	Lead	ND			6010MCP
7440-36-0	Antimony	ND			6010MCP
7440-23-5	Sodium	ND			6010MCP
7440-09-7	Potassium	ND			6010MCP
7440-70-2	Calcium	7.05	J		6010MCP
7439-89-6	Iron	3.34	J		6010MCP
7439-95-4	Magnesium	1.01	J		6010MCP
7440-50-8	Copper	ND			6010MCP
7429-90-5	Aluminum	ND			6010MCP
7439-96-5	Manganese	0.0756	J		6010MCP
7440-48-4	Cobalt	ND			6010MCP

Contamination not affecting Sample
Blank results are < 5X Conc in Sample.

FORM III-IN

TC
2/22/13

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

SDG No.:

Method: 6010 Instrument ID: ICAP2

Lab Sample ID: CRI 480-91751/7 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00043

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Silver	0.00300	0.00410	J ^	137	70-130
Arsenic	0.0100	0.0137	^	137	70-130
Barium	0.00200	0.00228	J	114	70-130
Beryllium	0.00200	0.00192		96	70-130
Cadmium	0.00100	0.00100		100	70-130
Chromium	0.00400	0.00402	J	101	70-130
Nickel	0.0100	0.00993	J	99	70-130
Thallium	0.0200	0.0207		103	70-130
Vanadium	0.00500	0.00527	J	105	70-130
Zinc	0.0100	0.0122	J	122	70-130
Lead	0.00500	0.00463	J	93	70-130
Antimony	0.0200	0.0219		110	70-130
Sodium	1.00	1.03		103	70-130
Potassium	0.500	0.482	J	96	70-130
Calcium	0.500	0.501		100	70-130
Iron	0.0500	0.0531		106	70-130
Magnesium	0.200	0.220		110	70-130
Copper	0.0100	0.0115		115	70-130
Aluminum	0.200	0.191	J	96	70-130
Manganese	0.00300	0.00292	J	97	70-130
Cobalt	0.00400	0.00393	J	98	70-130

*See
*below

Lab Sample ID: CRI 480-91751/36 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00043

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Silver	0.00300	0.00318	J	106	70-130
Arsenic	0.0100	0.0106		106	70-130
Barium	0.00200	0.00211	J	106	70-130
Beryllium	0.00200	0.00196		98	70-130
Cadmium	0.00100	0.00106		106	70-130
Chromium	0.00400	0.00384	J	96	70-130
Nickel	0.0100	0.00957	J	96	70-130
Thallium	0.0200	0.0215		108	70-130
Vanadium	0.00500	0.00445	J	89	70-130

(J) Qual Silver in OC-SD-EDSD/SW7-XXX
Raw result for Silver was 0.002 mg/L

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IIB-IN

No Qual for Arsenic, Raw Result is >2X QL Std

2/22/13
TC

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

SDG No.:

Lab Sample ID: ICSA 480-91751/8 Instrument ID: ICAP2

Lab File ID: I2111612B-7.asc ICS Source: MEI_07_ICSA_00038

Concentration Units: mg/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Aluminum	**500**	**484**	**97**
Antimony		**-0.0015**	
Arsenic		**-0.0001**	
Barium		**0.0005**	
Beryllium		**-0.0001**	
Cadmium		**0.0019** * MDL= 0.0005	
Calcium	**500**	**456**	**91**
Chromium		**0.0001**	
Cobalt		**0.0005**	
Copper		**0.0024**	
Iron	**200**	**180**	**90**
Lead		**0.0009**	
Magnesium	**500**	**496**	**99**
Manganese		**0.0013**	
Nickel		**-0.0010**	
Potassium		**-0.151**	
Silver		**0.0001**	
Sodium		**-0.0011**	
Thallium		**-0.0011**	
Vanadium		**0.0021**	
Zinc		**0.0012**	
Boron		*-0.0019*	
Lithium		*0.0109*	
Molybdenum		*-0.0021*	
Silicon		*0.0203*	
Strontium		*0.0027*	
Tin		*0.0039*	
Titanium		*0.0037*	

* See Pg 726

Calculations are performed before rounding to avoid round-off errors in calculated results.

TC
2/22/13

FORM IVA-IN

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

SDG No.:

Lab Sample ID: ICSA 480-91751/37 Instrument ID: ICAP2

Lab File ID: I2111612B-7.asc ICS Source: MEI_07_ICSA_00038

Concentration Units: mg/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Aluminum	**500**	**481**	**96**
Antimony		**0.0001**	
Arsenic		**0.0000**	
Barium		**0.0005**	
Beryllium		**-0.0001**	
Cadmium		**0.0018**	MDL = 0.0005 *
Calcium	**500**	**428**	**86**
Chromium		**-0.0002**	
Cobalt		**0.0004**	
Copper		**0.0000**	
Iron	**200**	**166**	**83**
Lead		**0.0009**	
Magnesium	**500**	**504**	**101**
Manganese		**0.0013**	
Nickel		**-0.0010**	
Potassium		**-0.105**	
Silver		**0.0000**	
Sodium		**0.0395**	
Thallium		**-0.0047**	
Vanadium		**0.0027**	
Zinc		**0.0006**	
Boron		*0.0061*	
Lithium		*0.0092*	
Molybdenum		*-0.0019*	
Silicon		*0.0040*	
Strontium		*0.0026*	
Tin		*0.0030*	
Titanium		*0.0033*	

Iron is 158mg/L in Sample

Cd is 0.0018mg/L in ICSA
Cd is 0.0276mg/L in Sample

$\frac{.0018}{.0276} = 0.065$ or 6.5%, which is < 10% No Quals

2/22/13 TC

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IVA-IN

5A-IN
MATRIX SPIKE SAMPLE RECOVERY
METALS

Client ID: OC-SD-EDSD/SW7-XXX MS

Lab ID: 480-27939-1 MS

Lab Name: TestAmerica Buffalo

Job No.: 480-27939-1

SDG No.:

Matrix: Solid

Concentration Units: mg/Kg

% Solids: 76.4

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Silver	11.8		0.27	J	12.2	94	75-125	^	6010
Arsenic	64.9		26		48.9	79	75-125	^	6010
Barium	91.1		42		48.9	101	75-125		6010
Beryllium	48.5		1.6		48.9	96	75-125		6010
Cadmium	49.2		3.7		48.9	93	75-125		6010
Chromium	131		78		48.9	107	75-125		6010
Nickel	106		29		48.9	156	75-125	F	6010
Thallium	48.2		ND		48.9	98	75-125		6010
Vanadium	67.2		15		48.9	106	75-125		6010
Zinc	804		1900		48.9	-2304	75-125	4	6010
Lead	169		140		48.9	53	75-125	F	6010
Selenium	44.9		ND		48.9	92	75-125		6010
Antimony	41.6		0.89		48.9	83	75-125		6010
Sodium	2560		160	J	2450	98	75-125		6010
Potassium	3000		620		2450	97	75-125		6010
Calcium	4300		1900		2450	100	75-125		6010
Iron	20000		21000		2450	-43	75-125	4	6010
Magnesium	5080		2000		2450	127	75-125	F	6010
Copper	170		130		48.9	74	75-125	F	6010
Aluminum	8420		3800		2450	187	75-125	F	6010
Manganese	602		600		48.9	2	75-125	4	6010
Cobalt	63.6		13		48.9	104	75-125		6010
Mercury	0.428		0.026	J	0.438	92	75-125		7471A

SSR = Spiked Sample Result

(J) estimate all circled compounds above in OC-SD-EDSD/SW7-XXX

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VA - IN

TC
2/22/13

5A-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
METALS

Client ID: OC-SD-EDSD/SW7-XXX MSD

Lab ID: 480-27939-1 MSD

Lab Name: TestAmerica Buffalo

Job No.: 480-27939-1

SDG No.:

Matrix: Solid

Concentration Units: mg/Kg

% Solids: 76.4

Analyte	(SDR)	C	Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Silver	13.9		13.7	99	75-125	16	35	^	6010
Arsenic	79.3		54.7	97	75-125	20	35	^	6010
Barium	119		54.7	142	75-125	27	35	F	6010
Beryllium	54.0		54.7	96	75-125	11	35		6010
Cadmium	55.2		54.7	94	75-125	11	35		6010
Chromium	99.3		54.7	39	75-125	27	35	F	6010
Nickel	74.5		54.7	82	75-125	35	35		6010
Thallium	53.8		54.7	98	75-125	11	35		6010
Vanadium	75.9		54.7	111	75-125	12	35		6010
Zinc	605		54.7	-2425	75-125	28	35	4	6010
Lead	135		54.7	-15	75-125	23	35	F	6010
Selenium	53.4		54.7	98	75-125	17	35		6010
Antimony	48.8		54.7	88	75-125	16	35		6010
Sodium	2770		2740	95	75-125	8	35		6010
Potassium	4060		2740	126	75-125	30	35	F	6010
Calcium	4530		2730	98	75-125	5	35		6010
Iron	28800		2730	284	75-125	36	35	4 F	6010
Magnesium	5440		2730	127	75-125	7	35	F	6010
Copper	129		54.7	-9	75-125	27	35	F	6010
Aluminum	8150		2740	158	75-125	3	35	F	6010
Manganese	502		54.7	-181	75-125	18	35	4	6010
Cobalt	65.7		54.7	97	75-125	3	35		6010
Mercury	0.425		0.436	91	75-125	1	35		7471A

SDR = Sample Duplicate Result

(J) estimate all circled

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VD - IN

TC
2/22/13

5B-IN
POST DIGESTION SPIKE SAMPLE RECOVERY
METALS

Client ID: OC-SD-EDSD/SW7-XXX PDS
Lab ID: 480-27939-1 PDS
Lab Name: TestAmerica Buffalo
Job No.: 480-27939-1
SDG No.:
Matrix: Solid
Concentration Units: mg/Kg

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Silver	11.5		0.27	J	13.3	84	75-125	^	6010
Arsenic	71.1		26		53.2	85	75-125	^	6010
Barium	87.6		42		53.2	87	75-125		6010
Beryllium	49.3		1.6		53.2	90	75-125		6010
Cadmium	51.3		3.7		53.2	90	75-125		6010
Chromium	120		78		53.2	79	75-125		6010
Nickel	76.7		29		53.2	89	75-125		6010
Thallium	48.1		ND		53.2	91	75-125		6010
Vanadium	62.5		15		53.2	89	75-125		6010
Zinc	1920		1900		53.2	NC	75-125		6010
Lead	191		140		53.2	90	75-125		6010
Selenium	36.1		ND		53.2	68	75-125	W	6010
Antimony	45.4		0.89		53.2	84	75-125		6010
Sodium	2470		160	J	2660	87	75-125		6010
Potassium	3100		620		2660	93	75-125		6010
Calcium	3920		1900		2660	78	75-125		6010
Iron	22600		21000		2660	59	75-125	W	6010
Magnesium	4220		2000		2660	85	75-125		6010
Copper	178		130		53.2	84	75-125		6010
Aluminum	6180		3800		2660	88	75-125		6010
Manganese	620		600		53.2	NC	75-125		6010
Cobalt	63.1		13		53.2	95	75-125		6010

SSR = Spiked Sample Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VB - IN

TC
2/22/13

Sample Name: 480-27939-B-1-A Acquired: 11/16/2012 23:35:34 Type: Unk
Method: ICAP2 2012 (v112) Mode: CONC Corr. Factor: 1.000000
User: LMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	As1937	As1972	B_2089	Ba4554-2	Be3130	Ca3179
Line	328.068 {103}	308.215 {109}	189.042 {478}	193.759 {474}	197.262 {471}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(none)	(none)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00204**	**28.839**	**.19660**	**.2076**	**.1894**	**.02494**	**.31239**	**.01179**	**13.935**
Stddev	.00008	.200	.00076	.0061	.0006	.00014	.00094	.00010	.106
%RSD	3.9871	.69463	.38667	2.932	.3098	.56674	.30069	.81899	.75773
#1	.00210	28.697	.19714	.2033	.1890	.02504	.31173	.01186	13.860
#2	.00198	28.980	.19606	.2119	.1899	.02484	.31305	.01172	14.009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664	K_7664-2	Li6707	Mg2790
Line	228.802 {447}	228.616 {447}	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}	279.079 {121}2
IS Ref	(Y_2243)	(In2306)	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02767**	**.09597**	**.58893**	**1.0042**	**158.18**	**4.6545**	**4.4823**	**.07039**	**14.866**
Stddev	.00024	.00039	.00163	.0029	.96	.0206	.0131	.00134	.009
%RSD	.87998	.40597	.27729	.28906	.60463	.44337	.29120	1.9025	.05968
#1	.02750	.09625	.58778	1.0021	157.50	4.6399	4.4731	.06944	14.872
#2	.02785	.09570	.59009	1.0062	158.86	4.6691	4.4915	.07133	14.860
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Line	257.610 {131}	202.030 {467}	589.592 { 57}	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2
IS Ref	(Y_3600)	(Y_2243)	(Y_3774)	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**4.5217**	**.04227**	**1.1689**	**.22156**	**1.0763**	**135.37**	**.00667**	**.00902**	**14.134**
Stddev	.0095	.00000	.0014	.00069	.0051	.09	.00035	.00207	.128
%RSD	.21024	.00312	.12011	.31196	.47189	.06863	5.2256	22.984	.90807
#1	4.5150	.04227	1.1679	.22205	1.0727	135.44	.00692	.01048	14.043
#2	4.5284	.04227	1.1699	.22107	1.0799	135.30	.00643	.00755	14.224
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Y_3600-2	Y_3710	Zn2062
Line	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}	292.402 {115}	360.073 { 94}2	371.030 { 91}	206.200 {163}
IS Ref	(In2306)	(Y_3774)	(Y_3600)	(In2306)	(Y_3600)	(none)	(none)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	Cts/S	Cts/S	ppm
Avg	**.07840**	**.03186**	**1.9243**	**.00096**	**.11592**	*****	*****	**14.536**
Stddev	.00063	.00013	.0031	.00191	.00018	-----	-----	.006
%RSD	.80027	.42135	.15901	198.50	.15853	-----	-----	.03883
#1	.07795	.03176	1.9221	-.00039	.11579	3135.	10380.	14.540
#2	.07884	.03195	1.9265	.00231	.11605	3114.	10320.	14.532
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None	Chk Pass
High Limit								
Low Limit								

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3278.3**	**4852.4**	**28417.**	**8733.2**
Stddev	4.8	8.8	22.	80.9
%RSD	.14750	.18164	.07657	.92672
#1	3274.9	4846.2	28402.	8790.5
#2	3281.7	4858.7	28433.	8676.0

7A-IN
LCS-CERTIFIED REFERENCE MATERIAL
METALS

Lab ID: LCSSRM 480-90562/2-A

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

Sample Matrix: Solid LCS Source: MED_SRM_D077_00001

Analyte	Solid(mg/Kg)							
	True	Found	C	%R	Limits		Q	Method
Silver	45.2	39.2		86.8	62.1	125.7	^	6010
Arsenic	185	156		84.4	64.3	117.8	^	6010
Barium	629	195		30.9	24.8	43.0		6010
Beryllium	120	106		88.3	68.8	115.0		6010
Cadmium	112	102		91.0	76.9	106.3		6010
Chromium	352	109		30.9	23.6	43.9		6010
Nickel	98.7	71.3		72.2	50.4	91.7		6010
Thallium	229	225		98.3	63.2	119.3		6010
Vanadium	168	82.3		48.9	32.7	70.8		6010
Zinc	300	279		93.2	65.9	118.7		6010
Lead	75.9	78.9		104.0	69.7	133.4		6010
Antimony	252	86.7		34.5	10	120.7		6010
Sodium	17100	328		1.9	0.9	3.2		6010
Potassium	20000	2940		14.7	9.9	21.4		6010
Calcium	25500	6070		23.8	20.1	34.0		6010
Iron	43000	9890		23.0	9.8	50.8		6010
Magnesium	8860	2570		29.0	20.5	42.5		6010
Copper	136	120		87.9	64.7	108.1		6010
Aluminum	68300	7880		11.5	5.9	21.4		6010
Manganese	921	311		33.7	27.7	46.0		6010
Cobalt	150	138		92.1	64.9	109.3		6010

J Qual all circled analytes in associated sample

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA - IN

2/25/13
TC

7D-IN
LCSD - CERTIFIED REFERENCE MATERIAL
METALS

Lab ID: LCDSRM 480-90562/3-A

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

Sample Matrix: Solid LCS Source: MED_SRM_D077_00001

Analyte	(SDR)	C	Spike Added	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Silver	37.4		45.2	82.7	62.1-12	5	20	^	6010
Arsenic	149		185	80.6	64.3-11	5	20	^	6010
Barium	184		629	29.2	24.8-43	6	20		6010
Beryllium	102		120	84.7	68.8-11	4	20		6010
Cadmium	98.2		112	87.5	76.9-10	4	20		6010
Chromium	104		352	29.6	23.6-43	4	20		6010
Nickel	67.1		98.7	68.0	50.4-91	6	20		6010
Thallium	210		228	92.0	63.2-11	7	20		6010
Vanadium	79.2		168	47.0	32.7-70	4	20		6010
Zinc	267		300	89.2	65.9-11	4	20		6010
Lead	74.9		75.8	98.8	69.7-13	5	20		6010
Antimony	85.5		251	34.0	10-120.	1	20		6010
Sodium	303		17100	1.8	0.9-3.2	8	20		6010
Potassium	2790		20000	13.9	9.9-21.	5	20		6010
Calcium	5880		25400	23.1	20.1-34	3	20		6010
Iron	9300		43000	21.6	9.8-50.	6	20		6010
Magnesium	2370		8860	26.8	20.5-42	8	20		6010
Copper	115		136	84.3	64.7-10	4	20		6010
Aluminum	7350		68200	10.8	5.9-21.	7	20		6010
Manganese	296		921	32.1	27.7-46	5	20		6010
Cobalt	130		150	86.7	64.9-10	6	20		6010

J Qual all
Circled analytes in
associated sample

SDR = Spike Duplicate Results
Calculations are performed before rounding to avoid round-off errors in calculated results.

2/15/13
TC

Version 2, April 2003

Review/Date_____

OLIN-WILMINGTON Sediment
LEVEL I DATA QUALITY EVALUATION

STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date Tige Cunningham 2/25/13
Sr.

Lab Report # 480-27939-1
Project # 6107130016-10

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for **Sampling, Data Evaluation and Reporting Activities.**" MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

Chloride Ammonia TOC
Sulfate Nitrate/Nitrite

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? **Yes** [✓] No [ ] N/A [ ] Comments:
Check items received.

[✓] *Name of Laboratory* [✓] *Address* [✓] *Project ID* [✓] *Phone #* [✓] *Sample identification – Field and Laboratory*
Client Information: [✓] *Name* [✓] *Address* [✓] *Client Contact* *(IDs must be cross-referenced)*

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement **Yes** [ ] No [ ] N/A [✓] Comments: Not required for Method

Does the laboratory report include a completed Analytical Report Certification in the required format?

***ACTION**: If no, contact lab for submission of missing certification or certification with correct format.*

1.3 Laboratory Case Narrative: **Yes** [✓] No [ ] N/A [ ] Comments:

[✓] *Narrative serves as an exception report for the project and method QA/QC performance.* [ ] *Narrative includes an explanation of each discrepancy on the Certification Statement.*

***ACTION**: If no, contact lab for submission of missing or illegible information.*

1.4 Chain of Custody (COC) copy present with all documentation completed? **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (*Cooler Receipt Form*): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

Yes [✓] No [ ] N/A [ ] Comments:

☑ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☑ Container type noted ☑ Condition observed ☑ pH verified (where applicable) ☑ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used?

Yes [✓] No [ ] N/A [ ] Comments:

Ammonia,– 1 Liter polyethylene/H_2SO_4 to pH<2,cool to 4°C

Alkalinity – 1 500mL polyethylene/cool to 4°C

Chemical Oxygen Demand – 250 mL polyethylene/H_2SO_4 to pH<2,cool to 4°C

8 oz glass jar

Chloride, pH, sulfate - 1 500mL polyethylene/cool to 4°C

Organic Carbon – 500 mL amber glass bottle/HCl or H_2SO_4 to pH<2,cool to 4°C

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C
Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C

TSS, TDS - 1 500mL polyethylene/cool to 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage?

Yes [✓] No [ ] N/A [ ] Comments:

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes [ ] **No** [✓] N/A [ ] Comments:

1.6 Sample Results Section: *Was the following information supplied in the laboratory report for each sample?* **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Field ID and Lab ID ☑ Date and time collected ☑ Analyst Initials ☑ Dilution Factor ☑ % moisture or solids ☑ Reporting limits
☐ *Clean-up method* N/A ☑ Analysis method ☑ Preparation method ☑ Date of preparation/extraction/digestion clean-up and analysis, where applicable
☑ Matrix ☑ Target analytes and concentrations ☑ Units (soils must be reported in dry weight)
↳ except Nitrite, Ammonia

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch? **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Method blank results ☑ LCS recoveries ☐ MS/MSD recoveries and RPDs ☐ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times Yes [ ] **No** [✓] N/A [ ] Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days Sulfide, TDS, TSS = 7 days pH = analyze immediately Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method **Yes** [✓] No [ ] N/A [ ] Comments:

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

3.2 Are the practical quantitation limits the same as those specified by the ☐ SOW ☑ QAPP ☐ Lab? **Yes** [✓] No [ ] N/A [ ] Comments:

Note: *The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP*. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.*

Ammonia* ☑ = ~~0.1 mg/L~~ 5mg/kg	Alkalinity** ☐ = 1 mg/L	Bicarbonate Alkalinity** ☐ = 1 mg/L	Carbonate Alkalinity** ☐ = 1 mg/L
Nitrate Nitrogen as N* ☐ = .05 mg/L	Nitrite Nitrogen as N* ☐ = .01 mg/L	Chloride* ☑ = ~~1 mg/L~~ 20 mg/kg	Hardness * ☐ = 2.64 mg/L
Spec. Cond.** ☐ 3 umhos/cm	Total Organic Carbon** ☑ = ~~1 mg/L~~ 1000mg/kg		Sulfate (EPA 300.0)* ☑ = ~~2 mg/L~~ 40mg/kg
COD:* Low – 20 mg/L	pH* ☐ < 2 to > 12	TDS* ☐ = 10 mg/L	TSS* ☐ = 5 mg/L

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If *dilutions were required, were dilution factors reported?* **Yes** [ ] No [ ] N/A [ ] Comments:

ACTION: If no, contact the lab for submission.

4.0 <u>Method Blanks</u> **Yes** [✓] No [ ] N/A [ ] Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs). **Yes** [✓] No [ ] N/A [ ] Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following: Yes [✓] **No** [ ] N/A [ ] Comments:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

Nitrate @ 0.198 x5 = 0.99 mg/kg

If the sample concentration is > 5 × blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 5 × blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits? Yes [ ] **No** [✓] N/A [ ] Comments:

LCS Limits:

Alkalinity** ☐ = 80-120% Bicarbonate Alkalinity** ☐ = 80-120% Carbonate Alkalinity** ☐ = 80-120% Specific Conductivity *☐ = 80-120%

Total Organic Carbon** ☑ = 80-120% TDS** ☐ = 80-120% Ammonia Nitrogen as N* ☑ = 80-120%

COD Low* ☐ = 80-120% Nitrate Nitrogen as N**☐ = 80-120%% Nitrite Nitrogen as N** ☐= 80-120%

Hardness* ☐ = 80-120% Chloride* ☑ = 80-120% Sulfate (EPA 300.0)* ☑ = 80-120% pH* ☐ = 80-120% TSS* NA

Other parameter(list) _____ %R = _____ ☐ Rec Limits= _____

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

Yes [ ] No [✓] N/A [ ] Comments:

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

Yes [ ] No [ ] N/A [✓] Comments:

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix? **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: If any matrix spike data is missing, call lab for resubmission.

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$ Where: SSR = Spiked sample result; SR = Sample result; SA = Spike added

MS/MSD Recovery Limits:

Alkalinity* = NA Bicarbonate Alkalinity* = NA Carbonate alkalinity* = NA Ammonia* (LACHAT) ☐ = 74-125%

Chloride** ☐= 75-125% Specific Conductivity * = NA Total Organic Carbon* = NA TDS** = NA

COD Low* ☐ = 75-125% Nitrate Nitrogen as N** ☐ = 75-125%

Nitrite Nitrogen as N** ☐ = 75-125% Hardness* ☐ = 75-125% Sulfate (EPA 300.0)* ☐ = 75-125% pH* = NA TSS* = NA

Other parameter(list) _____ % R = _____ ☐ Rec Limits = _____

* = Laboratory Limits ** = Olin QAPP Limits *(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)*

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: $RPD = \frac{S - D}{(S + D)/2} \times 100\%$ Where S = MS result, D = MSD result

MS/MSD RPD Limits:

Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia** (LACHAT) ☐ = 20%
Chloride**(SM 4500 Cl) ☐ = 20%	Specific Conductivity * = NA	Total Organic Carbon* = NA	TDS** = NA Total Organic Carbon* = NA
COD Low** ☐ = 20%	COD High** ☐ = 20%	Nitrate Nitrogen as N** ☐ 20%	Nitrite Nitrogen as N** ☐ = 20%
Hardness* = NA	Sulfate (EPA 300.0)* ☐ = 20%	pH* = NA	TSS* = NA

Other parameter(list) _____ RPD = _____ ☐ RPD limit = _____

Other parameter(list) _____ RPD = _____ ☐ RPD limit = _____

* = Laboratory Limits ** = Olin QAPP Limits

(*MADEP has not yet defined LCS recovery limits for wet chemistry analyses.*)

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20%? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

For TOC

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist. **Yes** [ ] No [✓] N/A [ ] Comments:

8.2 Do any rinsate blanks have positive results? Yes [ ] **No** [ ] N/A [✓] Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

NOTE: *MADEP does not require the collection of rinsate blanks.*

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates. **Yes** [ ] No [✓] N/A [ ] Comments:

9.2 Were field duplicates collected per the required frequency? **Yes** [ ] No [ ] N/A [✓] Comments:

SOW ☐ QAPP ☐ *MADEP Option 1(1 per 20)* ☐ *MADEP Option 3 (1 per 10)* ☐

9.3 Was the RPD ≤ 50% for soils or ≤30% for waters? Calculate the RPD for all results and attach to this review. **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: RPD must be ≤50% for soil or ≤30% water. Qualify data (J) for both sample results if the RPD exceeds limit.

Was any of the data qualified? Yes [✓] **No** [ ] N/A [ ] Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

Blank in Nitrate/Nitrite

Chemist review of % Solid data
Raw data checked confirmed
% Solid Value @ 76%

REFERENCES

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

STL-Westfield, 2002. "Olin – General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - ASTM LEACH

Client Sample ID: OC-SD-EDSD/SW7-XXX
Lab Sample ID: 480-27939-1
Lab Name: TestAmerica Buffalo
Job No.: 480-27939-1
SDG ID.:
Matrix: Solid
Date Sampled: 11/06/2012 09:55
Reporting Basis: WET
Date Received: 11/07/2012 07:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7664-41-7	Ammonia	8.5	4.0	2.0	mg/Kg			1	350.1
14797-65-0	Nitrite as N	ND	0.99	0.0059	mg/Kg		~~H~~	1	353.2
	TOC Result 1	28	20	7.1	mg/Kg			1	9060
	TOC Result 2	27	20	7.1	mg/Kg			1	9060
7440-44-0	Total Organic Carbon - Duplicates	28	20	7.1	mg/Kg			1	9060
14797-55-8	Nitrate as N	~~0.79~~ ND	0.99	0.020	mg/Kg	~~J~~	~~H~~	1	Nitrate by calc

TC
2/26/13

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Buffalo Job No.: 480-27939-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 91190	Date: 11/15/2012 19:56						
300.0	MB 480-91142/2-A	Chloride	ND		mg/Kg	4.2	1
300.0	MB 480-91142/2-A	Sulfate	ND		mg/Kg	17	1
Batch ID: 92907	Date: 11/27/2012 11:41	Prep Batch: 92774	Date: 11/26/2012 17:33				
350.1	MB 480-92774/2-A	Ammonia	ND		mg/Kg	0.20	1
Batch ID: 92982	Date: 11/27/2012 17:30						
350.1	MB 480-90207/2-A	Ammonia	ND		mg/Kg	4.0	1
Batch ID: 91092	Date: 11/15/2012 09:46						
353.2	MB 480-90207/1-A	Nitrate Nitrite as N	0.198	J	mg/Kg	1.0	1
Batch ID: 91609	Date: 11/15/2012 21:45						
9060	MB 480-91609/3	TOC Result 1	ND		mg/Kg	1.0	1
9060	MB 480-91609/3	TOC Result 2	ND		mg/Kg	1.0	1
9060	MB 480-91609/3	Total Organic Carbon - Duplicates	ND		mg/Kg	1.0	1
Batch ID: 91609	Date: 11/16/2012 06:05						
9060	MB 480-90207/4-A	TOC Result 1	ND		mg/Kg	20	1
9060	MB 480-90207/4-A	TOC Result 2	ND		mg/Kg	20	1
9060	MB 480-90207/4-A	Total Organic Carbon - Duplicates	ND		mg/Kg	20	1

0.198 x 5 = 0.99 mg/kg

Qualify Nitrate (U) in sample

OC-SD-EDSD/SW7-XXX

FORM III-IN

TC
3/5/13

Sediment Sample OC-SD-EDSD/SW7-XYY

OLIN-WILMINGTON
CHEMIST REVIEW
STANDARD OPERATING PROCEDURE AND CHECKLIST
N-NITROSODIMETHYLAMINE (NDMA) AND
N-NITROSODI-N-PROPYLAMINE (NDPA) BY METHOD 521

Reviewer/Date Tige Cunningham 2/25/13
Sr. Review/Date
Lab Report # 480-27939-1
Project 61071300 16-10

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Check items received. **Yes** [✓] No [ ] N/A [ ] Comments:

[✓] *Name of Laboratory* [✓] *Address* [✓] *Project ID* [✓] *Phone #* [✓] *Sample identification – Field and Laboratory (IDs must be cross-referenced)*

Client Information: [✓] *Name* [✓] *Address* [✓] *Client Contact*

[✓] Data Package Narrative [✓] results and QC summaries [✓] raw data [✓] chromatograms

ACTION: If no, contact lab for submission of missing or illegible information.

1.1 Laboratory Case Narrative: ***Yes*** [✓] *No* [ ] *N/A* [ ] *Comments:*

[✓] *Narrative serves as an exception report for the project and method QA/QC performance.*

***ACTION**: If no, contact lab for submission of missing or illegible information.*

1.2 Chain of Custody (COC) copy present of completed COC? **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include a copy of the completed Chain of Custody forms containing all samples in this SDG?

ACTION: If no, contact lab for submission of missing completed *COC*.

1.3 Sample Receipt Information (*Cooler Receipt Form*): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory? **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☑ Container type noted ☑ Condition observed ☑ Field and lab IDs cross referenced documentation.

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.3.1 Were the correct bottles and preservatives used? **Yes** [ ] No [ ] N/A [ ] Comments:

Water - 1 Liter amber bottle cool to 4°C. Sodium thiosulfate may be added if source is chlorinated.

1 8oz Amber Jar

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) if cooler temperature exceeds 10°C or use professional judgment for data rejection.

1.3.2 Were all samples delivered to the laboratory without breakage? **Yes** [✓] No [ ] N/A [ ] Comments:

1.3.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? Yes [ ] **No** [✓] N/A [ ] Comments:

1.4 Sample Results Section: *Was the following information supplied in the laboratory report for each sample?* **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Field ID and Lab ID ☑ *Date and time collected* ☑ Analyst Initials ☑ *Dilution Factor* ☑ *Reporting limits*
☑ Analysis method ☑ *Preparation method* ☑ *Date of preparation/extraction/ and analysis,* ☑ Matrix ☑ Target analytes and concentrations ☑ Units

ACTION: If no, contact lab for submission of missing or incomplete information.

1.5 QA/QC Information: Was the following information provided in the laboratory report for each sample batch?

Yes [✓] No [ ] Comments:

☑ Method blank results ☑ LCS recoveries ☑ MS/MSD recoveries and RPDs ☑ Internal Standard Recoveries

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 <u>Holding Times</u> Yes [ ] **No** [✓] N/A [ ] Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded?

NOTE: For water samples, the holding time is 7 days from sampling to extraction and 40 days from extraction to analysis.
* Sediment Hold time 14 days to Extract 40 days to analysis *

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. For soil samples professional judgement will be used to determine if rejection is necessary.

3.0 Laboratory Method Yes [✓] No [ ] N/A [ ] Comments:

3.1 Was the correct laboratory method used?

Water Extraction 3510C or *3520C*
NDMA and NDPA 521

Sediment extraction Method: 3550B Ultrasonic Extraction

ACTION: If no, contact project manager to inform Client of change; request variance from Client; contact laboratory to provide justification for method change compared to the requested method.

3.2 Are the practical quantitation limits the same as those specified by the ☑ QAPP Yes [✓] No [ ] N/A [ ] Comments:

NOTE: *The project PQL is 2 ng/L for GW and 5 ng/L for SW.*

QApp Limit = 5ng/kg

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

Final Volume of Sample extract ~~of sample~~ TC was 3ml's for OC-SD-EDSD/SW7-xxx, elevated from 0.5mL due to interferents and matrix effects.

3.3 Did the laboratory complete a mulit-point initial calibration with a NDMA ~~RPD~~ % RSD ≤ 20? Is NDPA ~~RPD~~ % RSD ≤ 30? Is the low point standard equal to the PQL? **Yes** [ ] No [✓] Comments: multipoint I-Cal used. Quadratic Regression used RRF RSD = 22.4/20.8 calculated

Has a second source standard been analyzed to verify initial calibration? Is the percent difference < 25? **Yes** [✓] No [ ]

3.4 Did the laboratory analyze a continuing calibration every 12 hours or every 20 samples? Was the NDMA recovery 80-120 percent (percent difference ≤ 20)? Was the NDPA recovery 70 -130 percent (percent difference ≤ 30)? **Yes** [✓] No [ ]

3.5 Is the RRT in the CCAL ± 0.06 min from ICAL? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact the lab for submission.

4.0 **Method Blanks**

4.1 Is the Method Blank Summary present? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 For the analysis of NDMA, has a method blank been analyzed for each analysis batch of field samples of 20 or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? **Yes** [✓] No [ ] N/A [ ] Comments:

4.4 Do any method blanks have positive results for NDMA parameters? Qualify data according to the following: Yes [ ] **No** [✓] N/A [ ] Comments:

For NDMA contaminants:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

5.0 Laboratory Control Sample

5.1 Was a laboratory control sample extracted and run with each analytical batch of 20 samples or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgment to determine the usability of sample results associated with that batch.

5.2 Is a LCS Summary Form present? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of control limits? Yes [ ] **No [✓]** N/A [ ] Comments:

NOTE: QAPP LCS recovery limits 60-140.

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit but > 10%, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project specified MS/MSDs analyzed? List project samples that were spiked. **Yes [✓]** No [ ] N/A [ ] Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the MS/MSD recovery form present? **Yes [✓]** No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix? **Yes [✓]** No [ ] N/A [ ] Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.4 Are any NDMA spike recoveries outside of the QC limits? Yes [ ] No [✓] N/A [ ] Comments:

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$

Where: SSR = Spiked sample result SA = Spike added
SR = Sample result

NDMA = 80%

NOTE: *QAPP MS/MSD recovery limits are 60-140.*
NOTES: 1) Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: Professional judgment used to qualify associated samples. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify both positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where: S = MS sample result
D = MSD sample result

NOTE: *QAPP MS/MSD RPD limits for water ≤ 20.*

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Isotope IS Recoveries

Were internal recoveries outside of laboratory limits for any sample or method blank? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: *Lab IS recovery limits 25 -150.*

ACTION: If recoveries are <10% and sample extracts were not diluted, reject non-detects and qualify positive detections as estimated (J). For recoveries outside the lab QC limit, qualify non-detects and positives (J).

8.0 Sampling Accuracy

If ground water samples are collected directly from a tap, process stream, or with dedicated tubing, rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples. **Yes** [ ] No [✓] N/A [ ] Comments:

8.2 Do any rinsate blanks have positive results? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of the samples and their associated field duplicates. **Yes** [ ] No [✓] N/A [ ] Comments:

9.2 Was the RPD ≤ 30% for waters? Calculate the RPD for all results and attach to this review. **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: RPD must be ≤30% for water. Qualify data (J) for both sample results if the RPD exceeds 30%.

10.0 Calculation and Transcription Checks

- [✓] Initial Calibration Reviewed
- [✓] Continuing Calibration
- [✓] Method Blank Raw Data Reveiw
- [✓] Sample NDMA and NDPA Results
- [✓] LCS
- [✓] Internal Standard Recovery

REFERENCES

MACTEC, 2009, "Project Operation Plan Volume III-B Quality Assurance Project Plan, Olin Wilmington Superfund Site, 51 Eames Street, Wilmington, MA", April 2009.

U.S. Environmental Protection Agency (USEPA), 1996. "Region 1 EPA-NE Data Validation Guidelines For Evaluating Environmental Analyses"; Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December 1996.

FORM VI
LCMS INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica West Sacramento Job No.: 480-27939-1 Analy Batch No.: 5732

SDG No.:

Instrument ID: IT1 GC Column: VF-624MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/03/2012 17:39 Calibration End Date: 11/04/2012 00:39 Calibration ID: 1564

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD01 320-5732/4	CS-1...1.0pg-uL,
Level 2	STD02 320-5732/5	CS-2...2.0pg-uL,
Level 3	STD03 320-5732/6	CS-3...5.0pg-uL,
Level 4	STD04 320-5732/7	CS-4...10pg-uL,
Level 5	STD05 320-5732/8	CS-5...20pg-uL,
Level 6	STD06 320-5732/9	CS-6...50pg-uL,
Level 7	STD07 320-5732/10	CS-7...100pg-uL,
Level 8	STD08 320-5732/11	CS-8...200pg-uL,

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5		B	M1	M2								
N-Nitrosodimethylamine	2798.0 5059.3	3116.5 5203.3	4104.0 5297.1	4019.3	4928.7	Q2ID	-0.808	2.0900	0.0024						0.9940		0.9900
N-Nitrosomethylethylamine	4817.0 5784.0	4648.0 5582.2	4818.8 5870.3	5161.8	5470.1	AveID		2.4715				8.3		30.0			
N-Nitrosodiethylamine	2518.0 1971.1	2211.0 1836.8	2166.8 1799.1	2248.6	2214.1	AveID		0.9987				14.0		30.0			
N-Nitrosodi-n-propylamine	7052.0 5896.3	5618.5 5246.6	6401.4 5171.6	5448.3	6110.3	L2ID	0.1327	1.3087							0.9980		0.9900
N-Nitrosopyrrolidine	9342.0 6972.8	7889.0 6257.0	7044.8 5822.9	7366.1	7833.2	AveID		1.6692				10.0		30.0			
N-Nitrosopiperidine	14417 12981	11576 12491	13292 12680	12728	12236	AveID		2.9351				6.6		30.0			
N-Nitrosodi-n-butylamine	7715.0 4925.7	5508.0 4488.3	5885.6 4127.2	5563.4	5418.2	AveID		1.2416				15.0		30.0			
N-Nitrosodimethylamine-d6	0.2190 0.2614	0.2200 0.2335	0.2548 0.2338	0.2282	0.2276	Ave		0.2348				6.6		40.0			
N-Nitrosodi-n-propylamine-d14	0.5219 0.4743	0.4674 0.4695	0.5093 0.4402	0.4516	0.5100	Ave		0.4805				6.2		40.0			

Avg RRF for NDMA 4315
%RSD = 22.4 see attached Excel for calculation check

2/25/13

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

Olin Level I
Calculations
NDMA SDG 480-27937-1 and 480-27939-1
OU2 SW and SD
Olin

12/4/2012	RRF									
Analyte	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	**Ave.**	**%SD**	**%RSD**
NDMA	2273	3796	4667	4513	4784	5284	6069	4483.714286	119989.0	26.8

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica West Sacramento Job No.: 480-27939-1

SDG No.:

Lab Sample ID: ICV 320-6853/12 Calibration Date: 12/04/2012 21:12

Instrument ID: IT1 Calib Start Date: 12/04/2012 14:25

GC Column: VF-624MS ID: 0.25(mm) Calib End Date: 12/04/2012 20:21

Lab File ID: 2nd Source.10pg-uL, 12-4-2012, Conc. Units: pg/uL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
N-Nitrosodimethylamine	L2ID		2.427		10.2	10.0	2.0	25.0
N-Nitrosomethylethylamine	AveID	3.184	3.205		10.1	10.0	0.7	25.0
N-Nitrosodiethylamine	AveID	1.506	1.717		11.4	10.0	14.0	25.0
N-Nitrosodi-n-propylamine	AveID	1.342	1.544		11.5	10.0	15.1	25.0
N-Nitrosopyrrolidine	AveID	1.416	1.544		10.9	10.0	9.1	25.0
N-Nitrosopiperidine	AveID	2.580	2.827		11.0	10.0	9.6	25.0
N-Nitrosodi-n-butylamine	AveID	1.151	1.294		11.2	10.0	12.5	25.0

Area = 48294 / RF 4483 = 10.77 ng/ml OK

Quadratic Used

10.2 / 10 - 1 = 2%

TC
2/25/13

Report Date: 05-Dec-2012 12:53:46 Chrom Revision: 2.1 03-Dec-2012 11:37:40

TestAmerica West Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121204-1670.b\480-27939-1, 12-5-2012, 12-35-33 AM.d		
Lims ID:	480-27939-I-1-A	Client ID:	OC-SD-EDSD/SW7-XXX
Inject. Date:	05-Dec-2012 00:35:34	Dil. Factor:	1.0000
Sample Type:	Client		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	6853	Lims Sample ID:	16
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20121204-1670.b\NDMA_IT1.m		
Last Update:	05-Dec-2012 12:53:46	Calib Date:	04-Dec-2012 20:21:32
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121204-1670.b\CS-8...200pg-uL, 12-4-2012, 8-21-31 PM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	XAWRK025		

First Level Reviewer: nihartv Date: 05-Dec-2012 12:53:46

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.150	12.212	-0.062	76	111492	42.3	100.0- 100.0	100.0		
81	12.141	12.212	-0.071		64905		303.0- 303.0	58.2		
2 N-Nitrosodimethylamine										M
43	12.268	12.263	0.005	1	3451		100.0- 100.0	100.0	-0.1	M
47	12.124	12.263	-0.139		1828		70.8- 70.8	53.0		M
	Summary Peak				5279	1.74				
* 5 2-Chloropyridine										s
110	16.861	16.871	-0.010	82	891958	66.7	100.0- 100.0	100.0		
116	16.861	16.871	-0.010		773938		83.2- 83.2	86.8		
D 6 N-Nitrosodi-n-propylamine-d14										
97	20.788	20.798	-0.010	81	177538	22.6				
8 N-Nitrosopyrrolidine										
55	21.829	21.787	0.042	17	106251	14.1			Infinity	
9 N-Nitrosopiperidine										
68	22.668	22.712	-0.044	39	28426	2.07			651	

QC Flag Legend

Processing Flags
s - Failed ISTD Recovery Test

Review Flags
M - Manually Integrated

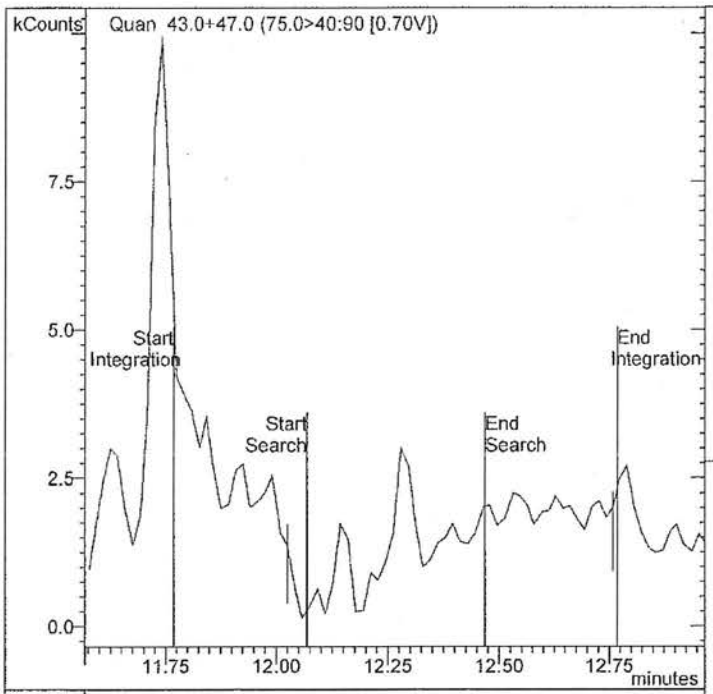
ND

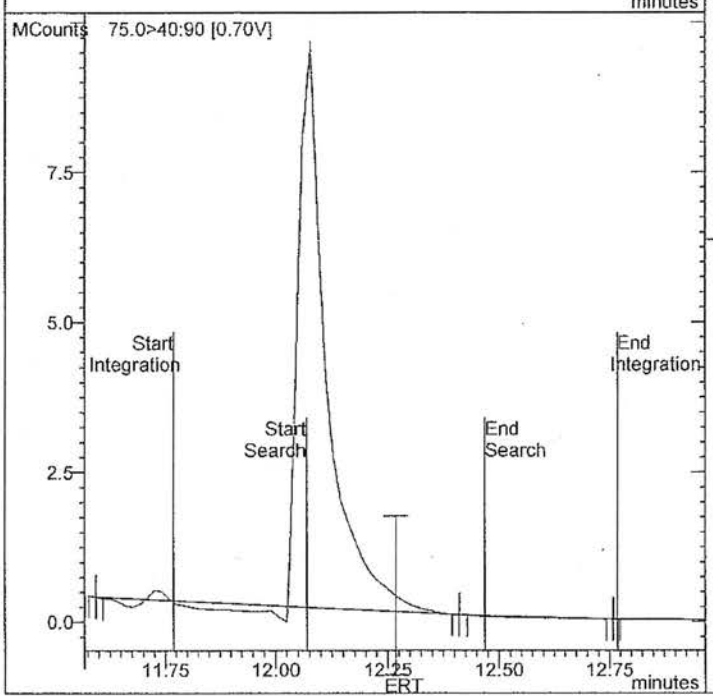
TC
2/25/13

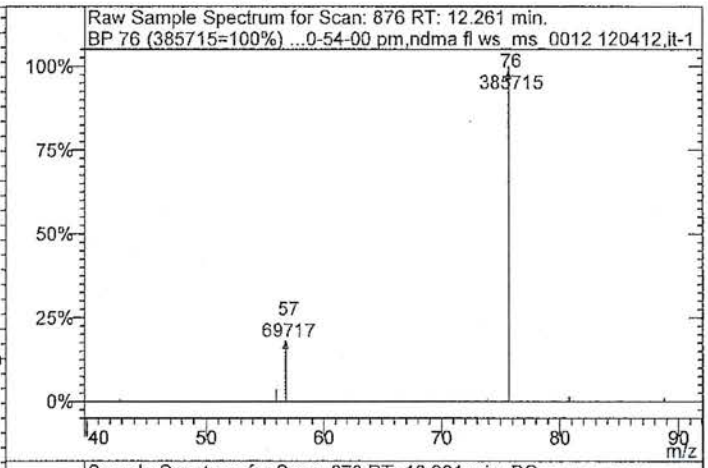
TestAmerica West Sacramento Nitrosamines by GC/CI/MS/MS

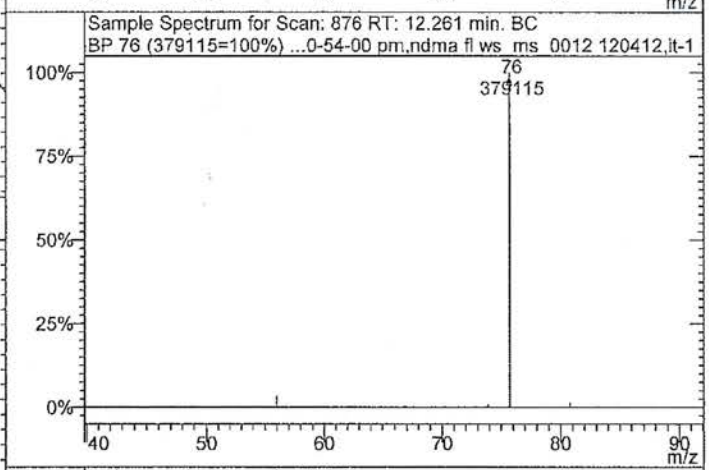
Sample ID:	Batch 5975 MB	Operator:	vmn
Instrument ID:	IT-1 (Ion Trap)	Acquisition Date:	12/4/2012 10:54 PM
Data File:	...,it-1 (ion trap).sms	Method:	...s_ms_0012 120412.mth
Inj. Sample Notes:	MB 320-5975/1, 10g		

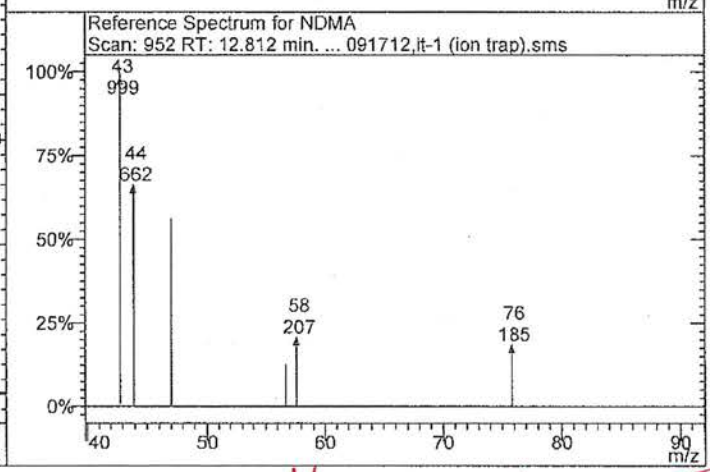
Parameter	Specification	Actual	Status
Compound Number		3	
Retention Time	12.268 +/- 0.200	12.268 min.	Fail
Peak Name		NDMA	
Quan Ions	43.0+47.0		
Area	>=100	0	Fail
Amount	>= 0.000 ng/L	0.000 ng/L	
Calibration Equation	Linear, Ignore, 1/X2	y = +1.0911x -0.0050	
IS Peak Name		NDMA-d6 (IS)	











Seg 2, NDMA / NDMA-d6, Time: 10.00-13.50, CI-Auto-MRM, First Precursor: 75.0

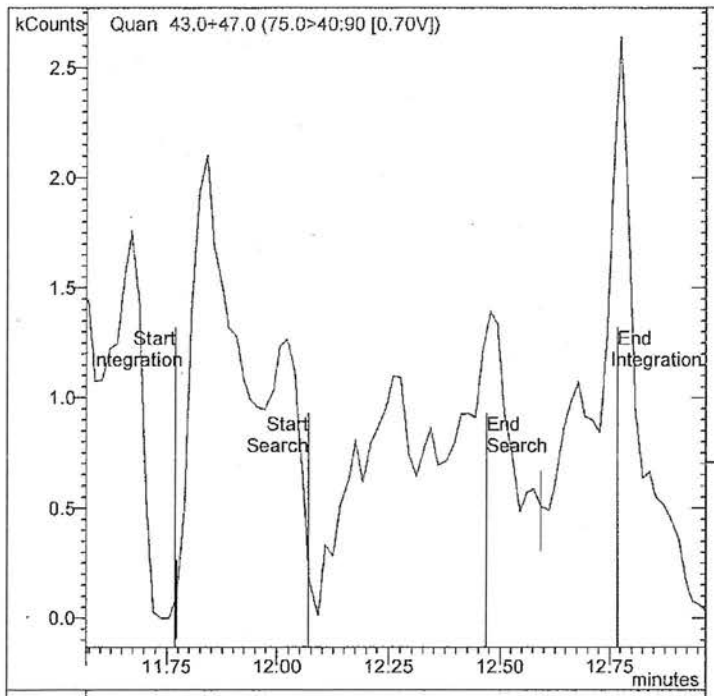
Provided by Lab on 2/22/13

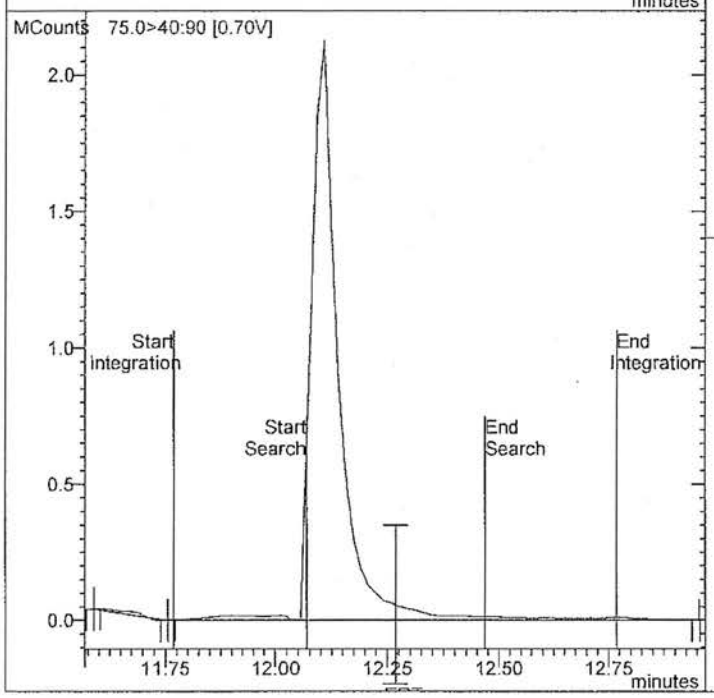
TC 2/25/13

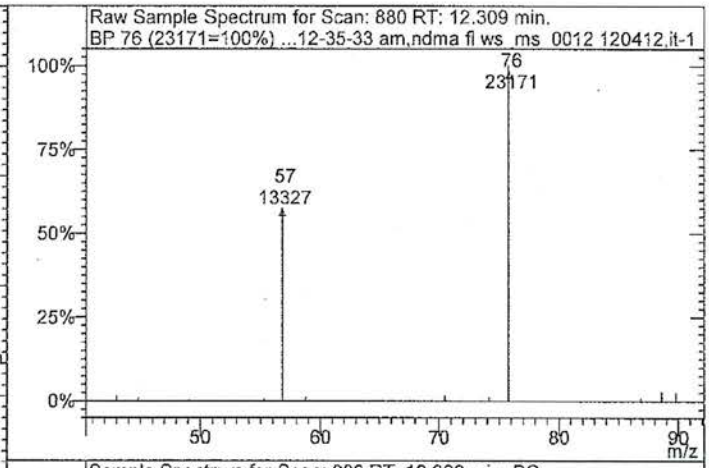
TestAmerica West Sacramento Nitrosamines by GC/CI/MS/MS

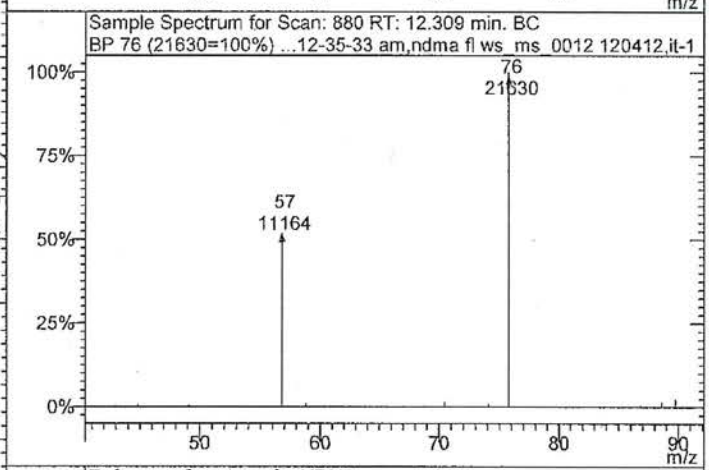
Sample ID:	480-27939-1	Operator:	vmn
Instrument ID:	IT-1 (Ion Trap)	Acquisition Date:	12/5/2012 12:35 AM
Data File:	...,it-1 (ion trap).sms	Method:	...s_ms_0012 120412.mth
Inj. Sample Notes:	480-27939-1, 9.33g		

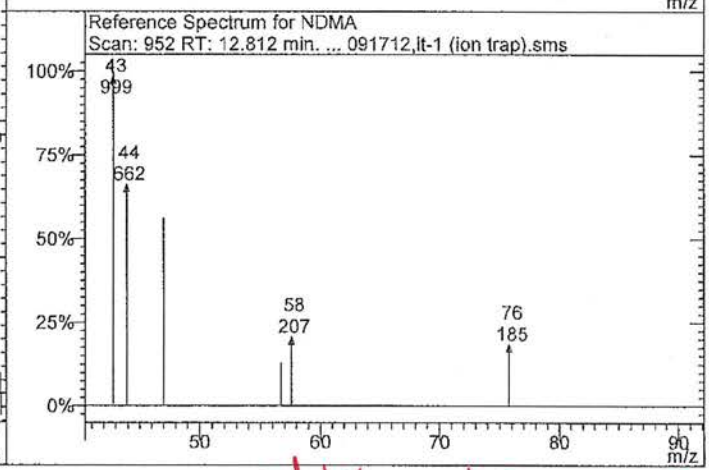
Parameter	Specification	Actual	Status
Compound Number		3	
Retention Time	12.268 +/- 0.200	12.268 min.	Fail
Peak Name		NDMA	
Quan Ions	43.0+47.0		
Area	>=100	0	Fail
Amount	>= 0.000 ng/L	0.000 ng/L	
Calibration Equation	Linear, Ignore, 1/X2	y = +1.0911x -0.0050	
IS Peak Name		NDMA-d6 (IS)	











Seg 2, NDMA / NDMA-d6, Time: 10.00-13.50, CI-Auto-MRM, First Precursor: 75.0

Provided by Lab on 2/22/13

TC 2/25/13

CHEMIST REVIEW-VALIDATION CHECKLIST

Project: Olin Chemical Superfund Site
Project #: 6107130016.01.10
Date: 2/20/2013

Method: Phthalic Acid/Phthalic Anhydride
Laboratory and SDG: TAL 480-27939-1
Reviewer:

☐ **Chemist Review** ☑**Full Validation (add page 2)**

1. **Case Narrative and Data Package Completeness (COC Review)**

   Present and complete.

2. **Holding Time and Sample Preservation/Collection (aqueous 7 days to extraction/40 days to analysis, soil 14 days to extraction/40 days to analysis)**

   All criteria met.

3. **QC Blanks**

   All non detect.

4. **Laboratory Control Sample Review (% recovery 70-130, RPD 20)**

   All criteria met.

5. **Field Duplicate Precision (RPD 30)**

   Not applicable.

6. **Lab Duplicate Precision (RPD 20)**

   All criteria met, LCS/LCSD.

7. **Matrix Spike Results (if applicable) (% recovery 70-130, RPD 20)**

   Sample OC-SD-EDSD/SW7-XXX was submitted for MS/MSD analysis. The MS/MSD percent recovery for phthalic acid/phthalic anhydride (67 and 65) were less than the lower QC limit of 70. The reporting limit for phthalic acid/phthalic anhydride in sample OC-SD-EDSD/SW7-XXX was qualified estimated (UJ).

8. **Surrogate Recovery (if applicable)**

   Not applicable.

9. **Internal Standard Recovery (if applicable)**

   Not applicable.

10. **Initial and Continuing Calibration**

    All criteria met.

CHEMIST REVIEW-VALIDATION CHECKLIST

FULL VALIDATION CHECKS

Ten Percent of data sets will have full validation checks completed during chemist review.

☑ **Initial Calibration**

☑ **Continuing Calibration Verification**

<u>Transcription and Calculation Checks</u>

☑ **Instrument Calibration**

☑ **Blank Review – raw data/chromatogram check**

☑ **Laboratory Control Sample**

☑ **Matrix Spike**

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Tallahassee | Job No.: 480-27939-1

SDG No.:

Client Sample ID: OC-SD-EDSD/SW7-XXX | Lab Sample ID: 480-27939-1

Matrix: Solid | Lab File ID: 1K15J22.d

Analysis Method: LC65 | Date Collected: 11/06/2012 09:55

Extraction Method: LC65 | Date Extracted: 11/14/2012 10:00

Sample wt/vol: 5.09(g) | Date Analyzed: 11/15/2012 16:28

Con. Extract Vol.: 4.0(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: LC-ANEX ID:

% Moisture: 23.6 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 97541 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
88-99-3 & 85-44	Phthalic Acid/Phthalic anhydride	ND	J	130	5.0

2/28/13

CHEMIST REVIEW-VALIDATION CHECKLIST

Project: Olin Chemical Superfund Site
Project #: 6107130016.01.10
Date: 2/20/2013

Method: Formaldehyde/Acetaldehyde 8315
Laboratory and SDG: TAL 480-27939-1
Reviewer:

☐ **Chemist Review** ☑ **Full Validation (add page 2)**

1. **Case Narrative and Data Package Completeness (COC Review)**

   All criteria met.

2. **Holding Time and Sample Preservation/Collection (aqueous 7 days to analysis)**

   All criteria met.

3. **QC Blanks**

   All non-detect.

4. **Laboratory Control Sample Review (% recovery 70-130, RPD 20)**

   All criteria met.

5. **Field Duplicate Precision (RPD 30)**

   Not applicable.

6. **Lab Duplicate Precision (RPD 20)**

   All criteria met, LCS/LCSD RPD.

7. **Matrix Spike Results (if applicable) (% recovery 70-130, RPD 20)**

   Sample OC-SD-EDSD/SW7-XXX was submitted for MS/MSD analysis. The MS percent recovery for formaldehyde (66) and the MS/MSD percent recovery for acetaldehyde (49 and 46) were less than the lower QC limit of 70. The result for formaldehyde and acetaldehyde in sample OC-SD-EDSD/SW7-XXX was qualified estimated (J).

8. **Surrogate Recovery (if applicable)**

   Not applicable.

9. **Internal Standard Recovery (if applicable)**

   Not applicable.

CHEMIST REVIEW-VALIDATION CHECKLIST

FULL VALIDATION CHECKS

Ten Percent of data sets will have full validation checks completed during chemist review.

☑ **Initial Calibration**

☑ **Continuing Calibration Verification**

<u>Transcription and Calculation Checks</u>

☑ **Instrument Calibration**

☑ **Blank Review – raw data/chromatogram check**

☑ **Laboratory Control Sample**

☑ **Matrix Spike**

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Tallahassee
Job No.: 480-27939-1
SDG No.:
Client Sample ID: OC-SD-EDSD/SW7-XXX
Lab Sample ID: 480-27939-1
Matrix: Solid
Lab File ID: 1K14M20.d
Analysis Method: 8315A
Date Collected: 11/06/2012 09:55
Extraction Method: 8315_S_Prep
Date Extracted: 11/13/2012 07:30
Sample wt/vol: 20.0(g)
Date Analyzed: 11/14/2012 14:00
Con. Extract Vol.: 4.0(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: LC-C18 ID:
% Moisture: 23.6
GPC Cleanup:(Y/N) N
Analysis Batch No.: 97450
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
50-00-0	Formaldehyde	1100	J	130	100
75-07-0	Acetaldehyde	55	J	260	38

2/20/13

CHEMIST REVIEW-VALIDATION CHECKLIST

Project: Olin Chemical Superfund Site
Project #: 6107130016.01.10
Date: 2/19/2013

Method: DMF
Laboratory and SDG: Katahdin WIL28
Reviewer: [illegible]

Chemist Review ☑ **Full Validation (add page 2)**

1. **Case Narrative and Data Package Completeness (COC Review)**

   The case narrative states that the chromatogram of sample OC-SD-EDSD/SW-7XXX was manually integrated for the extraction surrogate diethylformamide, due to negative spikes in the baseline. The case narrative also states that the laboratory analyzed sample OC-SD-EDSD/SW-7XXX as a duplicate for QC purposes.

2. **Holding Time and Sample Preservation/Collection (aqueous 7 days to analysis)**

   All criteria met.

3. **QC Blanks**

   All non-detect.

4. **Laboratory Control Sample Review (% recovery 70-130, RPD 20)**

   All criteria met.

5. **Field Duplicate Precision (RPD 30)**

   Not applicable.

6. **Lab Duplicate Precision (RPD 20)**

   The laboratory analyzed sample OC-SD-EDSD/SW-7XXX as a duplicate. All criteria were met.

7. **Matrix Spike Results (if applicable) (% recovery 70-130, RPD 20)**

   Not applicable.

8. **Surrogate Recovery (if applicable) Limits 70-130%**

   All criteria met.

9. **Internal Standard Recovery (if applicable)**

   Not applicable.

10. **Continuing Calibration**

    All criteria met.

CHEMIST REVIEW-VALIDATION CHECKLIST

FULL VALIDATION CHECKS

Ten Percent of data sets will have full validation checks completed during chemist review.

☑ **Initial Calibration**

☑ **Continuing Calibration Verification**

<u>Transcription and Calculation Checks</u>

☑ **Instrument Calibration**

☑ **Blank Review – raw data/chromatogram check**

☑ **Laboratory Control Sample**

n/a Matrix Spike

KATAHDIN ANALYTICAL SERVICES
Report of Analytical Results

Client: Olin Corporation
Project: RI Analytical - Wilmington
PO No:
Sample Date: 11/06/12
Received Date: 11/09/12
Extraction Date: 11/12/12
Analysis Date: 13-NOV-2012 19:55
Report Date: 11/20/2012
Matrix: SOIL
% Solids: 80.9

Lab ID: WG116361-4
Client ID: OC-SD-EDSD/SW7-XXX
SDG: WIL-28
Extracted by: JLP
Extraction Method: 8033M
Analyst: JLP
Analysis Method: SW846 8033M
Lab Prep Batch: WG116361
Units: mg/Kgdrywt

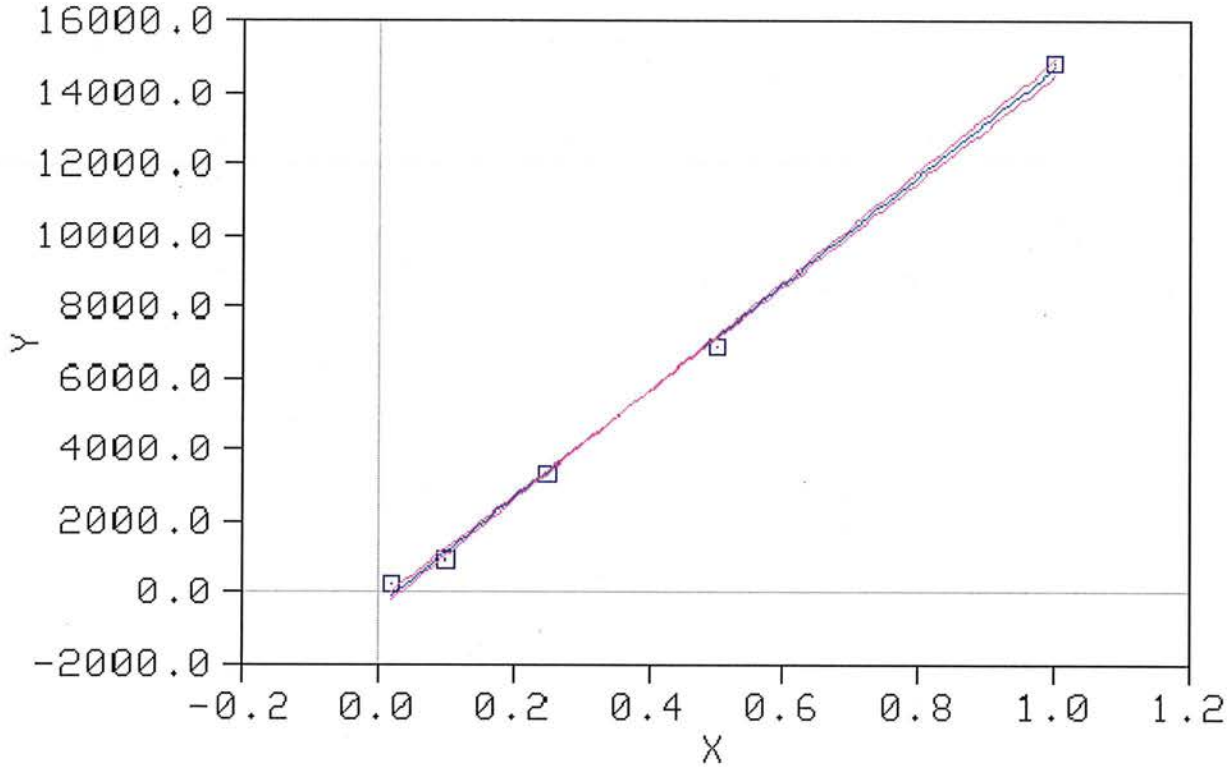
CAS#	Compound	Flags	Results	DF	PQL	Adj.PQL	Adj.MDL
	dimethylformamide	U	0.20	1.0	0.20	0.20	0.13
	diethylformamide		80%				

Page 01 of 01 6FK1046.d

Duplicate

2/19/13

Here are your results:



The blue line is the least squares best fit to the data (points).

The pink lines have slopes 1 sigma away from the best fit. They intersect at the mean of x and y for the data.

number of events entered:	**5**
slope:	**15069.332 +/- 349.749**
y intercept:	**-378.93 +/- 179.90**
dispersion:	**276.17**
correlation coefficient (r):	**1.00**
r^2:	**1.00**
chi ^ 2 (degrees of freedom):	**-1395.656 (3)**

(a)

2/19/13

Return to the main Tool Page

CHEMIST REVIEW-VALIDATION CHECKLIST

Project: Olin Chemical Superfund Site **Method:** SW8315A Hydrazine, MMA, UDMH
Project #: 6107130016.01.10 **Laboratory and SDG:** Lancaster/ OLN 82
Date: 2/19/2013 **Reviewer:** [illegible]

Chemist Review ☑ **Full Validation (add page 2)**

1. **Case Narrative and Data Package Completeness (COC Review)**

   Present and complete.

2. **Holding Time and Sample Preservation/Collection (aqueous 10 days extract, 5 days to analyze, soils 14 days extract, 72 hours analyze)**

   All criteria met.

3. **Continuing Calibration (percent recovery 70 – 130)**

   All criteria met.

4. **QC Blanks**

   All non detect.

5. **Laboratory Control Sample Review (percent recovery 70 – 130, RPD aq. 20, soil 35)**

   All criteria met.

6. **Field Duplicate Precision (RPD = 30 aqueous, 50 soil)**

   Not applicable.

7. **Lab Duplicate Precision (RPD = 20 aqueous)**

   Not applicable.

8. **Matrix Spike Results (if applicable) (percent recovery aqueous = 75 – 125, RPD – 20; soil = 40 - 140, RPD - 50)**

   Not applicable.

9. **Reporting Limits and Data Comparison (PQL = hydr. 0.20 µg/L, 2.0 µg/kg, UDMH/MMH 0.50 µg/L, 5.0 µg/kg)**

   All criteria met.

CHEMIST REVIEW-VALIDATION CHECKLIST

FULL VALIDATION CHECKS

Ten Percent of data sets will have full validation checks completed during chemist review.

☑ **Initial Calibration**

☑ **Continuing Calibration Verification**

Transcription and Calculation Checks

☑ **Instrument Calibration**

☑ **Blank Review – raw data/chromatogram check**

☑ **Laboratory Control Sample**

n/a **Matrix Spike**

VOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / II / III (circle one)

SITE: Olin Chemical Project #: 61071300016 SDG #: 480-30406-1

LAB #: 480-30406-1

Sample IDs: Attach tracking sheet and/or sample listing. OC-SD-SD-503-XXX
OC-SD-SD-502-XXX OC-SD-SD-504-XXX
OC-SD-SD-501-XXX

This checklist is designed to be used with USEPA Region I Validation Guidelines Part II (12/1996). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO	NA		
			Data completeness	
☑	☐	☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑	☐	☐	Data summaries match EDD	
			Holding Times and Preservation	Collected 12/17/12; analyzed 12/19/12
☑	☐	☐	Hold times met (14 days with preservation)	
☑	☐	☐	Preserved (waters HCL, soils methanol)	
			Instrument Performance Check (Tune)	
☑	☐	☐	Tune available for each 12-hour period samples were analyzed	
☑	☐	☐	Appropriate number of significant figures reported (at least 2)	
☑	☐	☐	Mass/Charge list (m/z) criteria met	
			Initial Calibration 12/11/12; 12/17/12	1,4-Dioxane .015; RRF < Reg I control limit .05 but > CLP control limit .05; qualify J/(UJ) based on prof. judgment.
☑	☐	☐	%RSD less than or equal to 30%	
☐	☑	☐	RRF greater than or equal to 0.05	
			Continuing Calibration 12/19/12	1,4-Dioxane .013; as above J/(UJ) all results
☑	☐	☐	%D less than or equal to 25%	
☐	☑	☐	RRF greater than or equal to 0.05.	
			Blank Contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.
☐	☑	☐	Method blank contamination no TCs;	
☐	☐	☑	Trip blank contamination no TCs	
☐	☐	☑	Equipment/Rinseate blank contamination	

VOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / II / III (circle one)

Surrogate Recoveries ☑ ☐ ☐ Surrogates percent recovery criteria met (water and soil: 70%-130%)	
Matrix Spikes and Laboratory Control Samples ☐ ☐ ☑ MS/MSD percent recovery criteria met (water and soil: 70%-130%) ☐ ☐ ☑ MS/MSD RPD criteria met (water and soil <30%) ☐ ☑ ☐ LCS percent recovery criteria (water and soil: 70%-130%)	LCS/LCSD: Bromomethane 67 (70-130) J (UJ) all
Field Duplicates ☐ ☐ ☑ RPD criteria (water <30%, soils <50%) met	
Internal Standard ☑ ☐ ☐ Area counts within -50 to +100 percent of calib. std. ☑ ☐ ☐ Retention Time within 30 seconds of calib. std.	
Target Compounds ☑ ☐ ☐ Reviewed narrative for anomalies	
Tentatively Identified Compounds (TICs) JR ☑ ☑ ☐ TCL compounds reported as TICs JR 2/14/13	

Validator's Signature: Julie Rivard

Date: 2/14/13

Reference:

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-503-XXX**

Lab Sample ID: 480-30406-1

Client Matrix: Solid

% Moisture: 36.1

Date Sampled: 12/17/2012 1430

Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96559	Instrument ID:	HP5973F
Prep Method:	5035	Prep Batch:	480-96598	Lab File ID:	F4461.D
Dilution:	1.0			Initial Weight/Volume:	5.75 g
Analysis Date:	12/19/2012 1754			Final Weight/Volume:	5 mL
Prep Date:	12/19/2012 1330				

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	ND		0.68	3.4
1,1,1-Trichloroethane	ND		0.49	3.4
1,1,2,2-Tetrachloroethane	ND		1.1	3.4
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.6	3.4
1,1,2-Trichloroethane	ND		0.88	3.4
1,1-Dichloroethane	ND		0.83	3.4
1,1-Dichloroethene	ND		0.83	3.4
1,1-Dichloropropene	ND		0.97	3.4
1,2,3-Trichlorobenzene	ND		0.72	3.4
1,2,3-Trichloropropane	ND		0.69	3.4
1,2,4-Trichlorobenzene	ND		0.41	3.4
1,2,4-Trimethylbenzene	ND		1.3	3.4
1,2-Dibromo-3-Chloropropane	ND		3.4	34
1,2-Dichlorobenzene	ND		0.53	3.4
1,2-Dichloroethane	ND		0.34	3.4
1,2-Dichloropropane	ND		3.4	3.4
1,3,5-Trimethylbenzene	ND		0.44	3.4
1,3-Dichlorobenzene	ND		0.35	3.4
1,3-Dichloropropane	ND		0.41	3.4
1,4-Dichlorobenzene	ND		0.95	3.4
1,4-Dioxane	ND J		33	340
2,2-Dichloropropane	ND		1.2	3.4
2,4,4-Trimethyl-1-pentene	2.4	J	0.59	6.8
2,4,4-Trimethyl-2-pentene	1.4	J	0.72	6.8
2-Butanone (MEK)	35		2.5	34
2-Chlorotoluene	ND		0.45	3.4
2-Hexanone	ND		3.4	34
4-Chlorotoluene	ND		0.80	3.4
4-Isopropyltoluene	ND		0.55	3.4
4-Methyl-2-pentanone (MIBK)	ND		2.2	34
Acetone	150	J	5.7	340
Benzene	ND		0.33	3.4
Bromobenzene	ND		1.2	3.4
Bromoform	ND		3.4	3.4
Bromomethane	ND J	*	0.61	6.8
Carbon disulfide	ND		3.4	3.4
Carbon tetrachloride	ND		0.66	3.4
Chlorobenzene	ND		0.90	3.4
Chlorobromomethane	ND		0.49	3.4
Chlorodibromomethane	ND		0.87	3.4
Chloroethane	ND		1.5	6.8
Chloroform	ND		0.42	3.4
Chloromethane	ND		0.41	6.8
cis-1,2-Dichloroethene	ND		0.87	3.4
cis-1,3-Dichloropropene	ND		0.98	3.4
Cyclohexane	ND		0.95	34

JR 2/14/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-503-XXX**

Lab Sample ID: 480-30406-1
Client Matrix: Solid
% Moisture: 36.1

Date Sampled: 12/17/2012 1430
Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96559	Instrument ID:	HP5973F
Prep Method:	5035	Prep Batch:	480-96598	Lab File ID:	F4461.D
Dilution:	1.0			Initial Weight/Volume:	5.75 g
Analysis Date:	12/19/2012 1754			Final Weight/Volume:	5 mL
Prep Date:	12/19/2012 1330				

Tentatively Identified Compounds **Number TIC's Found:** 2

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
~~556-67-2~~	~~Cyclotetrasiloxane, octamethyl-~~	~~9.54~~	~~9.5~~	~~T J N~~ GC/MS artifact
119209-20-0	Decane, 5,6-dipropyl-	9.85	120	T J N

2/14/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-504-XXX**

Lab Sample ID: 480-30406-2

Client Matrix: Solid

% Moisture: 43.7

Date Sampled: 12/17/2012 1500

Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96559	Instrument ID:	HP5973F
Prep Method:	5035	Prep Batch:	480-96598	Lab File ID:	F4462.D
Dilution:	1.0			Initial Weight/Volume:	5.89 g
Analysis Date:	12/19/2012 1820			Final Weight/Volume:	5 mL
Prep Date:	12/19/2012 1330				

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	ND		0.75	3.8
1,1,1-Trichloroethane	ND		0.55	3.8
1,1,2,2-Tetrachloroethane	ND		1.2	3.8
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.7	3.8
1,1,2-Trichloroethane	ND		0.98	3.8
1,1-Dichloroethane	ND		0.92	3.8
1,1-Dichloroethene	ND		0.92	3.8
1,1-Dichloropropene	ND		1.1	3.8
1,2,3-Trichlorobenzene	ND		0.80	3.8
1,2,3-Trichloropropane	ND		0.77	3.8
1,2,4-Trichlorobenzene	ND		0.46	3.8
1,2,4-Trimethylbenzene	ND		1.4	3.8
1,2-Dibromo-3-Chloropropane	ND		3.8	38
1,2-Dichlorobenzene	ND		0.59	3.8
1,2-Dichloroethane	ND		0.38	3.8
1,2-Dichloropropane	ND		3.8	3.8
1,3,5-Trimethylbenzene	ND		0.49	3.8
1,3-Dichlorobenzene	ND		0.39	3.8
1,3-Dichloropropane	ND		0.45	3.8
1,4-Dichlorobenzene	ND		1.1	3.8
1,4-Dioxane	ND J		36	380
2,2-Dichloropropane	ND		1.3	3.8
2,4,4-Trimethyl-1-pentene	7.8		0.65	7.5
2,4,4-Trimethyl-2-pentene	3.9	J	0.80	7.5
2-Butanone (MEK)	33	J	2.8	38
2-Chlorotoluene	ND		0.49	3.8
2-Hexanone	ND		3.8	38
4-Chlorotoluene	ND		0.89	3.8
4-Isopropyltoluene	ND		0.60	3.8
4-Methyl-2-pentanone (MIBK)	ND		2.5	38
Acetone	130	J	6.4	380
Benzene	ND		0.37	3.8
Bromobenzene	ND		1.3	3.8
Bromoform	ND		3.8	3.8
Bromomethane	ND J	*	0.68	7.5
Carbon disulfide	ND		3.8	3.8
Carbon tetrachloride	ND		0.73	3.8
Chlorobenzene	ND		1.0	3.8
Chlorobromomethane	ND		0.54	3.8
Chlorodibromomethane	ND		0.97	3.8
Chloroethane	ND		1.7	7.5
Chloroform	ND		0.47	3.8
Chloromethane	ND		0.46	7.5
cis-1,2-Dichloroethene	ND		0.97	3.8
cis-1,3-Dichloropropene	ND		1.1	3.8
Cyclohexane	ND		1.1	38

JC 2/14/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-501-XXX**

Lab Sample ID: 480-30406-3

Client Matrix: Solid

% Moisture: 28.5

Date Sampled: 12/17/2012 1215

Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96559	Instrument ID:	HP5973F
Prep Method:	5035	Prep Batch:	480-96598	Lab File ID:	F4463.D
Dilution:	1.0			Initial Weight/Volume:	6.89 g
Analysis Date:	12/19/2012 1846			Final Weight/Volume:	5 mL
Prep Date:	12/19/2012 1330				

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	ND		0.51	2.5
1,1,1-Trichloroethane	ND		0.37	2.5
1,1,2,2-Tetrachloroethane	ND		0.82	2.5
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.2	2.5
1,1,2-Trichloroethane	ND		0.66	2.5
1,1-Dichloroethane	ND		0.62	2.5
1,1-Dichloroethene	ND		0.62	2.5
1,1-Dichloropropene	ND		0.72	2.5
1,2,3-Trichlorobenzene	ND		0.54	2.5
1,2,3-Trichloropropane	ND		0.52	2.5
1,2,4-Trichlorobenzene	ND		0.31	2.5
1,2,4-Trimethylbenzene	ND		0.97	2.5
1,2-Dibromo-3-Chloropropane	ND		2.5	25
1,2-Dichlorobenzene	ND		0.40	2.5
1,2-Dichloroethane	ND		0.25	2.5
1,2-Dichloropropane	ND		2.5	2.5
1,3,5-Trimethylbenzene	ND		0.33	2.5
1,3-Dichlorobenzene	ND		0.26	2.5
1,3-Dichloropropane	ND		0.30	2.5
1,4-Dichlorobenzene	ND		0.71	2.5
1,4-Dioxane	ND J		24	250
2,2-Dichloropropane	ND		0.86	2.5
2,4,4-Trimethyl-1-pentene	ND		0.44	5.1
2,4,4-Trimethyl-2-pentene	ND		0.54	5.1
2-Butanone (MEK)	27		1.9	25
2-Chlorotoluene	ND		0.33	2.5
2-Hexanone	ND		2.5	25
4-Chlorotoluene	ND		0.60	2.5
4-Isopropyltoluene	ND		0.41	2.5
4-Methyl-2-pentanone (MIBK)	ND		1.7	25
Acetone	120	J	4.3	250
Benzene	ND		0.25	2.5
Bromobenzene	ND		0.89	2.5
Bromoform	ND		2.5	2.5
Bromomethane	ND J	*	0.46	5.1
Carbon disulfide	ND		2.5	2.5
Carbon tetrachloride	ND		0.49	2.5
Chlorobenzene	ND		0.67	2.5
Chlorobromomethane	ND		0.37	2.5
Chlorodibromomethane	ND		0.65	2.5
Chloroethane	ND		1.1	5.1
Chloroform	ND		0.31	2.5
Chloromethane	ND		0.31	5.1
cis-1,2-Dichloroethene	ND		0.65	2.5
cis-1,3-Dichloropropene	ND		0.73	2.5
Cyclohexane	ND		0.71	25

JR 2/14/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-501-XXX**

Lab Sample ID: 480-30406-3

Client Matrix: Solid

% Moisture: 28.5

Date Sampled: 12/17/2012 1215

Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96559	Instrument ID:	HP5973F
Prep Method:	5035	Prep Batch:	480-96598	Lab File ID:	F4463.D
Dilution:	1.0			Initial Weight/Volume:	6.89 g
Analysis Date:	12/19/2012 1846			Final Weight/Volume:	5 mL
Prep Date:	12/19/2012 1330				

Tentatively Identified Compounds **Number TIC's Found:** 2

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
~~556-67-2~~	~~Cyclotetrasiloxane, octamethyl-~~	~~9.54~~	~~8.2~~	~~T J N~~ GC/MS artifact
473-19-8	Bicyclo[2.2.1]heptane, 2,2,3-trimethyl-	10.03	13	T J N

2/14/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-502-XXX**

Lab Sample ID: 480-30406-4

Client Matrix: Solid

% Moisture: 30.6

Date Sampled: 12/17/2012 1245

Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96559	Instrument ID:	HP5973F
Prep Method:	5035	Prep Batch:	480-96598	Lab File ID:	F4464.D
Dilution:	1.0			Initial Weight/Volume:	6.25 g
Analysis Date:	12/19/2012 1911			Final Weight/Volume:	5 mL
Prep Date:	12/19/2012 1330				

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	ND		0.58	2.9
1,1,1-Trichloroethane	ND		0.42	2.9
1,1,2,2-Tetrachloroethane	ND		0.93	2.9
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.3	2.9
1,1,2-Trichloroethane	ND		0.75	2.9
1,1-Dichloroethane	ND		0.70	2.9
1,1-Dichloroethene	ND		0.71	2.9
1,1-Dichloropropene	ND		0.82	2.9
1,2,3-Trichlorobenzene	ND		0.61	2.9
1,2,3-Trichloropropane	ND		0.59	2.9
1,2,4-Trichlorobenzene	ND		0.35	2.9
1,2,4-Trimethylbenzene	ND		1.1	2.9
1,2-Dibromo-3-Chloropropane	ND		2.9	29
1,2-Dichlorobenzene	ND		0.45	2.9
1,2-Dichloroethane	ND		0.29	2.9
1,2-Dichloropropane	ND		2.9	2.9
1,3,5-Trimethylbenzene	ND		0.37	2.9
1,3-Dichlorobenzene	ND		0.30	2.9
1,3-Dichloropropane	ND		0.35	2.9
1,4-Dichlorobenzene	ND		0.81	2.9
1,4-Dioxane	ND J		28	290
2,2-Dichloropropane	ND		0.98	2.9
2,4,4-Trimethyl-1-pentene	11		0.50	5.8
2,4,4-Trimethyl-2-pentene	8.8		0.61	5.8
2-Butanone (MEK)	25	J	2.1	29
2-Chlorotoluene	ND		0.38	2.9
2-Hexanone	ND		2.9	29
4-Chlorotoluene	ND		0.68	2.9
4-Isopropyltoluene	ND		0.46	2.9
4-Methyl-2-pentanone (MIBK)	ND		1.9	29
Acetone	110	J	4.9	290
Benzene	ND		0.28	2.9
Bromobenzene	ND		1.0	2.9
Bromoform	ND		2.9	2.9
Bromomethane	ND J	*	0.52	5.8
Carbon disulfide	ND		2.9	2.9
Carbon tetrachloride	ND		0.56	2.9
Chlorobenzene	ND		0.76	2.9
Chlorobromomethane	ND		0.42	2.9
Chlorodibromomethane	ND		0.74	2.9
Chloroethane	ND		1.3	5.8
Chloroform	ND		0.36	2.9
Chloromethane	ND		0.35	5.8
cis-1,2-Dichloroethene	ND		0.74	2.9
cis-1,3-Dichloropropene	ND		0.83	2.9
Cyclohexane	ND		0.81	29

2/14/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-502-XXX**

Lab Sample ID: 480-30406-4

Client Matrix: Solid

% Moisture: 30.6

Date Sampled: 12/17/2012 1245

Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96559	Instrument ID:	HP5973F
Prep Method:	5035	Prep Batch:	480-96598	Lab File ID:	F4464.D
Dilution:	1.0			Initial Weight/Volume:	6.25 g
Analysis Date:	12/19/2012 1911			Final Weight/Volume:	5 mL
Prep Date:	12/19/2012 1330				

Tentatively Identified Compounds **Number TIC's Found:** 2

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
~~1066-40-6~~	~~Silanol, trimethyl-~~	~~4.48~~	~~6.6~~	~~T J N~~ GCMS artifact
473-19-8	Bicyclo[2.2.1]heptane, 2,2,3-trimethyl-	10.03	7.0	T J N

2/14/13

SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / II / III (circle one)

SITE: Olin Chemical Superfund Site . Project #: 6107130016 SDG #: 480-30406-1

LAB #: 480-30406-1

Sample IDs: Attach tracking sheet and/or sample listing.

OC-SD-SD-503-XXX OC-SD-SD-501-XXX
OC-SD-SD-504-XXX OC-SD-SD-502-XXX

This checklist is designed to be used with USEPA Region I Validation Guidelines Part II (12/1996). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES NO NA	
Data completeness ☑ ☐ ☐ All data summaries, QC forms and raw data available from hard copy or electronic data package ☑ ☐ ☐ Data summaries match EDD	Contact lab if missing data. Lab to respond with 24 hours. NOTE: All samples analyzed @ 10x DL due to sample matrix.
Holding Times and Preservation ☑ ☐ ☐ Hold times met (Waters – Extract within 7 days, analyze within 40 days. Soils – extract within 14 days, analyze within 40 days)	Collected 12/17/12; extracted 12/19/12
Instrument Performance Check (Tune) ☑ ☐ ☐ Tune available for each 12-hour period samples were analyzed ☑ ☐ ☐ Appropriate number of significant figures reported (at least 2) ☑ ☐ ☐ Mass/Charge list (m/z) criteria met	
Initial Calibration 12/18/12 ☑ ☐ ☐ %RSD less than or equal to 30% ☑ ☐ ☐ RRF greater than or equal to 0.05	
Continuing Calibration 12/21/12 ☑ ☐ ☐ %D less than or equal to 25% ☑ ☐ ☐ RRF greater than or equal to 0.05.	
Blank Contamination ☑ ☐ ☐ Method blank contamination See ☐ ☐ ☑ Equipment/Rinseate blank contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.

attached for TICs detected in blank; none detected in samples except unknown @ 4.18-4.22 minutes; deleted from all samples.

SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / II / III (circle one)

Surrogate Recoveries ☑ ☐ ☐ Surrogates percent recovery criteria met: Soil = (base/neutral 30%-130%, acid 30%-130%) Water = (base/neutral 30%-130%, acid 15%-110%)	Surrogates diluted out (10x dilutions for all samples); no action required
Matrix Spikes and Laboratory Control Samples ☐ ☐ ☑ MS/MSD percent recovery criteria met Soil and Water = (base/neutral 40%-140%, acid 30%-130%) ☐ ☐ ☑ MS/MSD RPD criteria met (soils <50%, water <30%) ☐ ☑ ☐ LCS percent recovery criteria met soil/water (base 40%-140%, acid 30%-130%)	LCS/LCSD; J(UJ) 4-nitrophenol 142; RPD=147 J(UJ) 2,4-dinitrophenol RPD = ~~81~~ 74 Azobenzene ~~245/236~~ >. J+ 268/258 (ND) gr 3/12/13*
Field Duplicates ☐ ☐ ☑ RPD criteria met (soils <50%, water <30%)	
Internal Standard ☑ ☐ ☐ Area counts within -50 to +100 percent of calib. std. ☑ ☐ ☐ Retention Time within 30 seconds of calib. std.	
Target Compounds ☑ ☐ ☐ Reviewed narrative for anomalies	(1) Lab reported both 4-methylphenol and 3+4-methylphenol; since QAPP
Tentatively Identified Compounds (TICs) ☐ ☑ ☐ TCL compounds reported as TICs NOTE: An unknown peak at RT 17 minutes is evident in sample OC-SD-S1-S04-xxx(1)	references 3+4 methylphenol the duplicate data reported as 4-MP have been 'refuse flagged' in the database.

Validator's Signature: Julie Mcare (2) Results for NDMA were 'refuse flagged' in the database since reported as method 521 w/ lower RLs.

Date: 2/18/13

(1) but was not selected for TIC evaluation by the lab due to co-elution w/ the Target cmpd Benzo(a) pyrene. See report comments.

(3) 4-Bromophenyl phenyl ether was not included on Form 1s but was included in EDD; results manually written on Form 1s during data validation. gr 3/13/13

Reference:

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

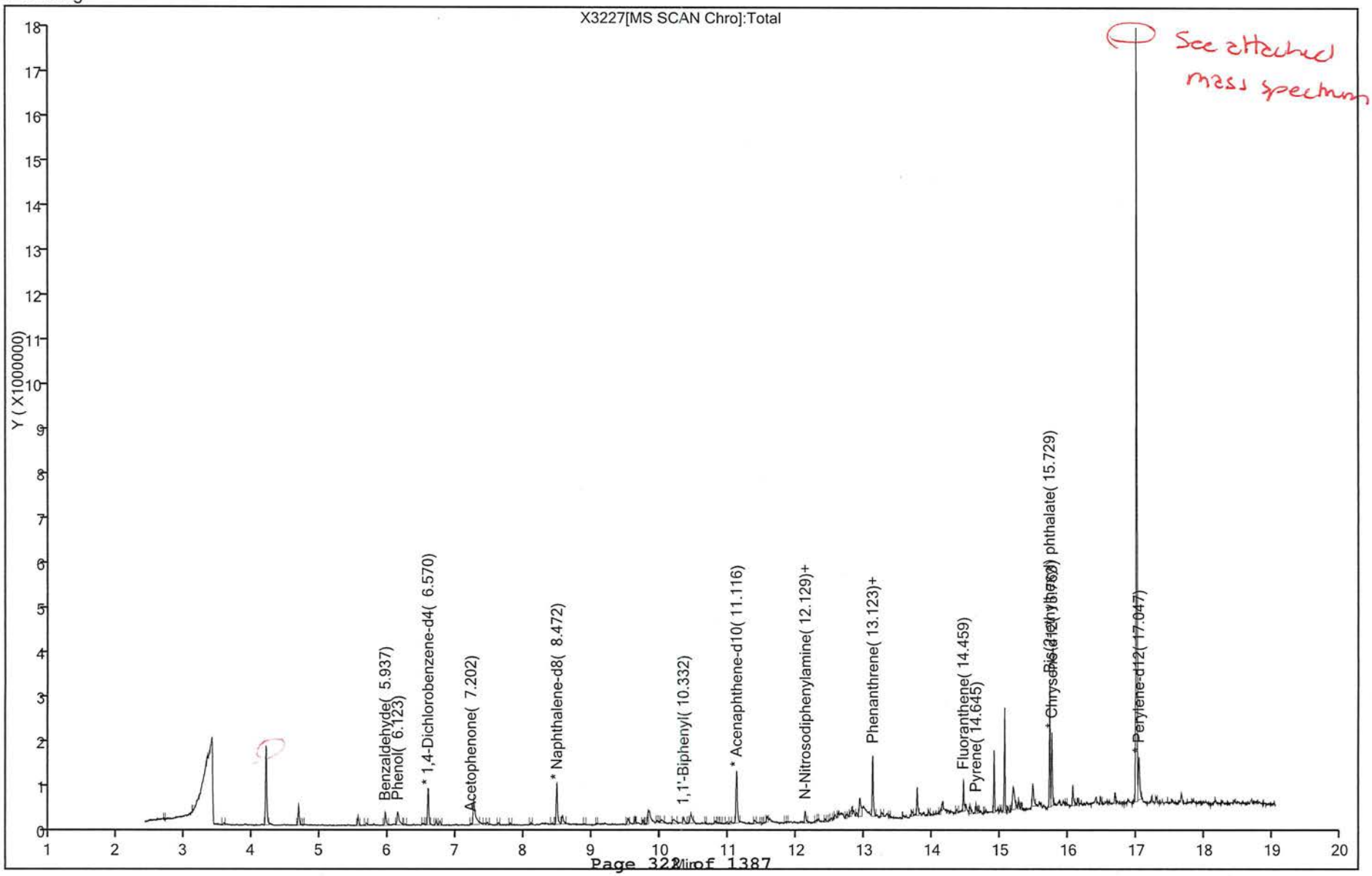
* Sarec revised after re-issue of lab report due to calculation check errors identified during validation.

Report Date: 21-Dec-2012 12:44:15 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo

Data File:	\\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3227.D		
Injection Date:	21-Dec-2012 12:20:30	Limit Group:	MB - 8270RCP_MCP ICAL
Client ID:	OC-SD-SD-503-XXX	Instrument ID:	HP5973X
Lims Batch ID:	97046	Lims Sample ID:	7
Operator ID:	ANM	Injection Vol:	1.0 ul
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm

Y Scaling:



See attached mass spectrum

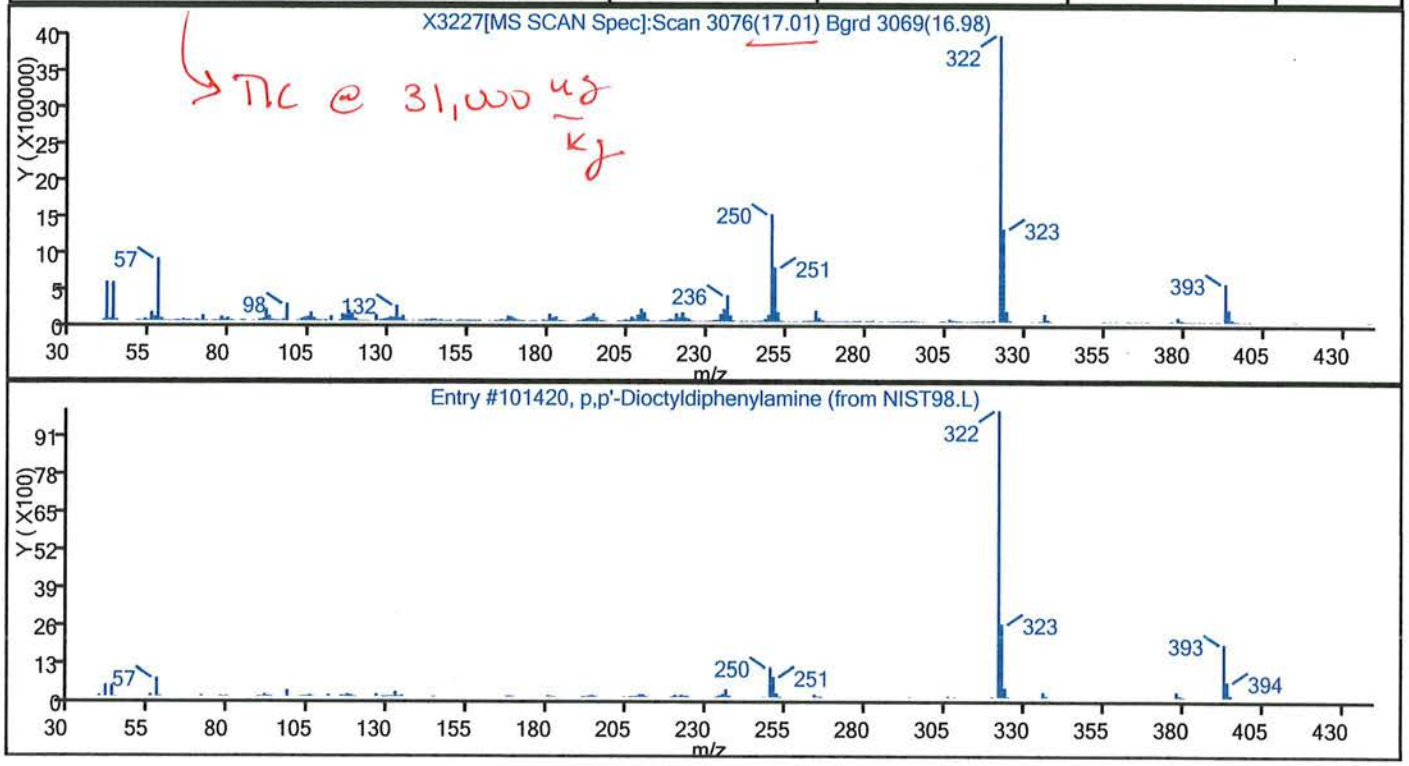
SVOC - 01

Report Date: 01-Mar-2013 16:46:16 Chrom Revision: 2.0 01-Feb-2013 10:03:10

TestAmerica Buffalo

Data File:	\\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3227.D		
Injection Date:	21-Dec-2012 12:20:30	Limit Group:	MB - 8270RCP_MCP ICAL
Client ID:	OC-SD-SD-503-XXX	Instrument ID:	HP5973X
Lims Batch ID:	97046	Lims Sample ID:	7
Operator ID:	ANM	Injection Vol:	1.0 ul
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm

Library Search Compound Match	CAS Number	Library	Entry	Quality
p,p'-Dioctyldiphenylamine	26603-23-6	NIST98.L	101420	96

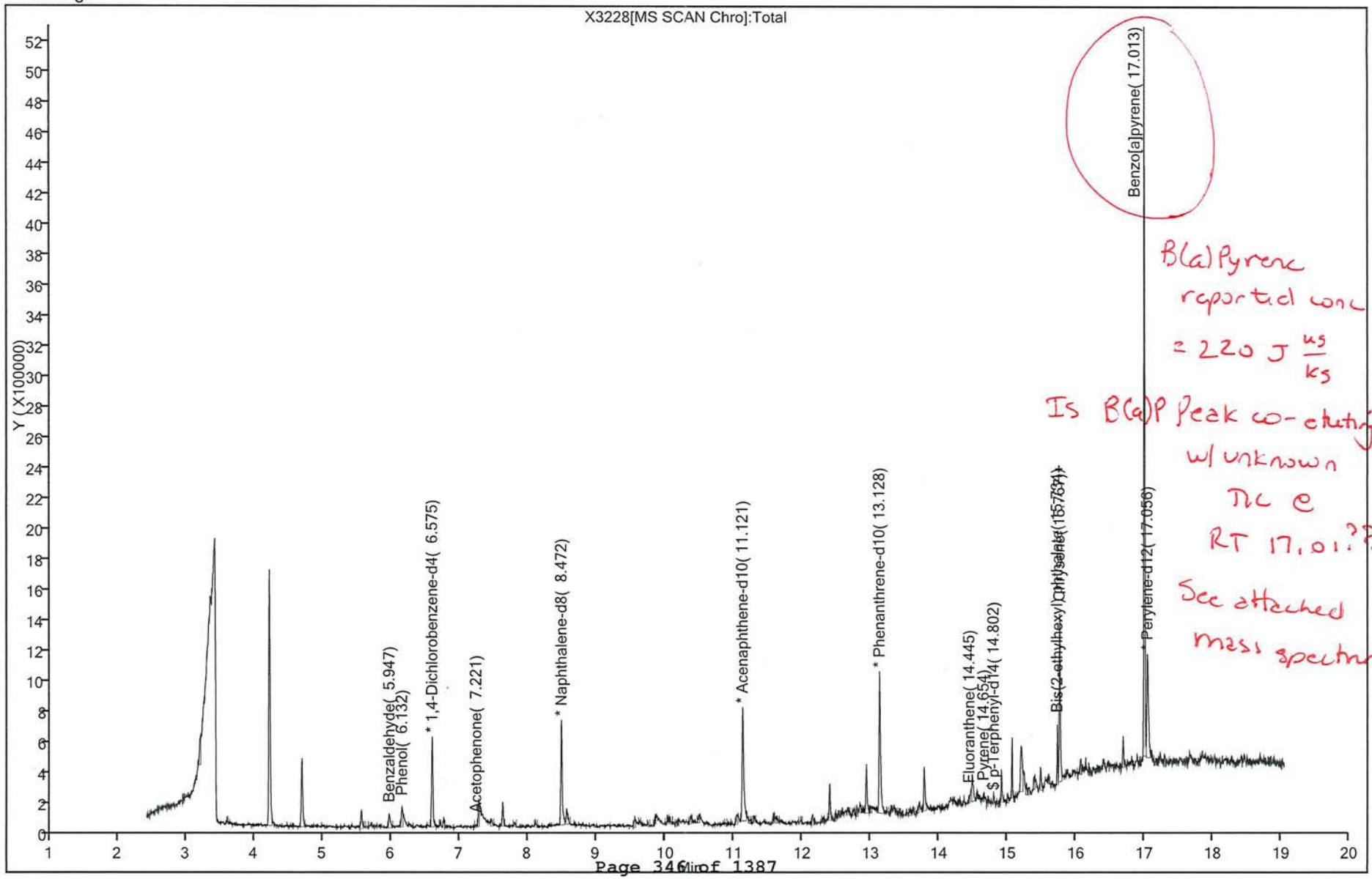


Report Date: 21-Dec-2012 13:11:14 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo

Data File:	\\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3228.D		
Injection Date:	21-Dec-2012 12:45:30	Limit Group:	MB - 8270RCP_MCP ICAL
Client ID:	OC-SD-SD-504-XXX	Instrument ID:	HP5973X
Lims Batch ID:	97046	Lims Sample ID:	8
Operator ID:	ANM	Injection Vol:	1.0 ul
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm

Y Scaling:



B(a)Pyrene reported conc = 220 J ug/kg

Is B(a)P peak co-eluting w/ unknown TIC @ RT 17.01??

See attached mass spectrum

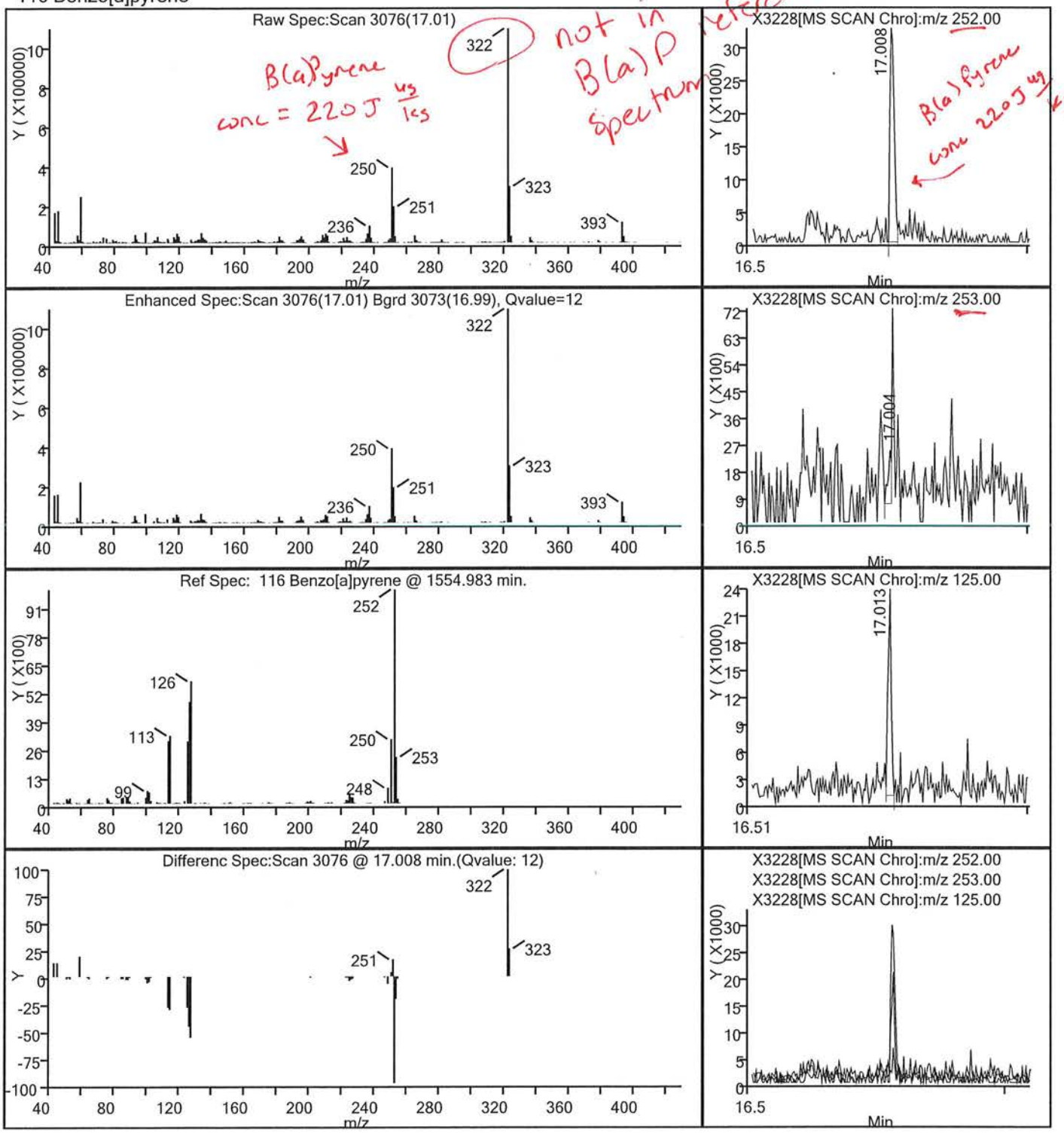
SVOC -02

Report Date: 21-Dec-2012 13:11:15 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo

Data File:	\\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3228.D		
Injection Date:	21-Dec-2012 12:45:30	Limit Group:	MB - 8270RCP_MCP ICAL
Client ID:	OC-SD-SD-504-XXX	Instrument ID:	HP5973X
Lims Batch ID:	97046	Lims Sample ID:	8
Operator ID:	ANM	Injection Vol:	1.0 ul
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm

116 Benzo[a]pyrene



Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-503-XXX**

Lab Sample ID: 480-30406-1
Client Matrix: Solid
% Moisture: 36.1

Date Sampled: 12/17/2012 1430
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3227.D
Dilution:	10			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/21/2012 1220			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		ND		160	520
1,2-Dichlorobenzene		ND		160	520
1,3-Dichlorobenzene		ND		160	520
Benzaldehyde		1300		160	520
1,4-Dichlorobenzene		ND		160	520
2,2'-oxybis[1-chloropropane]		ND		160	520
2,4,5-Trichlorophenol		ND		170	520
2,4,6-Trichlorophenol		ND		220	520
Benzyl alcohol		ND		160	1000
2,4-Dichlorophenol		ND		160	520
2,4-Dimethylphenol		ND		160	520
2,4-Dinitrophenol		ND J	*	420	520
2,4-Dinitrotoluene		ND		160	520
4-Nitroaniline		ND		440	2600
2,6-Dinitrotoluene		ND		440	520
2-Chloronaphthalene		ND		160	520
2-Chlorophenol		ND		160	520
N-Nitrosodiphenylamine		330	J	160	520
2-Methylnaphthalene		ND		160	520
2-Methylphenol		ND		160	520
2-Nitrophenol		ND		200	520
3 & 4 Methylphenol		4000		160	520
3,3'-Dichlorobenzidine		ND		190	1000
2-Nitroaniline		ND		650	2600
Hexachlorocyclopentadiene		ND		160	1000
4-Chloroaniline		ND		470	1000
4-Nitrophenol		ND J	*	220	2600
Acenaphthene		ND		160	520
4,6-Dinitro-2-methylphenol		ND		500	2600
1,2,4,5-Tetrachlorobenzene		ND		160	520
Acenaphthylene		ND		160	520
Acetophenone		160	J	160	520
Aniline		ND		160	520
Anthracene		ND		160	520
Atrazine		ND		160	520
Azobenzene		ND	*	160	520
Benzo[a]anthracene		ND		160	520
Benzo[a]pyrene		ND		160	520
Benzo[b]fluoranthene		ND		160	520
Benzo[g,h,i]perylene		ND		160	520
Caprolactam		ND		160	520
3-Nitroaniline		ND		160	2600
Benzo[k]fluoranthene		ND		270	520
Bis(2-chloroethoxy)methane		ND		160	520
1,1'-Biphenyl		ND		160	520
Bis(2-chloroethyl)ether		ND		160	520

JS 3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-503-XXX**

Lab Sample ID: 480-30406-1

Client Matrix: Solid

% Moisture: 36.1

Date Sampled: 12/17/2012 1430

Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3227.D
Dilution:	10			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/21/2012 1220			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		3100		1000	2600
Butyl benzyl phthalate		ND		160	520
Chrysene		ND		160	520
N-Nitrosodi-n-propylamine		ND		160	520
Benzoic acid		ND		230	2600
Dibenz(a,h)anthracene		ND		160	520
Dibenzofuran		ND		160	520
Diethyl phthalate		ND		170	520
Dimethyl phthalate		ND		160	520
Di-n-butyl phthalate		ND		780	2600
Di-n-octyl phthalate		ND		160	520
Phenyl ether		ND		160	520
2,3,4,6-Tetrachlorophenol		ND		160	520
Fluoranthene		ND		160	520
4-Chloro-3-methylphenol		ND		160	1000
Fluorene		ND		160	520
4-Chlorophenyl phenyl ether		ND		160	520
Hexachlorobenzene		ND		160	520
Hexachlorobutadiene		ND		160	520
Hexachloroethane		ND		160	520
Indeno[1,2,3-cd]pyrene		ND		160	520
Isophorone		ND		160	520
Naphthalene		ND		160	520
Nitrobenzene		ND		160	520
Pentachlorophenol		ND		160	520
Phenanthrene		ND		160	520
Benzophenone		ND		160	520
Phenol		1900		160	520
Pyrene		ND		160	520
N-Nitrosodimethylamine		~~ND~~ Refuse		160	520
Carbazole		ND		160	520
1-Methylnaphthalene		ND		160	520
4-Methylphenol		~~4000~~ Refuse		160	520
4-Bromophenyl phenyl ether		520 u			

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	0	X	30 - 130
2-Fluorophenol	0	X	30 - 130
Nitrobenzene-d5	0	X	30 - 130
Phenol-d5	0	X	30 - 130
2-Fluorobiphenyl	0	X	30 - 130
p-Terphenyl-d14	0	X	30 - 130

JM 3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-503-XXX**

Lab Sample ID: 480-30406-1
Client Matrix: Solid
% Moisture: 36.1

Date Sampled: 12/17/2012 1430
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3227.D
Dilution:	10			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/21/2012 1220			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	4.18	6200	T J
108-38-3	Benzene, 1,3-dimethyl-	4.66	1500	T J N
	Unknown	12.93	1300	T J
	Unknown	13.78	1100	T J
483-65-8	Phenanthrene, 1-methyl-7-(1-methylethyl)	14.91	1900	T J N
	Unknown	15.07	3100	T J
	Unknown	15.19	1700	T J
18956-15-5	2-Propen-1-one, 1-(2,6-dihydroxy-4-metho	15.48	1100	T J N
	Unknown	16.07	760	T J
26603-23-6	p,p'-Dioctyldiphenylamine	17.01	31000	T J N

JS 3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-504-XXX**

Lab Sample ID: 480-30406-2

Client Matrix: Solid

% Moisture: 43.7

Date Sampled: 12/17/2012 1500

Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3228.D
Dilution:	10			Initial Weight/Volume:	000030.8 g
Analysis Date:	12/21/2012 1245			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		ND		170	580
1,2-Dichlorobenzene		ND		170	580
1,3-Dichlorobenzene		ND		170	580
Benzaldehyde		620		170	580
1,4-Dichlorobenzene		ND		170	580
2,2'-oxybis[1-chloropropane]		ND		170	580
2,4,5-Trichlorophenol		ND		190	580
2,4,6-Trichlorophenol		ND		240	580
Benzyl alcohol		ND		170	1200
2,4-Dichlorophenol		ND		170	580
2,4-Dimethylphenol		ND		170	580
2,4-Dinitrophenol		ND J	*	470	580
2,4-Dinitrotoluene		ND		170	580
4-Nitroaniline		ND		480	2900
2,6-Dinitrotoluene		ND		480	580
2-Chloronaphthalene		ND		170	580
2-Chlorophenol		ND		170	580
N-Nitrosodiphenylamine		ND		170	580
2-Methylnaphthalene		ND		170	580
2-Methylphenol		ND		170	580
2-Nitrophenol		ND		230	580
3 & 4 Methylphenol		1800		170	580
3,3'-Dichlorobenzidine		ND		210	1200
2-Nitroaniline		ND		730	2900
Hexachlorocyclopentadiene		ND		170	1200
4-Chloroaniline		ND		520	1200
4-Nitrophenol		ND J	*	240	2900
Acenaphthene		ND		170	580
4,6-Dinitro-2-methylphenol		ND		550	2900
1,2,4,5-Tetrachlorobenzene		ND		170	580
Acenaphthylene		ND		170	580
Acetophenone		ND		170	580
Aniline		ND		170	580
Anthracene		ND		170	580
Atrazine		ND		170	580
Azobenzene		ND	*	170	580
Benzo[a]anthracene		ND		170	580
Benzo[a]pyrene		220	J	170	580
Benzo[b]fluoranthene		ND		170	580
Benzo[g,h,i]perylene		ND		170	580
Caprolactam		ND		170	580
3-Nitroaniline		ND		170	2900
Benzo[k]fluoranthene		ND		290	580
Bis(2-chloroethoxy)methane		ND		170	580
1,1'-Biphenyl		ND		170	580
Bis(2-chloroethyl)ether		ND		170	580

JS 3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-504-XXX**

Lab Sample ID: 480-30406-2
Client Matrix: Solid
% Moisture: 43.7

Date Sampled: 12/17/2012 1500
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3228.D
Dilution:	10			Initial Weight/Volume:	000030.8 g
Analysis Date:	12/21/2012 1245			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		1200	2900
Butyl benzyl phthalate		ND		170	580
Chrysene		ND		170	580
N-Nitrosodi-n-propylamine		ND		170	580
Benzoic acid		ND		260	2900
Dibenz(a,h)anthracene		ND		170	580
Dibenzofuran		ND		170	580
Diethyl phthalate		ND		190	580
Dimethyl phthalate		ND		170	580
Di-n-butyl phthalate		ND		870	2900
Di-n-octyl phthalate		ND		170	580
Phenyl ether		ND		170	580
2,3,4,6-Tetrachlorophenol		ND		170	580
Fluoranthene		ND		170	580
4-Chloro-3-methylphenol		ND		170	1200
Fluorene		ND		170	580
4-Chlorophenyl phenyl ether		ND		170	580
Hexachlorobenzene		ND		170	580
Hexachlorobutadiene		ND		170	580
Hexachloroethane		ND		170	580
Indeno[1,2,3-cd]pyrene		ND		170	580
Isophorone		ND		170	580
Naphthalene		ND		170	580
Nitrobenzene		ND		170	580
Pentachlorophenol		ND		170	580
Phenanthrene		ND		170	580
Benzophenone		ND		170	580
Phenol		1400		170	580
Pyrene		ND		170	580
N-Nitrosodimethylamine		~~ND~~ Refuse		170	580
Carbazole		ND		170	580
1-Methylnaphthalene		ND		170	580
4-Methylphenol		~~1800~~ Refuse		170	580
4-Bromophenylphenyl ether		580 u			

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	0	X	30 - 130
2-Fluorophenol	0	X	30 - 130
Nitrobenzene-d5	0	X	30 - 130
Phenol-d5	0	X	30 - 130
2-Fluorobiphenyl	0	X	30 - 130
p-Terphenyl-d14	59		30 - 130

JM 3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-504-XXX**

Lab Sample ID: 480-30406-2
Client Matrix: Solid
% Moisture: 43.7

Date Sampled: 12/17/2012 1500
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3228.D
Dilution:	10			Initial Weight/Volume:	000030.8 g
Analysis Date:	12/21/2012 1245			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.18	940	T J
	~~Unknown~~	~~4.19~~	~~8400~~	~~T J~~
	Unknown	4.66	2400	T J
	Unknown	5.54	650	T J
289-16-7	1,2,4-Trithiolane	7.61	550	T J N
	Unknown	12.40	610	T J
	Unknown	12.94	870	T J
	Unknown	13.78	830	T J
	Unknown	15.07	700	T J
	Unknown	15.21	1300	T J

3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-501-XXX**

Lab Sample ID: 480-30406-3

Client Matrix: Solid

% Moisture: 28.5

Date Sampled: 12/17/2012 1215

Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3229.D
Dilution:	10			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/21/2012 1311			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		ND		140	460
1,2-Dichlorobenzene		ND		140	460
1,3-Dichlorobenzene		ND		140	460
Benzaldehyde		1400		140	460
1,4-Dichlorobenzene		ND		140	460
2,2'-oxybis[1-chloropropane]		ND		140	460
2,4,5-Trichlorophenol		ND		150	460
2,4,6-Trichlorophenol		ND		190	460
Benzyl alcohol		ND		140	910
2,4-Dichlorophenol		ND		140	460
2,4-Dimethylphenol		ND		140	460
2,4-Dinitrophenol		ND J	*	370	460
2,4-Dinitrotoluene		ND		140	460
4-Nitroaniline		ND		380	2300
2,6-Dinitrotoluene		ND		380	460
2-Chloronaphthalene		ND		140	460
2-Chlorophenol		ND		140	460
N-Nitrosodiphenylamine		ND		140	460
2-Methylnaphthalene		ND		140	460
2-Methylphenol		ND		140	460
2-Nitrophenol		ND		180	460
3 & 4 Methylphenol		4300		140	460
3,3'-Dichlorobenzidine		ND		160	910
2-Nitroaniline		ND		580	2300
Hexachlorocyclopentadiene		ND		140	910
4-Chloroaniline		ND		410	910
4-Nitrophenol		ND J	*	190	2300
Acenaphthene		ND		140	460
4,6-Dinitro-2-methylphenol		ND		440	2300
1,2,4,5-Tetrachlorobenzene		ND		140	460
Acenaphthylene		ND		140	460
Acetophenone		150	J	140	460
Aniline		ND		140	460
Anthracene		ND		140	460
Atrazine		ND		140	460
Azobenzene		ND	*	140	460
Benzo[a]anthracene		ND		140	460
Benzo[a]pyrene		ND		140	460
Benzo[b]fluoranthene		ND		140	460
Benzo[g,h,i]perylene		ND		140	460
Caprolactam		ND		140	460
3-Nitroaniline		ND		140	2300
Benzo[k]fluoranthene		ND		230	460
Bis(2-chloroethoxy)methane		ND		140	460
1,1'-Biphenyl		ND		140	460
Bis(2-chloroethyl)ether		ND		140	460

JT 3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-501-XXX**

Lab Sample ID: 480-30406-3
Client Matrix: Solid
% Moisture: 28.5

Date Sampled: 12/17/2012 1215
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3229.D
Dilution:	10			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/21/2012 1311			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		920	2300
Butyl benzyl phthalate		ND		140	460
Chrysene		ND		140	460
N-Nitrosodi-n-propylamine		ND		140	460
Benzoic acid		ND		210	2300
Dibenz(a,h)anthracene		ND		140	460
Dibenzofuran		ND		140	460
Diethyl phthalate		ND		150	460
Dimethyl phthalate		ND		140	460
Di-n-butyl phthalate		ND		690	2300
Di-n-octyl phthalate		ND		140	460
Phenyl ether		ND		140	460
2,3,4,6-Tetrachlorophenol		ND		140	460
Fluoranthene		210	J	140	460
4-Chloro-3-methylphenol		ND		140	910
Fluorene		ND		140	460
4-Chlorophenyl phenyl ether		ND		140	460
Hexachlorobenzene		ND		140	460
Hexachlorobutadiene		ND		140	460
Hexachloroethane		ND		140	460
Indeno[1,2,3-cd]pyrene		ND		140	460
Isophorone		ND		140	460
Naphthalene		ND		140	460
Nitrobenzene		ND		140	460
Pentachlorophenol		ND		140	460
Phenanthrene		ND		140	460
Benzophenone		ND		140	460
Phenol		1700		140	460
Pyrene		180	J	140	460
N-Nitrosodimethylamine		~~ND~~ Refuse		140	460
Carbazole		ND		140	460
1-Methylnaphthalene		ND		140	460
4-Methylphenol		~~4300~~ Refuse		140	460
4-Bromophenyl phenyl ether		460 u			

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	0	X	30 - 130
2-Fluorophenol	0	X	30 - 130
Nitrobenzene-d5	0	X	30 - 130
Phenol-d5	0	X	30 - 130
2-Fluorobiphenyl	0	X	30 - 130
p-Terphenyl-d14	50		30 - 130

JR 3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-501-XXX**

Lab Sample ID: 480-30406-3

Client Matrix: Solid

% Moisture: 28.5

Date Sampled: 12/17/2012 1215

Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3229.D
Dilution:	10			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/21/2012 1311			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~4.15~~	~~6600~~	~~T J~~
95-47-6	~~Benzene, 1,2-dimethyl-~~	~~4.63~~	~~1500~~	~~T J N~~
	Unknown	8.53	620	T J
	Unknown	9.81	1400	T J
57-10-3	n-Hexadecanoic acid	13.78	1500	T J N
	Unknown	14.47	1300	T J
	Unknown	15.20	840	T J
	Unknown	15.49	990	T J
630-3-5	Nonacosane	17.31	900	T J N
	Unknown	18.61	1000	T J

JT 3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-502-XXX**

Lab Sample ID: 480-30406-4

Client Matrix: Solid

% Moisture: 30.6

Date Sampled: 12/17/2012 1245

Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3230.D
Dilution:	10			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/21/2012 1337			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		ND		140	480
1,2-Dichlorobenzene		ND		140	480
1,3-Dichlorobenzene		ND		140	480
Benzaldehyde		1900		140	480
1,4-Dichlorobenzene		ND		140	480
2,2'-oxybis[1-chloropropane]		ND		140	480
2,4,5-Trichlorophenol		ND		160	480
2,4,6-Trichlorophenol		ND		200	480
Benzyl alcohol		ND		140	950
2,4-Dichlorophenol		ND		140	480
2,4-Dimethylphenol		ND		140	480
2,4-Dinitrophenol		ND J	*	390	480
2,4-Dinitrotoluene		ND		140	480
4-Nitroaniline		ND		400	2400
2,6-Dinitrotoluene		ND		400	480
2-Chloronaphthalene		ND		140	480
2-Chlorophenol		ND		140	480
N-Nitrosodiphenylamine		ND		140	480
2-Methylnaphthalene		ND		140	480
2-Methylphenol		ND		140	480
2-Nitrophenol		ND		190	480
3 & 4 Methylphenol		6100		140	480
3,3'-Dichlorobenzidine		ND		170	950
2-Nitroaniline		ND		600	2400
Hexachlorocyclopentadiene		ND		140	950
4-Chloroaniline		ND		430	950
4-Nitrophenol		ND J	*	200	2400
Acenaphthene		ND		140	480
4,6-Dinitro-2-methylphenol		ND		460	2400
1,2,4,5-Tetrachlorobenzene		ND		140	480
Acenaphthylene		ND		140	480
Acetophenone		260	J	140	480
Aniline		ND		140	480
Anthracene		ND		140	480
Atrazine		ND		140	480
Azobenzene		ND	*	140	480
Benzo[a]anthracene		ND		140	480
Benzo[a]pyrene		ND		140	480
Benzo[b]fluoranthene		140	J	140	480
Benzo[g,h,i]perylene		ND		140	480
Caprolactam		ND		140	480
3-Nitroaniline		ND		140	2400
Benzo[k]fluoranthene		ND		240	480
Bis(2-chloroethoxy)methane		ND		140	480
1,1'-Biphenyl		ND		140	480
Bis(2-chloroethyl)ether		ND		140	480

3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-502-XXX**

Lab Sample ID: 480-30406-4

Client Matrix: Solid

% Moisture: 30.6

Date Sampled: 12/17/2012 1245

Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3230.D
Dilution:	10			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/21/2012 1337			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		960	2400
Butyl benzyl phthalate		ND		140	480
Chrysene		ND		140	480
N-Nitrosodi-n-propylamine		ND		140	480
Benzoic acid		ND		210	2400
Dibenz(a,h)anthracene		ND		140	480
Dibenzofuran		ND		140	480
Diethyl phthalate		ND		160	480
Dimethyl phthalate		ND		140	480
Di-n-butyl phthalate		ND		710	2400
Di-n-octyl phthalate		ND		140	480
Phenyl ether		ND		140	480
2,3,4,6-Tetrachlorophenol		ND		140	480
Fluoranthene		290	J	140	480
4-Chloro-3-methylphenol		ND		140	950
Fluorene		ND		140	480
4-Chlorophenyl phenyl ether		ND		140	480
Hexachlorobenzene		ND		140	480
Hexachlorobutadiene		ND		140	480
Hexachloroethane		ND		140	480
Indeno[1,2,3-cd]pyrene		ND		140	480
Isophorone		ND		140	480
Naphthalene		ND		140	480
Nitrobenzene		ND		140	480
Pentachlorophenol		ND		140	480
Phenanthrene		210	J	140	480
Benzophenone		ND		140	480
Phenol		2200		140	480
Pyrene		230	J	140	480
N-Nitrosodimethylamine		~~ND~~ Refuse		140	480
Carbazole		ND		140	480
1-Methylnaphthalene		ND		140	480
4-Methylphenol		~~6100~~ Refuse		140	470
4-Bromophenyl phenyl ether		480 u			

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	0	X	30 - 130
2-Fluorophenol	0	X	30 - 130
Nitrobenzene-d5	0	X	30 - 130
Phenol-d5	0	X	30 - 130
2-Fluorobiphenyl	0	X	30 - 130
p-Terphenyl-d14	66		30 - 130

JM 3/13/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-502-XXX**

Lab Sample ID: 480-30406-4

Client Matrix: Solid

% Moisture: 30.6

Date Sampled: 12/17/2012 1245

Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3230.D
Dilution:	10			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/21/2012 1337			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0946			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	4.09	8900	T J
106-42-3	~~p-Xylene~~	~~4.57~~	~~2200~~	~~T J N~~
1000157-89-9	(+)-.alpha.-Terpineol (p-menth-1-en-8-ol	8.53	820	T J N
	Unknown	9.80	1600	T J
	Unknown	10.17	820	T J
292-46-6	Lenthionine	12.39	1400	T J N
	Unknown	12.93	1600	T J
638-53-9	Tridecanoic acid	13.78	2000	T J N
69009-90-1	1,1'-Biphenyl, bis(1-methylethyl)-	14.46	800	T J N
18956-15-5	2-Propen-1-one, 1-(2,6-dihydroxy-4-metho	15.48	960	T J N

gr 3/13/13

VOLATILE/SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER III

SITE: Olin Chemical Project #: 6107130016 SDG #: 480-30406-1

LAB #: 480-30406-1

Sample IDs: Attach tracking sheet and/or sample listing. OC-SD-SD-501-XXX

This checklist is designed to be used with USEPA Region I Validation Guidelines Part II (12/1996). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO	NA		
Holding Times and Preservation				
☑	☐	☐	Check the raw data including instrument run and extraction logs to verify reported sample extraction and analysis dates.	
☑	☐	☐	Check the raw data including extraction and instrument run logs to verify reported sample extraction and analysis dates.	
Instrument Performance Check (Tune)				
☑	☐	☐	Compare the reported tuning results on each GC/MS Tuning and Mass Calibration Form with each raw data mass listing and mass spectrum submitted.	Since the spectra are obtained from chromatographic peaks that should be free from coelution problems, background subtraction actions resulting in spectral distortions for the sole purpose of meeting the contract or method specifications are contrary to quality assurance objectives and are, therefore, unacceptable.
☑	☐	☐	Verify that the laboratory has not made any transcription or calculation errors.	
☑	☐	☐	If possible, verify that spectra were generated using appropriate background subtraction techniques.	
Initial Calibration				
☑	☐	☐	Verify that the same instrument parameters were used for sample and calibration analyses, and that the instrument parameters which were utilized met method requirements.	
☑	☐	☐	Check and recalculate the average RRF and RRF for at least one volatile and semivolatile target compound associated with each internal standard.	Verify that the recalculated values agree within 10% of the laboratory reported values.
☑	☐	☐	Check and recalculate the %RSD for at least one volatile and semivolatile target compound associated with each internal standard.	

VOLATILE/SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER III

☐	☐	☑	Review Standard Preparation Logs (if provided in the data package) to ensure that primary and secondary initial calibration standard concentrations are accurate and traceable to NIST standards.	
☐	☐	☑	Check and recalculate the initial calibration standard concentration for one volatile and one semivolatile target compound (if standards preparation documentation was provided in the data package).	Verify that the recalculated values agree within 10% of the laboratory reported values.
Continuing Calibration				
☑	☐	☐	Verify that the same instrument parameters were used for sample and calibration analyses, and that the instrument parameters which were utilized met method requirements.	
☑	☐	☐	Check and recalculate the RRF for at least one volatile and semivolatile target compound associated with each internal standard.	
☑	☐	☐	Check and recalculate the %D for at least one volatile and semivolatile target compound associated with each internal standard.	Verify that the recalculated values agree within 10% of the laboratory reported values.
☐	☐	☑	Review Standard Preparation Logs (if provided in the data package) to ensure that primary and secondary continuing calibration standard concentrations are accurate and traceable to NIST standards.	
☐	☐	☑	Check and recalculate the continuing calibration standard concentration for one volatile and one semivolatile target compound (if standards preparation documentation was provided in the data package).	
Blanks				
☑	☐	☐	Verify from the raw data that the extraction and/or analysis dates and times, sample IDs, file IDs, etc. are accurately reported on the tabulated result forms.	
☑	☐	☐	Verify from the raw data, the Blank Summary form, and Form Is that a VOA instrument blank was analyzed in the same purging/sparging vessel (i.e, same position in the autosampler) as the sample that exceeded the instrument	

VOLATILE/SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER III

			calibration range.	
☐	☐	☑	Verify from the raw GPC data that a GPC instrument blank was analyzed after the GPC calibration and prior to sample analysis.	
☐	☐	☑	Verify from the raw Silica Gel data that a Silica Gel Column reagent blank was analyzed prior to sample analysis.	
☑	☐	☐	Check 10% of the raw data for each blank to verify that internal standard areas and retention time data, have been correctly transcribed to tabulated forms and that surrogate compound recovery data have been correctly calculated and transcribed to tabulated forms.	Review the blank chromatograms, quantitation reports, and mass spectra to ensure that no false positives or false negatives have been reported. Calc checks identified lab error using incorrect RRF for calc of all SVOC results; lab was contacted & all SVOC data were corrected and reissued 3/12/13.
☑	☐	☐	Review the raw data (chromatograms, mass spectra and quantitation reports) to confirm the presence of target and non-target compounds in the blanks and to evaluate the presence of additional contaminants.	
Surrogates				
☑	☐	☐	Check raw data (e.g., chromatograms and quantitation reports) to verify that surrogate recoveries were reported accurately on the Surrogate Recovery Forms.	
☑	☐	☐	Ten percent of the surrogate compound recovery data should be checked for calculation and/or transcription errors. If errors are detected in this ten percent, then an additional ten percent of the data should be checked. If errors are found I the additional 10%, then all surrogate compound recovery calculations and transcriptions in the data package should be checked.	See above.
Internal Standards				
☑	☐	☐	Check raw data (e.g., chromatograms and quantitation reports) to verify that the internal standard retention times and areas are accurately reported on the tabulated forms.	
Field Duplicates				
☐	☐	☑	Check and recalculate the analytical concentration for at least one positive detect and one sample quantitation limit (for a diluted sample or soil sample) for each fraction, in every field duplicate	

VOLATILE/SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER III

			sample.	
MDL Study				
☑	☐	☐	Check and recalculate the %RSD and % recoveries for at least three compounds per MDL study.	Verify that the recalculated values agree within 10% of the laboratory reported values.
☐ Not provided	☐	☑	Check the standards preparation logs to verify that the stock standard used to prepare the LFB was from a source independent from the initial and continuing calibration standards.	
☐	☐	☑	Check and recalculate % recovery for at least one compound per LFB fraction.	Verify that the recalculated values agree within 10% of the laboratory reported values.
PE Samples/Accuracy Check				
☑	☐	☐	Check and recalculate the percent recovery for at least one compound per LCS fraction.	Verify that the recalculated values agree within 10% of the laboratory reported values.
☐	☐	☑	Determine what percentage of analytes were below or above PES acceptance criteria.	
☐	☐	☑	Check and recalculate the analytical concentrations for at least one compound per PES fraction.	Verify that the recalculated values agree within 10% of the laboratory reported values.
Target Compound Identification				
☑	☐	☐	Check that the RRT of a reported compound is within+/- 0.06 RRT units of the standard RRT.	
☑	☐	☐	Compare all sample compound spectra to the laboratory standard spectra and verify that the mass spectral identification criteria are met.	
☑	☐	☐	Check the sample chromatogram to verify that all major peaks of interest are identified as either target compounds, TICs, surrogate compounds, or the internal standards.	4-methylphenol missed in all sediment samples; lab was contacted and corrected & re-issued report 3/18/13
☐	☐	☑	The validator should be aware of situations when sample carryover is a possibility, and should use professional judgment to determine if instrument cross-contamination has affected any	

			compound identification.	
Compound Quantitation and Reported Quant Limits				
☑	☐	☐	Recalculate, from the raw data, the concentrations for at least one positive detect and one sample quantitation limit (for a diluted sample or a soil sample) for each fraction, in every field sample to verify that laboratory reported sample results were accurately calculated according to the method.	See calc comments in method blank section.
☑	☐	☐	Verify that the concentrations for positive detects and sample quantitation limits have been adjusted to reflect sample dilutions, concentrations, cleanup methods and dry weight factors that are not accounted for in the method.	
☑	☐	☐	Verify that the correct internal standard, quantitation ion and standard RRF were used to quantitate sample results for at least one positive detect in each fraction in every field sample.	
Tentatively Identified Compounds				
☑	☐	☐	Verify that the laboratory has generated a library search for all required peaks in the sample and blank chromatograms.	
☑	☐	☐	Verify that a target compound was not missed by the target compound search procedure and erroneously reported as a TIC in the proper analytical fraction.	Initially 4-methylphenol was reported as TIC and missed as target cmpd; lab was contacted and reissued corrected report 3/13/13
☑	☐	☐	Verify that all TICs are reported with estimated (J) concentrations by the laboratory. Verify that TIC concentrations were calculated correctly, assuming a RRF of 1.0 and using the closest eluting IS that is free of interferences.	NOTE: TIC peak at RT 17 minutes in OC-SD-SD-504-XXX was missed by lab; appears to be same cmpd as reported @ RT 17 for OC-SD-SD-503-XXX; noted in validation report.
☑	☐	☐	Verify that the blanks do not contain any TIC peaks.	Common lab contaminants: CO2, siloxanes, diethyl ether, hexane,certain freons, and phthalates.
☑	☐	☐	Examine all TIC mass spectra in every sample and blank.	Solvent preservatives: cyclohexene, cyclohexanone, cyclohexenone, cyclohexanol, cyclohexenol, chlorocyclohexene, and
☑	☐	☐	Verify that TICs were reported as unknowns if the TIC spectra presented do not meet criteria set forth in Section XIV B.4.	

☑	☐	☐	Review blank and sample TIC spectra to ensure that common laboratory artifacts/contaminants are not reported as TICs.	chlorocyclohexanol. Aldol condensation reaction products.
SVOC Cleanup				
Gel Permeation Chromatography (GPC)				
☐ N/A	☐	☐	Verify that the GPC system was calibrated initially in accordance with the method requirements and that peak shape and resolution criteria were met.	GPC cleanup not performed
☐	☐	☐	Confirm from the raw data that the GPC calibration check was performed at the method required frequency.	
☐	☐	☐	Verify that a GPC calibration check solution was analyzed in accordance with the method and that the correct target and surrogate compounds, interferents and concentrations were used.	
☐	☐	☐	Verify that surrogate compound recoveries and internal standard area counts and/or retention times in the GPC calibration check meet method QC acceptance.	
☐	☐	☐	Review the raw GPC calibration check data to verify that peaks are symmetrical and resolution meets method QC acceptance criteria for target and surrogate compounds and interferents in the GPC calibration check solution.	
☐	☐	☐	Check the raw GPC calibration check data to verify that retention times for any compounds or interferents in the GPC calibration solution did not vary more than +/-5% between calibrations.	
☐	☐	☐	Verify that a GPC instrument blank was analyzed after each GPC calibration and calibration check and prior to sample analysis.	
☐	☐	☐	Verify that there are no target compounds present at greater than or equal to the quantitation limit in the GPC instrument blank.	
☐	☐	☐	Verify that surrogate compound recoveries and internal standard area counts and/or retention times (if added) in the GPC instrument blank meet method QC acceptance criteria.	
☐	☐	☐	Compare the raw data to the reported results, if available, and verify that no calculation and/or transcription errors	

			have occurred. If the result forms are not available, then the validator must review the cleanup logs to confirm that method required cleanups were performed.	
Silica Gel Cleanup				
☐	☐	☑	Verify that a Silica Gel Check solution was prepared and analyzed in accordance with the method and that the correct target and surrogate compounds, interferents, and concentrations were used.	No evidence of clean up in prep log info.
☐	☐	☑	Verify that surrogate compound recoveries and internal standard area counts and/or retention times in the Silica Gel Check solution meet method QC acceptance criteria..	
☐	☐	☑	Verify that a Silica Gel column reagent blank was prepared with each cleanup batch and was analyzed after the Silica Gel Check solution but prior to field samples.	
☐	☐	☑	Verify that there are no target compounds present at greater than or equal to the quantitation limit in the Silica Gel column reagent blank.	
☐	☐	☑	Verify that surrogate compound recoveries and internal standard area counts and/or retention times (if added) in the Silica Gel column reagent blank meet method QC acceptance criteria.	
☐	☐	☑	Compare the raw data to the reported results, if available, and verify that no calculation and/or transcription errors have occurred. If the result forms are not available, then the validator must review the cleanup logs to confirm that method required cleanups were performed.	
System Performance				
☐ N/A	☐	☐	Evaluate all PES and other relevant QC data to determine if any analytical trends exist over the sample analysis period.	No PE data available
☐	☐	☐	The validator should ascertain from the PES and other relevant QC data if there is a high or low quantitative bias for a particular compound or group of compounds.	
☐	☐	☐	The validator should ascertain from the PES and other relevant QC data if there is a potential for false negative and/or false	

			positives to be reported.
☐	☐	☑	The validator should ascertain from the MS/MSD and surrogate spike compound analyses if the sample matrix effects impact compound recovery, thus indicating a method bias outside the control of the laboratory.
☑	☐	☐	Evaluate sample and QC sample reconstructed ion chromatograms analyzed on all columns to determine if the column chromatography, peak shape,, resolution, and baseline drift has either deteriorated or improved over the sample analysis period.
☑	☐	☐	The validator should ascertain from the raw data if unacceptable chromatography may contribute to a high or a low quantitative bias for a particular compound or group of compounds.
☑	☐	☐	The validator should also ascertain from the raw data if unacceptable chromatography may result in a potential for false negative and/or false positive identification.
☑	☐	☐	The validator should determine if chromatography prolems are a result of the sample matrix or are unique to the instrument.
☑	☐	☐	The validator should determine if significant retention time shifts have occurred between initial and continuing calibration.
☑	☐	☐	Compare the daily standard calibration area counts to ascertain if the instrument generated consistent detector responses over the sample analysis period.
☑	☐	☐	Review the area counts of the internal standards and surrogate compounds for each sample to ascertain if there is a change in detector response.
☐	☐	☑	The validator should evaluate the MS/MSD RPDs in conjunction with field duplicate RPDs to identify any analytical trends, ascertain if sample matrices were homogenous or heterogeneous, and determine if sampling error may have contributed to field imprecision.
☑	☐	☐	Review all daily LFBs, low level calibrated standards, and PES data to evaluate sensitivity for each instrument to verify that no instrument has lost its ability to to

VOLATILE/SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER III

			accurately quantitate and identify compounds at the quantitation limit over the sample analysis period, which could possibly result in false negatives and low biased results.	
☑	☐	☐	Check the area counts of the individual sample, QC sample, calibration and blank internal standards to monitor instrument sensitivity changes.	
☑	☐	☐	Review the sample chromatograms for abrupt, discrete shifts in the chromatographic baseline which may indicate a change in the instrument's sensitivity or the zero setting.	
☑	☐	☐	The validator may determine that instrument sensitivity is adequate but sample matrix effects may preclude obtaining the quantitation limits required by the project DQOs using the analytical method employed.	SVOC samples analyzed @ 10-fold dilution due to sample matrix; elevated (10x) RLs were reported for all SVOC sediment samples.
☑	☐	☐	Review all blank and sample results to evaluate the possibility of sample contamination introduced via either cross contamination from a previously run sample or from general lab contamination.	
☐	☐	☑	Compare blank analysis on two different instruments to determine if the contamination is instrument related or the interferents are present in the blank from sample processing activities.	
☑	☐	☐	Assess whether problematic blank results are reproducible when replicate aliquots are analyzed or are sporadic interferences.	

Validator's Signature: Julie Minaev

Date: 2/21/13 / 3/13/13 (re-issued data reviewed)

Reference:

U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

BFB Tune - VOC

Report Date: 20-Dec-2012 14:32:48 Chrom Revision: 2.0 22-Oct-2012 16:30:48

Data File: \\Bufchrom\ChromData\HP5973F\20121219-17691.b\F4451.D\F-8260 SOIL.rslt\spectra.d
Injection Date: 19-Dec-2012 11:00:30
Spectrum: Tune Spec: Scans 565-567(5.72-5.73)
Base Peak: 95.00
Minimum % Base Peak: 0
Number of Points: 24

m/z	Y	m/z	Y	m/z	Y	m/z	Y
37.00	542	62.00	491	75.00	5963	95.00	14224
38.00	308	63.00	264	76.00	447	96.00	989
49.00	480	68.00	1049	87.00	741	174.00	12774
50.00	2200	69.00	1156	88.00	539	175.00	926
51.00	707	73.00	493	93.00	473	176.00	12631
61.00	498	74.00	1858	94.00	1523	177.00	821

m/z $\frac{50}{95} = \frac{2200}{14224} = 15.47\%$ OK

m/z $\frac{75}{95} = \frac{5963}{14224} = 41.92$ OK

2/27/13

ICAL - VOC

Report Date: 26-Dec-2012 09:55:44 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973F\20121217-17620.b\F4394.D		
Lims ID:	STD5	Client ID:	
Inject. Date:	17-Dec-2012 13:56:30	Dil. Factor:	1.0000
Sample Type:	ICIS	Calib Level:	5
Sample ID:	STD5		
Misc. Info.:	480-0017620-007 =480-0017620-007		
Operator:	jmb	Instrument ID:	HP5973F
Purge Vol:	5.000 mL	ALS Bottle#:	7
Lims Batch ID:	96157	Lims Sample ID:	7
Sublist:	chrom-F-8260 SOIL*sub1		
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973F\20121217-17620.b\F-8260 SOIL.m		
Last Update:	26-Dec-2012 09:55:44	Calib Date:	17-Dec-2012 14:47:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973F\20121217-17620.b\F4396.D		
Limit Group:	MV - 8260MCP_RCP		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	ZB-624	Column Dia:	0.25 mm
Process Host:	XAWRK019		

First Level Reviewer: ByrnesJ Date: 17-Dec-2012 16:04:20

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
* 1 1,4-Difluorobenzene	114	5.608	5.608	0.0	92	375611	50.0	
* 2 Chlorobenzene-d5	82	8.382	8.382	0.0	73	160442	50.0	
* 3 1,4-Dichlorobenzene-d4	152	10.700	10.700	0.0	84	179570	50.0	
$ 4 1,2-Dichloroethane-d4 (Surr)	67	5.304	5.304	0.0	95	58798	47.5	
$ 5 Toluene-d8 (Surr)	98	6.934	6.934	0.0	90	452163	48.7	
$ 6 4-Bromofluorobenzene (Surr)	174	9.599	9.599	0.0	92	149988	47.0	
10 Dichlorodifluoromethane	85	2.001	2.001	0.0	85	87277	48.5	
12 Chloromethane	50	2.153	2.153	0.0	89	99266	52.7	
13 Vinyl chloride	62	2.274	2.274	0.0	82	96111	50.5	
14 Bromomethane	94	2.554	2.554	0.0	86	32596	43.9	
15 Chloroethane	64	2.633	2.633	0.0	93	33597	51.1	
17 Trichlorofluoromethane	101	2.852	2.852	0.0	82	116860	47.0	
20 Acrolein	56	3.193	3.193	0.0	95	409078	1030.8	
21 1,1,2-Trichloro-1,2,2-trifluoroe	101	3.230	3.230	0.0	80	101280	46.1	
22 1,1-Dichloroethene	96	3.260	3.260	0.0	84	112617	53.1	
23 Acetone	43	3.309	3.309	0.0	98	233140	256.8	
25 Iodomethane	142	3.424	3.424	0.0	96	178314	52.0	
26 Carbon disulfide	76	3.479	3.479	0.0	98	333571	48.4	
27 Methyl acetate	43	3.528	3.528	0.0	91	151753	50.4	
29 Acetonitrile	40	3.564	3.564	0.0	99	433814	2044.0	
30 Methylene Chloride	84	3.649	3.649	0.0	85	131055	50.3	
32 Methyl tert-butyl ether	73	3.807	3.807	0.0	87	337049	51.6	
34 trans-1,2-Dichloroethene	96	3.838	3.838	0.0	96	133876	52.7	
33 Acrylonitrile	53	3.856	3.856	0.0	100	296321	259.4	
37 Vinyl acetate	43	4.160	4.160	0.0	97	1225317	262.9	
39 1,1-Dichloroethane	63	4.179	4.179	0.0	84	208577	51.7	
43 2-Butanone (MEK)	43	4.623	4.623	0.0	100	381605	260.6	
44 2,2-Dichloropropane	77	4.629	4.629	0.0	63	157937	50.3	
45 cis-1,2-Dichloroethene	96	4.635	4.635	0.0	68	145058	52.1	

JM 2/27/13

RRF Acetone = $\frac{233140}{375611} \times \frac{50}{250} = 0.1241$ OK

$\overline{RRF} = (.1295 + .1145 + .1213 + .1215 + .1241 + .1288 + .1062)/7 = 0.1208$

%RSD = $\frac{.008207}{.1208} = 6.79$ OK

IRAL - VOC

Report Date: 26-Dec-2012 09:55:44 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973F\20121217-17620.b\F4394.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
48 Chlorobromomethane	128	4.842	4.842	0.0	88	76320	53.3	
49 Tetrahydrofuran	42	4.860	4.860	0.0	89	251879	261.6	
50 Chloroform	83	4.878	4.878	0.0	81	204952	52.2	
51 1,1,1-Trichloroethane	97	5.024	5.024	0.0	92	173677	49.6	
52 Cyclohexane	56	5.055	5.055	0.0	88	204441	47.7	
54 1,1-Dichloropropene	75	5.140	5.140	0.0	92	161084	52.7	
55 Carbon tetrachloride	117	5.152	5.152	0.0	78	140809	46.8	
57 Benzene	78	5.334	5.334	0.0	97	495767	51.7	
58 1,2-Dichloroethane	62	5.371	5.371	0.0	77	152590	51.1	
62 Trichloroethene	95	5.858	5.858	0.0	90	133024	52.7	
64 Methylcyclohexane	83	5.991	5.991	0.0	88	210064	46.5	
65 1,2-Dichloropropane	63	6.077	6.077	0.0	94	121957	52.5	
67 Dibromomethane	93	6.210	6.210	0.0	88	72928	53.6	
68 Dichlorobromomethane	83	6.320	6.320	0.0	92	136701	48.4	
69 2-Chloroethyl vinyl ether	63	6.527	6.527	0.0	93	426856	265.7	
72 cis-1,3-Dichloropropene	75	6.703	6.703	0.0	86	179177	49.1	
73 4-Methyl-2-pentanone (MIBK)	43	6.801	6.801	0.0	95	734574	261.6	
74 Toluene	92	6.995	6.995	0.0	98	330879	51.2	
75 Ethyl methacrylate	69	7.214	7.214	0.0	90	165518	54.4	
77 trans-1,3-Dichloropropene	75	7.220	7.220	0.0	90	160022	49.8	
79 1,1,2-Trichloroethane	83	7.421	7.421	0.0	83	89843	52.5	
81 Tetrachloroethene	166	7.525	7.525	0.0	91	158669	52.2	
82 1,3-Dichloropropane	76	7.585	7.585	0.0	90	182455	51.4	
80 2-Hexanone	43	7.591	7.591	0.0	94	532588	264.4	
83 Chlorodibromomethane	129	7.829	7.829	0.0	87	110180	45.7	
84 Ethylene Dibromide	107	7.963	7.963	0.0	97	125999	53.1	
87 Chlorobenzene	112	8.413	8.413	0.0	95	399228	51.1	
88 Ethylbenzene	91	8.474	8.474	0.0	97	611561	52.2	
89 1,1,1,2-Tetrachloroethane	131	8.492	8.492	0.0	87	126642	49.2	
90 m-Xylene & p-Xylene	106	8.589	8.589	0.0	100	517496	104.3	
91 o-Xylene	106	9.027	9.027	0.0	93	251121	52.0	
92 Styrene	104	9.045	9.045	0.0	95	420599	53.5	
95 Bromoform	173	9.325	9.325	0.0	95	68628	43.8	
94 Isopropylbenzene	105	9.386	9.386	0.0	94	641525	51.9	
97 1,1,2,2-Tetrachloroethane	83	9.757	9.757	0.0	87	161801	53.7	
101 Bromobenzene	156	9.769	9.769	0.0	86	182207	51.3	
98 trans-1,4-Dichloro-2-butene	53	9.800	9.800	0.0	54	204459	269.3	
99 N-Propylbenzene	91	9.800	9.800	0.0	95	733386	52.3	
100 1,2,3-Trichloropropane	110	9.812	9.812	0.0	79	53233	51.9	
103 2-Chlorotoluene	126	9.934	9.934	0.0	98	173167	51.6	
102 1,3,5-Trimethylbenzene	105	9.964	9.964	0.0	94	541912	52.0	
105 4-Chlorotoluene	126	10.037	10.037	0.0	95	179667	52.0	
106 tert-Butylbenzene	134	10.280	10.280	0.0	88	134940	52.1	
107 1,2,4-Trimethylbenzene	105	10.329	10.329	0.0	95	537496	51.9	
109 sec-Butylbenzene	105	10.481	10.481	0.0	92	698408	52.4	
110 4-Isopropyltoluene	119	10.603	10.603	0.0	94	633782	52.4	
111 1,3-Dichlorobenzene	146	10.645	10.645	0.0	95	342595	50.7	
113 1,4-Dichlorobenzene	146	10.725	10.725	0.0	96	344052	49.7	
115 n-Butylbenzene	91	10.974	10.974	0.0	93	505507	52.9	
116 1,2-Dichlorobenzene	146	11.065	11.065	0.0	98	325565	50.6	
117 1,2-Dibromo-3-Chloropropane	75	11.740	11.740	0.0	80	24824	48.8	
119 1,2,4-Trichlorobenzene	180	12.391	12.391	0.0	94	209211	52.8	

CC 2/27/13

RRF Chlorobenzene $= \frac{399228}{160442} \times \frac{50}{50} = 2.4883$ OK

%RSD $= \frac{.1443}{2.4336} = 5.9$ OK

$\overline{RRF} = (2.3366 + 2.2164 + 2.5397 + 2.6547 + 2.4883 + 2.4379 + 2.3619)/7 = 2.4336$ OK

IRAL - VOC

Report Date: 26-Dec-2012 09:55:44 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973F\20121217-17620.b\F4394.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
120 Hexachlorobutadiene	225	12.483	12.483	0.0	94	110386	52.9	
121 Naphthalene	128	12.623	12.623	0.0	96	556405	52.7	
122 1,2,3-Trichlorobenzene	180	12.842	12.842	0.0	95	190996	54.5	
S 123 Total BTEX	1				0		311.4	
S 124 Xylenes, Total	1				0		156.3	
S 125 1,2-Dichloroethene, Total	1				0		104.9	
S 126 1,3-Dichloropropene, Total	1				0		98.9	

$$RRF_{Toluene} = \frac{330879}{160442} \times \frac{50}{50} = 2.0623 \text{ OK}$$

$$RRF_{1,2,4\text{-TMB}} = \frac{537496}{179570} \times \frac{50}{50} = 2.9932 \text{ OK}$$

$$\overline{RRF}_{1,2,4\text{-TMB}} = (2.6229 + 2.5112 + 3.0513 + 3.1721 + 2.9932 + 2.9483 + 2.8761)/7 = 2.8822 \text{ OK}$$

$$\%RSD = \frac{.2360}{2.8822} = 8.19\% \text{ OK}$$

2/22/13

CCAL - VOC

Report Date: 19-Dec-2012 12:14:21 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973F\20121219-17691.b\F4453.D		
Lims ID:	CCVIS	Client ID:	
Inject. Date:	19-Dec-2012 11:53:30	Dil. Factor:	1.0000
Sample Type:	CCVIS		
Sample ID:	CCVIS		
Misc. Info.:	480-0017691-003 =480-0017691-003		
Operator:	JMB	Instrument ID:	HP5973F
Purge Vol:	5.000 mL	ALS Bottle#:	3
Lims Batch ID:	96559	Lims Sample ID:	3
Sublist:	chrom-F-8260 SOIL*sub1		
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973F\20121219-17691.b\F-8260 SOIL.m		
Last Update:	19-Dec-2012 12:14:21	Calib Date:	17-Dec-2012 14:47:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973F\20121217-17620.b\F4396.D		
Limit Group:	MV - 8260MCP_RCP		
Integrator:	RTE	ID Type:	RT Order ID
Column Type:	ZB-624	Column Dia:	0.25 mm
Process Host:	XAWRK020		

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
* 1 1,4-Difluorobenzene	114	5.608	5.608	0.0	92	280215	50.0	
* 2 Chlorobenzene-d5	82	8.382	8.382	0.0	72	121672	50.0	
* 3 1,4-Dichlorobenzene-d4	152	10.700	10.700	0.0	74	132638	50.0	
$ 4 1,2-Dichloroethane-d4 (Surr)	67	5.304	5.304	0.0	95	38436	41.6	
$ 5 Toluene-d8 (Surr)	98	6.934	6.934	0.0	91	308220	43.8	
$ 6 4-Bromofluorobenzene (Surr)	174	9.599	9.599	0.0	90	102574	42.3	
10 Dichlorodifluoromethane	85	2.001	2.001	0.0	78	60796	45.4	
12 Chloromethane	50	2.159	2.159	0.0	89	63728	45.4	
13 Vinyl chloride	62	2.274	2.274	0.0	81	67673	47.7	
14 Bromomethane	94	2.560	2.560	0.0	78	25181	45.3	
15 Chloroethane	64	2.633	2.633	0.0	87	25439	51.9	
17 Trichlorofluoromethane	101	2.858	2.858	0.0	82	89051	48.0	
20 Acrolein	56	3.193	3.193	0.0	91	275002	928.8	
21 1,1,2-Trichloro-1,2,2-trifluoroe	101	3.230	3.230	0.0	79	76029	46.3	
22 1,1-Dichloroethene	96	3.260	3.260	0.0	84	79066	50.0	
23 Acetone	43	3.309	3.309	0.0	97	144392	213.2	
25 Iodomethane	142	3.424	3.424	0.0	96	121193	47.3	
26 Carbon disulfide	76	3.473	3.473	0.0	98	241093	46.9	
27 Methyl acetate	43	3.528	3.528	0.0	90	100074	44.5	
29 Acetonitrile	40	3.564	3.564	0.0	100	273778	1729.1	
30 Methylene Chloride	84	3.649	3.649	0.0	83	90329	46.4	
32 Methyl tert-butyl ether	73	3.801	3.801	0.0	88	243562	50.0	
34 trans-1,2-Dichloroethene	96	3.838	3.838	0.0	95	92732	49.0	
33 Acrylonitrile	53	3.856	3.856	0.0	100	195586	229.5	
37 Vinyl acetate	43	4.160	4.160	0.0	97	838401	241.1	
39 1,1-Dichloroethane	63	4.179	4.179	0.0	81	145039	48.2	
43 2-Butanone (MEK)	43	4.623	4.623	0.0	100	242801	222.3	
44 2,2-Dichloropropane	77	4.629	4.629	0.0	71	119932	51.2	
45 cis-1,2-Dichloroethene	96	4.635	4.635	0.0	68	100370	48.4	
48 Chlorobromomethane	128	4.842	4.842	0.0	87	50809	47.5	
49 Tetrahydrofuran	42	4.860	4.860	0.0	88	163446	227.5	

JR 2/27/13

$RRF_{Acetone} = \frac{144392}{280215} \times \frac{50}{250} = 0.10306$ OK

$SD = \frac{.10306 - .1208}{.1208} = -14.7$ OK

CCAL - VOC

Report Date: 19-Dec-2012 12:14:21 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973F\20121219-17691.b\F4453.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
50 Chloroform	83	4.878	4.878	0.0	80	140829	48.1	
51 1,1,1-Trichloroethane	97	5.024	5.024	0.0	91	127643	48.9	
52 Cyclohexane	56	5.055	5.055	0.0	87	149180	46.7	
54 1,1-Dichloropropene	75	5.146	5.146	0.0	92	115500	50.6	
55 Carbon tetrachloride	117	5.152	5.152	0.0	79	112670	50.1	
57 Benzene	78	5.335	5.335	0.0	96	342278	47.8	
58 1,2-Dichloroethane	62	5.365	5.365	0.0	77	103046	46.3	
62 Trichloroethene	95	5.858	5.858	0.0	90	92845	49.3	
64 Methylcyclohexane	83	5.992	5.992	0.0	87	159620	47.3	
65 1,2-Dichloropropane	63	6.077	6.077	0.0	94	83376	48.2	
67 Dibromomethane	93	6.211	6.211	0.0	84	49761	49.0	
68 Dichlorobromomethane	83	6.320	6.320	0.0	91	100606	47.8	
69 2-Chloroethyl vinyl ether	63	6.527	6.527	0.0	91	298238	248.8	
72 cis-1,3-Dichloropropene	75	6.703	6.703	0.0	82	134663	49.5	
73 4-Methyl-2-pentanone (MIBK)	43	6.801	6.801	0.0	95	480919	225.9	
74 Toluene	92	6.995	6.995	0.0	92	233724	47.7	
75 Ethyl methacrylate	69	7.214	7.214	0.0	87	119096	51.6	
77 trans-1,3-Dichloropropene	75	7.220	7.220	0.0	91	120236	49.3	
79 1,1,2-Trichloroethane	83	7.415	7.415	0.0	83	62900	48.5	
81 Tetrachloroethene	166	7.525	7.525	0.0	90	108316	47.0	
82 1,3-Dichloropropane	76	7.585	7.585	0.0	92	126033	46.8	
80 2-Hexanone	43	7.592	7.592	0.0	94	353751	231.6	
83 Chlorodibromomethane	129	7.829	7.829	0.0	86	85687	46.8	
84 Ethylene Dibromide	107	7.963	7.963	0.0	94	87140	48.4	
87 Chlorobenzene	112	8.413	8.413	0.0	95	277598	46.9	
88 Ethylbenzene	91	8.474	8.474	0.0	97	437542	49.3	
89 1,1,1,2-Tetrachloroethane	131	8.492	8.492	0.0	84	94394	48.4	
90 m-Xylene & p-Xylene	106	8.589	8.589	0.0	100	370998	98.6	
91 o-Xylene	106	9.021	9.021	0.0	95	179083	48.9	
92 Styrene	104	9.045	9.045	0.0	95	298671	50.1	
95 Bromoform	173	9.319	9.319	0.0	95	56192	47.1	
94 Isopropylbenzene	105	9.386	9.386	0.0	94	461166	50.5	
97 1,1,2,2-Tetrachloroethane	83	9.757	9.757	0.0	81	111333	50.0	
101 Bromobenzene	156	9.769	9.769	0.0	86	124765	47.6	
98 trans-1,4-Dichloro-2-butene	53	9.800	9.800	0.0	56	148412	264.7	
100 1,2,3-Trichloropropane	110	9.812	9.812	0.0	57	35217	46.5	
103 2-Chlorotoluene	126	9.928	9.928	0.0	98	122410	49.4	
102 1,3,5-Trimethylbenzene	105	9.964	9.964	0.0	81	391052	50.8	
99 N-Propylbenzene	91	10.031	10.031	0.0	52	318169	49.7	
105 4-Chlorotoluene	126	10.031	10.031	0.0	96	124589	48.8	
106 tert-Butylbenzene	134	10.280	10.280	0.0	87	94304	49.3	
107 1,2,4-Trimethylbenzene	105	10.329	10.329	0.0	95	395489	51.7	
109 sec-Butylbenzene	105	10.481	10.481	0.0	92	509393	51.7	
110 4-Isopropyltoluene	119	10.603	10.603	0.0	94	468094	52.4	
111 1,3-Dichlorobenzene	146	10.645	10.645	0.0	90	241522	48.4	
113 1,4-Dichlorobenzene	146	10.725	10.725	0.0	96	244715	47.9	
115 n-Butylbenzene	91	10.974	10.974	0.0	93	375718	53.2	
116 1,2-Dichlorobenzene	146	11.065	11.065	0.0	98	228483	48.0	
117 1,2-Dibromo-3-Chloropropane	75	11.741	11.741	0.0	77	19291	51.2	
119 1,2,4-Trichlorobenzene	180	12.385	12.385	0.0	95	155556	53.1	
120 Hexachlorobutadiene	225	12.483	12.483	0.0	93	84358	54.7	
121 Naphthalene	128	12.623	12.623	0.0	96	420330	53.9	

gr 2/27/13

RRF Toluene $= \frac{233724}{121672} \times \frac{50}{50} = 1.9209$ OK

S.D. $= \frac{1.9209 - 2.013}{2.013} = -4.57$ OK

CCAL - VOC

Report Date: 19-Dec-2012 12:14:21 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973F\20121219-17691.b\F4453.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
122 1,2,3-Trichlorobenzene	180	12.842	12.842	0.0	95	140066	54.1	
S 125 1,2-Dichloroethene, Total	1				0		97.3	
S 126 1,3-Dichloropropene, Total	1				0		98.8	
S 123 Total BTEX	1				0		292.3	
S 124 Xylenes, Total	1				0		147.5	

$$RRF_{1,2,4\text{-}TMB} = \frac{395489}{132638} \times \frac{50}{50} = 2.9817$$

$$\%D = \frac{2.9817 - 2.882}{2.882} = 3.46$$

g~
2/27/13

Method Blank - VOC

Report Date: 19-Dec-2012 16:04:13 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973F\20121219-17691.b\F4457.D		
Lims ID:	MB	Client ID:	
Inject. Date:	19-Dec-2012 15:47:30	Dil. Factor:	1.0000
Sample Type:	MB		
Sample ID:	MB		
Misc. Info.:	480-0017691-007 =480-0017691-007		
Operator:	JMB	Instrument ID:	HP5973F
Purge Vol:	5.000 mL	ALS Bottle#:	7
Lims Batch ID:	96559	Lims Sample ID:	7
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973F\20121219-17691.b\F-8260 SOIL.m		
Last Update:	19-Dec-2012 16:04:12	Calib Date:	17-Dec-2012 14:47:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973F\20121217-17620.b\F4396.D		
Limit Group:	MV - 8260MCP_RCP		
Integrator:	RTE	ID Type:	RT Order ID
Column Type:	ZB-624	Column Dia:	0.25 mm
Process Host:	XAWRK020		

First Level Reviewer: ByrnesJ Date: 19-Dec-2012 16:01:24

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
* 1 1,4-Difluorobenzene	114	5.608	5.608	0.0	91	200022	50.0	
* 2 Chlorobenzene-d5	82	8.382	8.382	0.0	76	82914	50.0	
* 3 1,4-Dichlorobenzene-d4	152	10.700	10.700	0.0	89	85090	50.0	
$ 4 1,2-Dichloroethane-d4 (Surr)	67	5.304	5.304	0.0	98	✓ 26682	40.5	
$ 5 Toluene-d8 (Surr)	98	6.934	6.934	0.0	90	✓ 229235	47.8 ✓	
$ 6 4-Bromofluorobenzene (Surr)	174	9.599	9.599	0.0	90	✓ 68901	41.7	
10 Dichlorodifluoromethane	85		2.007					
11 Chlorodifluoromethane	51		2.019					
12 Chloromethane	50		2.159					9
13 Vinyl chloride	62		2.274					
14 Bromomethane	94		2.560					
15 Chloroethane	64		2.633					
16 Dichlorofluoromethane	67		2.810					
17 Trichlorofluoromethane	101		2.858					
18 Ethyl ether	59		3.035					
19 Propene oxide	58		3.132					
20 Acrolein	56		3.193					
21 1,1,2-Trichloro-1,2,2-trifluoroe	101		3.236					
22 1,1-Dichloroethene	96		3.260					
23 Acetone	43		3.309					
24 Isopropyl alcohol	45		3.394					
25 Iodomethane	142		3.424					
26 Carbon disulfide	76		3.473					
27 Methyl acetate	43		3.528					
28 3-Chloro-1-propene	41		3.540					9
29 Acetonitrile	40	3.564	3.564	0.0	58	592	5.24	
30 Methylene Chloride	84		3.649					9
31 2-Methyl-2-propanol	59		3.698					
32 Methyl tert-butyl ether	73		3.801					
34 trans-1,2-Dichloroethene	96		3.838					

Conc d8-toluene $= \frac{229235}{82914} \times \frac{50}{2.8919} = 47.8$ OK

%rec $= \frac{47.8}{50} = 96\%$ OK

Conc BFB $= \frac{68901}{82914} \times \frac{50}{.9954} = 41.7$

%rec $= \frac{41.7}{50} = 83\%$

JN 2/27/13

LCS - VOC

Report Date: 19-Dec-2012 15:59:01 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973F\20121219-17691.b\F4455.D		
Lims ID:	LCS	Client ID:	
Inject. Date:	19-Dec-2012 14:56:30	Dil. Factor:	1.0000
Sample Type:	LCS		
Sample ID:	LCS		
Misc. Info.:	480-0017691-005 =480-0017691-005		
Operator:	JMB	Instrument ID:	HP5973F
Purge Vol:	5.000 mL	ALS Bottle#:	5
Lims Batch ID:	96559	Lims Sample ID:	5
Detector:	MS SCAN		

Method:	\\Bufchrom\ChromData\HP5973F\20121219-17691.b\F-8260 SOIL.m		
Last Update:	19-Dec-2012 15:59:00	Calib Date:	17-Dec-2012 14:47:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973F\20121217-17620.b\F4396.D		
Limit Group:	MV - 8260MCP_RCP		
Integrator:	RTE	ID Type:	RT Order ID
Column Type:	ZB-624	Column Dia:	0.25 mm
Process Host:	XAWRK020		

First Level Reviewer: ByrnesJ Date: 19-Dec-2012 15:57:17

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
* 1 1,4-Difluorobenzene	114	5.608	5.608	0.0	91	260887	50.0	
* 2 Chlorobenzene-d5	82	8.382	8.382	0.0	74	115303	50.0	
* 3 1,4-Dichlorobenzene-d4	152	10.700	10.700	0.0	90	123550	50.0	
$ 4 1,2-Dichloroethane-d4 (Surr)	67	5.304	5.304	0.0	93	36327	42.2	
$ 5 Toluene-d8 (Surr)	98	6.935	6.934	0.001	90	287800	43.2	
$ 6 4-Bromofluorobenzene (Surr)	174	9.599	9.599	0.0	89	94962	41.4	
10 Dichlorodifluoromethane	85	2.001	2.007	-0.006	87	113680	90.1	
11 Chlorodifluoromethane	51	2.013	2.019	-0.006	73	83206	0	
12 Chloromethane	50	2.153	2.159	-0.006	89	56548	43.3	
13 Vinyl chloride	62	2.268	2.274	-0.006	81	60714	46.0	
14 Bromomethane	94	2.554	2.560	-0.006	78	18774	37.2	
15 Chloroethane	64	2.627	2.633	-0.006	83	19134	41.9	
16 Dichlorofluoromethane	67	2.804	2.810	-0.006	78	89306	0	
17 Trichlorofluoromethane	101	2.853	2.858	-0.006	81	76575	44.4	
18 Ethyl ether	59	3.029	3.035	-0.006	88	59660	37.3	
19 Propene oxide	58	3.126	3.132	-0.006	91	103699	0	
20 Acrolein	56	3.193	3.193	0.0	91	243706	884.1	
21 1,1,2-Trichloro-1,2,2-trifluoroe	101	3.224	3.236	-0.012	79	145283	94.0	
22 1,1-Dichloroethene	96	3.260	3.260	0.0	83	72228	49.0	
23 Acetone	43	3.309	3.309	0.0	98	137579	218.2	
24 Isopropyl alcohol	45	3.400	3.394	0.006	98	176823	0	
25 Iodomethane	142	3.418	3.424	-0.006	96	105686	44.3	
26 Carbon disulfide	76	3.473	3.473	0.0	98	216548	45.3	
27 Methyl acetate	43	3.528	3.528	0.0	82	96661	46.2	
28 3-Chloro-1-propene	41	3.564	3.540	0.024	38	591391	199.7	
29 Acetonitrile	40	3.564	3.564	0.0	97	277259	1880.9	
30 Methylene Chloride	84	3.649	3.649	0.0	81	83128	45.9	
31 2-Methyl-2-propanol	59	3.704	3.698	0.006	97	287952	767.9	
32 Methyl tert-butyl ether	73	3.808	3.801	0.007	87	211083	46.6	
34 trans-1,2-Dichloroethene	96	3.838	3.838	0.0	94	87388	49.6	

Conc Acetone $= \frac{137579}{260887} \times \frac{50}{.1208} = 218.27 \frac{ug}{kg}$ Sorec $= \frac{218.27}{250} = 87\%$ ✓

JR 2/27/13

LCS - VOC

Report Date: 19-Dec-2012 15:59:01 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973F\20121219-17691.b\F4455.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
33 Acrylonitrile	53	3.856	3.856	0.0	98	183101	230.8	
35 Hexane	57	3.972	3.978	-0.006	89	136179	0	
36 Isopropyl ether	45	4.130	4.130	0.0	71	272705	42.0	
134 Halothane	117	4.130	4.130	0.0	0	72429	66.3	
37 Vinyl acetate	43	4.154	4.160	-0.006	97	928515	286.8	
39 1,1-Dichloroethane	63	4.179	4.179	0.0	68	140656	50.2	
38 1,1-Dimethoxyethane	75	4.203	4.203	0.0	64	119693	0	
40 2-Chloro-1,3-butadiene	53	4.227	4.227	0.0	86	128723	0	
41 Tert-butyl ethyl ether	59	4.416	4.416	0.0	97	249657	41.7	
42 Ethyl acetate	43	4.617	4.617	0.0	93	326678	0	
43 2-Butanone (MEK)	43	4.617	4.623	-0.006	98	326678	321.2	
44 2,2-Dichloropropane	77	4.629	4.629	0.0	61	110611	50.7	
45 cis-1,2-Dichloroethene	96	4.635	4.635	0.0	69	94273	48.8	
46 Propionitrile	54	4.720	4.720	0.0	97	167363	432.6	
47 Methacrylonitrile	41	4.818	4.817	0.001	90	50796	0	
48 Chlorobromomethane	128	4.842	4.842	0.0	87	48766	49.0	
49 Tetrahydrofuran	42	4.860	4.860	0.0	90	158838	237.5	
50 Chloroform	83	4.878	4.878	0.0	69	132326	48.6	
51 1,1,1-Trichloroethane	97	5.024	5.024	0.0	91	117816	48.5	
52 Cyclohexane	56	5.055	5.055	0.0	87	131862	44.4	
54 1,1-Dichloropropene	75	5.140	5.146	-0.006	94	108490	51.1	
55 Carbon tetrachloride	117	5.152	5.152	0.0	79	102954	49.2	
53 Isobutyl alcohol	43	5.201	5.201	0.0	91	275656	0	
57 Benzene	78	5.329	5.335	-0.005	95	320409	48.1	
56 Tert-amyl methyl ether	73	5.347	5.347	0.0	95	232517	44.1	
58 1,2-Dichloroethane	62	5.365	5.365	0.0	74	96352	46.5	
59 n-Heptane	43	5.420	5.420	0.0	91	140651	43.5	
136 2,4,4-Trimethyl-1-pentene	55	5.736	5.742	-0.006	0	101053	52.0	
60 n-Butanol	56	5.748	5.742	0.006	85	242860	0	
62 Trichloroethene	95	5.858	5.858	0.0	89	87165	49.7	
135 2,4,4-Trimethyl-2-pentene	97	5.919	5.918	0.001	0	229845	54.6	
64 Methylcyclohexane	83	5.992	5.992	0.0	85	141767	45.2	
65 1,2-Dichloropropane	63	6.077	6.077	0.0	94	78181	48.5	
63 Methyl methacrylate	41	6.083	6.089	-0.006	94	120715	62.4	
66 1,4-Dioxane	88	6.174	6.186	-0.012	89	59425	1717.7	
67 Dibromomethane	93	6.211	6.211	0.0	83	46428	49.1	
68 Dichlorobromomethane	83	6.320	6.320	0.0	92	93813	47.9	
69 2-Chloroethyl vinyl ether	63	6.527	6.527	0.0	90	264511	237.0	
70 2-Nitropropane	43	6.527	6.533	-0.006	97	288075	438.4	
71 Epichlorohydrin	57	6.649	6.648	0.001	97	254425	0	
72 cis-1,3-Dichloropropene	75	6.703	6.703	0.0	81	127302	50.2	
73 4-Methyl-2-pentanone (MIBK)	43	6.801	6.801	0.0	95	449361	222.7	
74 Toluene	92	6.995	6.995	0.0	92	218309	47.0 ✓	
75 Ethyl methacrylate	69	7.214	7.214	0.0	87	105411	48.2	
77 trans-1,3-Dichloropropene	75	7.221	7.220	0.001	92	112751	48.8	
79 1,1,2-Trichloroethane	83	7.415	7.415	0.0	84	59114	48.1	
81 Tetrachloroethene	166	7.519	7.525	-0.006	90	107206	49.1	
82 1,3-Dichloropropane	76	7.586	7.585	0.001	92	119509	46.8	
80 2-Hexanone	43	7.592	7.592	0.0	94	332286	229.6	
83 Chlorodibromomethane	129	7.829	7.829	0.0	85	81090	46.8	
84 Ethylene Dibromide	107	7.963	7.963	0.0	96	82390	48.3	
86 4-Chlorobenzotrifluoride	180	8.303	8.303	0.0	90	162334	0	

gr 2/27/13

$Conc_{Toluene} = \frac{218309}{115303} \times \frac{50}{2.0133} = 47.0$ OK $\%Rec = \frac{47}{50} = 94\%$ ✓

LCS/Surrs. - VOC

Report Date: 19-Dec-2012 15:59:01 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973F\20121219-17691.b\F4455.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
85 3-Chlorobenzotrifluoride	180	8.364	8.364	0.0	86	159921	0	
87 Chlorobenzene	112	8.413	8.413	0.0	96	260623	46.4	
88 Ethylbenzene	91	8.474	8.474	0.0	97	408528	48.6	
89 1,1,1,2-Tetrachloroethane	131	8.492	8.492	0.0	85	88258	47.7	
90 m-Xylene & p-Xylene	106	8.589	8.589	0.0	100	344727	96.7	
91 o-Xylene	106	9.021	9.021	0.0	95	165956	47.8	
92 Styrene	104	9.046	9.045	0.001	95	277985	49.2	
93 2-Chlorobenzotrifluoride	180	9.295	9.295	0.0	96	159306	0	
95 Bromoform	173	9.325	9.319	0.006	95	53859	47.6	
94 Isopropylbenzene	105	9.386	9.386	0.0	94	429613	50.5	
96 Cyclohexanone	55	9.581	9.581	0.0	89	182767	0	
97 1,1,2,2-Tetrachloroethane	83	9.757	9.757	0.0	78	105519	50.9	
101 Bromobenzene	156	9.770	9.769	0.001	86	115925	47.5	
98 trans-1,4-Dichloro-2-butene	53	9.800	9.800	0.0	55	131070	251.0	
100 1,2,3-Trichloropropane	110	9.812	9.812	0.0	70	34783	49.3	
103 2-Chlorotoluene	126	9.928	9.928	0.0	98	114295	49.5	
102 1,3,5-Trimethylbenzene	105	9.958	9.964	-0.006	92	363782	50.7	
104 3-Chlorotoluene	126	9.989	9.988	0.001	83	134667	0	
99 N-Propylbenzene	91	10.031	10.031	0.0	52	318847	53.5	
105 4-Chlorotoluene	126	10.031	10.031	0.0	96	119575	50.3	
106 tert-Butylbenzene	134	10.281	10.280	0.001	87	89125	50.0	
107 1,2,4-Trimethylbenzene	105	10.329	10.329	0.0	94	363446	51.0	
108 Pentachloroethane	167	10.360	10.359	0.001	87	59853	0	
109 sec-Butylbenzene	105	10.481	10.481	0.0	92	471872	51.4	
110 4-Isopropyltoluene	119	10.603	10.603	0.0	94	438366	52.7	
111 1,3-Dichlorobenzene	146	10.646	10.645	0.001	89	223479	48.1	
114 Dicyclopentadiene	66	10.719	10.718	0.001	96	400731	0	
113 1,4-Dichlorobenzene	146	10.725	10.725	0.0	82	222063	46.6	
112 1,2,3-Trimethylbenzene	105	10.731	10.731	0.001	93	382255	0	
115 n-Butylbenzene	91	10.974	10.974	0.0	93	348886	53.0	
116 1,2-Dichlorobenzene	146	11.065	11.065	0.0	98	210454	47.5	
117 1,2-Dibromo-3-Chloropropane	75	11.741	11.741	0.0	77	19564	55.5	
118 1,3,5-Trichlorobenzene	180	11.862	11.862	0.0	97	173305	0	
119 1,2,4-Trichlorobenzene	180	12.385	12.385	0.0	94	141673	51.9	
120 Hexachlorobutadiene	225	12.483	12.483	0.0	94	77676	54.1	
121 Naphthalene	128	12.623	12.623	0.0	96	388247	53.5	
122 1,2,3-Trichlorobenzene	180	12.842	12.842	0.0	95	125818	52.2	
S 125 1,2-Dichloroethene, Total	1				0		98.3	
S 126 1,3-Dichloropropene, Total	1				0		99.0	
S 124 Xylenes, Total	1				0		144.5	

Conc d_8-toluene (surr) $= \frac{287800}{115303} \times \frac{50}{2.8919} = 43.16$ ok

$\%rec = \frac{43.16}{50} = 86\%$ ok

2/27/13

Sample - VOC

Report Date: 20-Dec-2012 14:27:09 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973F\20121219-17691.b\F4463.D		
Lims ID:	480-30406-I-3-A	Client ID:	OC-SD-SD-501-XXX
Inject. Date:	19-Dec-2012 18:46:30	Dil. Factor:	1.0000
Sample Type:	Client		
Sample ID:	480-30406-I-3-A		
Misc. Info.:	480-0017691-013 =480-0017691-013		
Operator:	JMB	Instrument ID:	HP5973F
Purge Vol:	5.000 mL	ALS Bottle#:	13
Lims Batch ID:	96559	Lims Sample ID:	13
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973F\20121219-17691.b\F-8260 SOIL.m		
Last Update:	20-Dec-2012 14:27:08	Calib Date:	17-Dec-2012 14:47:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973F\20121217-17620.b\F4396.D		
Limit Group:	MV - 8260MCP_RCP		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	ZB-624	Column Dia:	0.25 mm
Process Host:	XAWRK010		

First Level Reviewer: ByrnesJ Date: 20-Dec-2012 14:26:24

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
* 1 1,4-Difluorobenzene	114	5.608	5.608	0.0	92	267592	50.0	
* 2 Chlorobenzene-d5	82	8.382	8.382	0.0	75	117283	50.0	
* 3 1,4-Dichlorobenzene-d4	152	10.700	10.700	0.0	91	128799	50.0	
$ 4 1,2-Dichloroethane-d4 (Surr)	67	5.304	5.304	0.0	99	41318	46.8	
$ 5 Toluene-d8 (Surr)	98	6.935	6.934	0.001	81	304672	44.9 ✓	
$ 6 4-Bromofluorobenzene (Surr)	174	9.599	9.599	0.0	92	102900	44.1 ✓	
10 Dichlorodifluoromethane	85		2.007					
12 Chloromethane	50		2.159					
13 Vinyl chloride	62		2.274					
14 Bromomethane	94		2.560					
15 Chloroethane	64		2.633					
17 Trichlorofluoromethane	101		2.858					
18 Ethyl ether	59		3.035					
21 1,1,2-Trichloro-1,2,2-trifluoroe	101		3.236					
22 1,1-Dichloroethene	96		3.260					
23 Acetone	43	3.309	3.309	0.0	96	76690	118.6 ✓	
26 Carbon disulfide	76		3.473					
27 Methyl acetate	43		3.528					
30 Methylene Chloride	84		3.649					
32 Methyl tert-butyl ether	73	3.808	3.801	0.007	42	7735	1.66	
34 trans-1,2-Dichloroethene	96		3.838					
36 Isopropyl ether	45		4.130					
39 1,1-Dichloroethane	63		4.179					
41 Tert-butyl ethyl ether	59		4.416					
43 2-Butanone (MEK)	43	4.623	4.623	0.0	91	28253	27.1	
44 2,2-Dichloropropane	77		4.629					
45 cis-1,2-Dichloroethene	96		4.635					
48 Chlorobromomethane	128		4.842					
49 Tetrahydrofuran	42		4.860					
50 Chloroform	83		4.878					

Conc d8-toluene $= \frac{304672}{117283} \times \frac{50}{2.8919} = 44.91$ OK

%rec $= \frac{44.91}{50} = 90\%$ OK

Conc Acetone $= \frac{76690}{267592} \times \frac{50}{.1208} \times \frac{5}{6.89} \times \frac{1}{.715} = 120.\ \frac{ug}{kg}$ OK

2/27/13

Sample - VOC

Report Date: 20-Dec-2012 14:27:09 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973F\20121219-17691.b\F4463.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
51 1,1,1-Trichloroethane	97		5.024					
52 Cyclohexane	56		5.055					
54 1,1-Dichloropropene	75		5.146					
55 Carbon tetrachloride	117		5.152					
57 Benzene	78		5.335					
56 Tert-amyl methyl ether	73	5.347	5.347	0.0	32	4238	0.7829	
58 1,2-Dichloroethane	62		5.365					
136 2,4,4-Trimethyl-1-pentene	55		5.742					
62 Trichloroethene	95		5.858					
135 2,4,4-Trimethyl-2-pentene	97		5.918					
64 Methylcyclohexane	83		5.992					
65 1,2-Dichloropropane	63		6.077					
66 1,4-Dioxane	88		6.186					
67 Dibromomethane	93		6.211					
68 Dichlorobromomethane	83		6.320					
72 cis-1,3-Dichloropropene	75		6.703					
73 4-Methyl-2-pentanone (MIBK)	43		6.801					9
74 Toluene	92	6.995	6.995	0.0	45	4577	0.9692 ✓	
77 trans-1,3-Dichloropropene	75		7.220					
79 1,1,2-Trichloroethane	83		7.415					
81 Tetrachloroethene	166		7.525					
82 1,3-Dichloropropane	76		7.585					
80 2-Hexanone	43		7.592					9
83 Chlorodibromomethane	129		7.829					
84 Ethylene Dibromide	107		7.963					
87 Chlorobenzene	112		8.413					
88 Ethylbenzene	91		8.474					
89 1,1,1,2-Tetrachloroethane	131		8.492					
90 m-Xylene & p-Xylene	106		8.589					9
91 o-Xylene	106		9.021					
92 Styrene	104		9.045					
95 Bromoform	173		9.319					
94 Isopropylbenzene	105		9.386					
97 1,1,2,2-Tetrachloroethane	83		9.757					
101 Bromobenzene	156		9.769					
100 1,2,3-Trichloropropane	110		9.812					
103 2-Chlorotoluene	126		9.928					
102 1,3,5-Trimethylbenzene	105		9.964					9
99 N-Propylbenzene	91		10.031					9
105 4-Chlorotoluene	126		10.031					
106 tert-Butylbenzene	134		10.280					
107 1,2,4-Trimethylbenzene	105	10.335	10.329	0.006	1	2542	0.3424	
109 sec-Butylbenzene	105		10.481					9
110 4-Isopropyltoluene	119		10.603					9
111 1,3-Dichlorobenzene	146		10.645					
113 1,4-Dichlorobenzene	146		10.725					
115 n-Butylbenzene	91		10.974					
116 1,2-Dichlorobenzene	146		11.065					
117 1,2-Dibromo-3-Chloropropane	75		11.741					
119 1,2,4-Trichlorobenzene	180		12.385					
120 Hexachlorobutadiene	225		12.483					
121 Naphthalene	128		12.623					9

Conc Toluene = $\frac{4577}{117283} \times \frac{50}{2.0133} \times \frac{5}{6.89} \times \frac{1}{.715}$

= 0.9837 ug/kg OK

Conc BFB = $\frac{102900}{\cancel{128799}\ 117283} \times \frac{50}{.9954}$ = 44.07 OK

% rec = $\frac{44.07}{50}$ = 88% OK

2/27/13

DFTPP - SVOC

Report Date: 21-Dec-2012 10:40:08 Chrom Revision: 2.0 22-Oct-2012 16:30:48

Data File: \\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3221.D\X-8270LL.rslt\spectra.d
Injection Date: 21-Dec-2012 09:57:30
Spectrum: Tune Spec: Scans 772-774(7.20-7.21) Bgrd 768(7.18)
Base Peak: 442.00
Minimum % Base Peak: 0
Number of Points: 348

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	1386	137.00	10813	226.00	4107	324.00	3274
37.00	2190	138.00	1541	227.00	66016	326.00	987
38.00	6987	139.00	1630	228.00	8374	327.00	5408
39.00	36032	140.00	2154	229.00	11393	328.00	1790
40.00	2428	141.00	33592	230.00	1581	329.00	1134
43.00	741	142.00	10512	231.00	5432	330.00	195
44.00	244	143.00	4355	232.00	1224	332.00	2119
45.00	1455	144.00	1940	233.00	1599	333.00	2905
47.00	479	145.00	1720	234.00	3438	334.00	17856
48.00	673	146.00	4909	235.00	4954	335.00	4329
49.00	6758	147.00	14747	236.00	1987	336.00	636
50.00	139648	148.00	38104	237.00	4950	337.00	178
51.00	500800	149.00	7740	239.00	4116	339.00	794
52.00	23304	150.00	1594	240.00	1859	340.00	174
53.00	1092	151.00	2443	241.00	3470	341.00	2874
54.00	884	152.00	995	242.00	8946	342.00	753
55.00	235	153.00	10603	243.00	3900	343.00	520
56.00	13242	154.00	7580	244.00	104792	346.00	6022
57.00	30304	155.00	16584	245.00	12388	347.00	1221
58.00	1183	156.00	29128	246.00	24928	348.00	176
60.00	994	157.00	5186	247.00	5810	350.00	1055
61.00	5849	158.00	5123	248.00	1117	351.00	853
62.00	9691	159.00	3613	249.00	3500	352.00	9433
63.00	19256	160.00	9849	250.00	530	353.00	6277
64.00	2284	161.00	14982	251.00	1729	354.00	7549
65.00	6587	162.00	3115	252.00	1841	355.00	2129
66.00	1309	163.00	1690	253.00	3716	356.00	329
69.00	419008	164.00	885	255.00	549888	362.00	170
70.00	2486	165.00	13497	256.00	76984	363.00	394
73.00	2510	166.00	8911	257.00	7001	364.00	1128
74.00	48552	167.00	53400	258.00	34648	365.00	38344
75.00	81328	168.00	22088	259.00	6756	366.00	4312
76.00	22976	169.00	5724	260.00	1519	369.00	225

m/z $\frac{51}{198} = \frac{500800}{926208} = 54.07$ OK

2/21/13

DFTPP - SVOC

Report Date: 21-Dec-2012 10:40:08 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3221.D\X-8270LL.rslt\spectra.d
Injection Date: 21-Dec-2012 09:57:30
Spectrum: Tune Spec: Scans 772-774(7.20-7.21) Bgrd 768(7.18)
Base Peak: 442.00
Minimum % Base Peak: 0
Number of Points: 348

m/z	Y	m/z	Y	m/z	Y	m/z	Y
77.00	480256	170.00	3455	261.00	909	370.00	1189
78.00	31152	171.00	605	262.00	391	371.00	1428
79.00	41912	172.00	6810	263.00	987	372.00	15406
80.00	32280	173.00	7935	265.00	11413	373.00	3940
81.00	39376	174.00	12948	266.00	262	374.00	212
82.00	9405	175.00	22592	268.00	790	375.00	169
83.00	7532	176.00	6319	269.00	605	377.00	252
84.00	2174	177.00	11145	270.00	937	381.00	191
85.00	7693	178.00	5668	271.00	2317	383.00	3442
86.00	10474	179.00	46104	272.00	2166	384.00	1544
87.00	5253	180.00	30232	273.00	20832	385.00	195
88.00	1752	181.00	15482	274.00	51288	386.00	386
91.00	11328	182.00	1216	275.00	263808	387.00	251
92.00	10506	183.00	1675	276.00	28968	389.00	353
93.00	72576	184.00	6600	277.00	24384	390.00	1988
94.00	4761	185.00	22496	278.00	4199	391.00	1986
95.00	2488	186.00	154368	279.00	846	392.00	794
96.00	1537	187.00	44520	280.00	607	393.00	490
98.00	56112	188.00	5729	281.00	809	396.00	195
99.00	37584	189.00	12779	282.00	935	397.00	382
100.00	3797	190.00	1989	283.00	3481	401.00	378
101.00	24392	191.00	4155	284.00	2274	402.00	5196
102.00	1332	192.00	12631	285.00	4164	403.00	9937
103.00	6980	193.00	14515	286.00	165	404.00	2294
104.00	14090	194.00	4388	287.00	259	408.00	214
105.00	13615	195.00	2403	288.00	780	410.00	387
107.00	174336	196.00	28536	290.00	1549	412.00	642
108.00	25432	198.00	926208	292.00	410	415.00	222
110.00	268096	199.00	65232	293.00	5043	417.00	204
111.00	42096	200.00	4486	294.00	1364	418.00	679
112.00	5661	201.00	3097	295.00	881	419.00	702
113.00	1690	203.00	7932	296.00	80464	420.00	520
114.00	422	204.00	36216	297.00	11777	421.00	8502
115.00	1698	205.00	66504	298.00	401	422.00	6351

m/z $\frac{199}{198} = \frac{65232}{926208} = 7.043$ OK

JR 2/21/13

DFTPP-5ND

Report Date: 21-Dec-2012 10:40:08 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3221.D\X-8270LL.rslt\spectra.d
Injection Date: 21-Dec-2012 09:57:30
Spectrum: Tune Spec: Scans 772-774(7.20-7.21) Bgrd 768(7.18)
Base Peak: 442.00
Minimum % Base Peak: 0
Number of Points: 348

m/z	Y	m/z	Y	m/z	Y	m/z	Y
116.00	11264	206.00	249280	301.00	895	423.00	53408
117.00	161152	207.00	30792	302.00	1176	424.00	8626
118.00	12211	208.00	11439	303.00	8975	425.00	1752
119.00	1703	209.00	4585	304.00	1112	427.00	1460
120.00	628	210.00	6291	305.00	256	428.00	941
121.00	1505	211.00	7724	307.00	562	430.00	323
122.00	13004	212.00	830	308.00	576	431.00	437
123.00	16808	213.00	1358	309.00	872	432.00	189
124.00	7467	214.00	216	310.00	679	434.00	254
125.00	8370	215.00	3189	312.00	499	436.00	430
127.00	524928	216.00	6975	313.00	850	437.00	238
128.00	43736	217.00	71432	314.00	4448	438.00	734
129.00	245888	218.00	8497	315.00	10191	439.00	423
130.00	18368	219.00	257	316.00	3826	441.00	131072
131.00	2050	220.00	1332	317.00	691	442.00	950400
132.00	3447	221.00	29416	318.00	409	443.00	185344
133.00	1515	222.00	4492	320.00	896	444.00	15445
134.00	8218	223.00	16968	321.00	1728	445.00	831
135.00	16432	224.00	133504	322.00	851	464.00	418
136.00	9652	225.00	36536	323.00	24792	478.00	192

m/z $\frac{442}{198} = \frac{950400}{926208} = 102.62$ OK

2/21/13

ICAL - SVOC

Report Date: 18-Dec-2012 16:43:07 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3134.D		
Lims ID:	IC - 2.5	Client ID:	
Inject. Date:	18-Dec-2012 12:36:30	Dil. Factor:	1.0000
Sample Type:	IC	Calib Level:	4
Sample ID:	480-0017654-005		
Misc. Info.:			
Operator:	ANM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	6
Lims Batch ID:	96347	Lims Sample ID:	5
Sublist:	chrom-X-8270LL*sub20		
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X-8270LL.m		
Last Update:	18-Dec-2012 16:43:06	Calib Date:	18-Dec-2012 14:44:30
Quant Method:	Internal Standard	Quant By:	Continuing Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3139.D		
Limit Group:	MB - 8270RCP_MCP ICAL		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Process Host:	XAWRK017		

$RRF_{Phenol} = \frac{163955}{196485} \times \frac{5.0}{2.5} = 1.6689$

RRF_{Phenol} = 1.2105, 1.3401, 1.6689, 1.4788, 1.6176, 1.5984, 1.6898, 1.5805 = 1.523

First Level Reviewer: mckernar Date: 18-Dec-2012 16:43:06

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.594	6.594	0.0	85	196485	5.00	
* 2 Naphthalene-d8	136	8.486	8.486	0.0	97	777218	5.00	
* 3 Acenaphthene-d10	164	11.116	11.116	0.0	86	498099	5.00	
* 4 Phenanthrene-d10	188	13.128	13.128	0.0	94	831985	5.00	
* 5 Chrysene-d12	240	15.767	15.767	0.0	93	773124	5.00	
* 6 Perylene-d12	264	17.051	17.051	0.0	97	742660	5.00	
$ 7 2-Fluorophenol	112	4.701	4.701	0.0	66	111406	2.50	
$ 8 Phenol-d5	99	6.118	6.118	0.0	84	134813	2.48	
$ 9 Nitrobenzene-d5	82	7.435	7.435	0.0	87	149020	2.56	
$ 10 2-Fluorobiphenyl	172	10.127	10.127	0.0	93	327537	2.62	
$ 11 2,4,6-Tribromophenol	330	12.291	12.291	0.0	34	37478	2.45	
$ 12 p-Terphenyl-d14	244	14.802	14.802	0.0	92	381301	2.56	
18 1,4-Dioxane	88	2.466	2.466	0.0	65	51855	2.47	M
19 N-Nitrosodimethylamine	42	2.813	2.813	0.0	59	92572	2.58	M
20 Pyridine	52	2.908	2.908	0.0	55	100467	2.76	M
21 Benzaldehyde	77	5.961	5.961	0.0	87	113145	2.94	
23 Aniline	93	6.128	6.128	0.0	92	203774	2.83	
22 Phenol	94	6.142	6.142	0.0	44	163955	2.74	M
24 Bis(2-chloroethyl)ether	93	6.223	6.223	0.0	91	124678	2.65	
25 2-Chlorophenol	128	6.294	6.294	0.0	94	139058	2.73	
26 1,3-Dichlorobenzene	146	6.503	6.503	0.0	94	167759	2.66	
27 1,4-Dichlorobenzene	146	6.622	6.622	0.0	69	182861	2.90	
29 1,2-Dichlorobenzene	146	6.841	6.841	0.0	81	166114	2.83	
28 Benzyl alcohol	108	6.846	6.846	0.0	68	51260	3.22	M
32 2,2'-oxybis[1-chloropropane]	45	7.022	7.022	0.0	71	206722	2.70	
31 2-Methylphenol	108	7.031	7.031	0.0	66	114323	2.68	
33 Acetophenone	105	7.212	7.212	0.0	89	194399	2.67	
34 N-Nitrosodi-n-propylamine	70	7.217	7.217	0.0	87	99867	2.73	
36 4-Methylphenol	108	7.288	7.288	0.0	73	102383	2.37	M

$\frac{\text{OK}}{\%RSD = \frac{.169}{1.523} = 11.1\%}$ OK (11.0)

jr 2/21/13

IRAL - SVOC

Report Date: 18-Dec-2012 16:43:07 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3134.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
37 Hexachloroethane	117	7.331	7.331	0.0	92	73168	2.89	
38 Nitrobenzene	77	7.464	7.464	0.0	78	166093	2.75	
40 Isophorone	82	7.821	7.821	0.0	75	248371	2.50	
41 2-Nitrophenol	139	7.939	7.939	0.0	93	67259	2.44	
43 2,4-Dimethylphenol	107	8.058	8.058	0.0	84	135144	2.60	M
45 Bis(2-chloroethoxy)methane	93	8.177	8.177	0.0	93	150792	2.56	
44 Benzoic acid	105	8.268	8.268	0.0	84	89300	3.85	M
47 2,4-Dichlorophenol	162	8.358	8.358	0.0	0	111825	2.65	M
48 1,2,4-Trichlorobenzene	180	8.410	8.410	0.0	92	128556	2.48	
49 Naphthalene RRF = $\frac{448321 \times 5}{777218 \times \cancel{8}\ 2.5}$	128	8.520	8.520	0.0	91	448321	2.60	
51 4-Chloroaniline	127	8.662	8.662	0.0	91	156755	2.52	M
52 Hexachlorobutadiene	225	8.710	8.710	0.0	74	77304	2.72	
54 Caprolactam = 1.1537	113	9.209	9.209	0.0	61	45612	2.97	M
55 4-Chloro-3-methylphenol OK	107	9.466	9.466	0.0	60	135114	2.89	M
56 2-Methylnaphthalene	142	9.566	9.566	0.0	76	307828	2.55	
57 1-Methylnaphthalene	142	9.709	9.709	0.0	88	285503	2.57	
58 Hexachlorocyclopentadiene	237	9.794	9.794	0.0	68	25663	1.58	
59 1,2,4,5-Tetrachlorobenzene	216	9.818	9.818	0.0	85	136160	2.91	
60 2,4,6-Trichlorophenol	196	10.037	10.037	0.0	76	72851	2.53	M
61 2,4,5-Trichlorophenol	196	10.146	10.146	0.0	72	73198	2.63	M
62 1,1'-Biphenyl	154	10.274	10.274	0.0	98	378332	2.63	
63 2-Chloronaphthalene	162	10.317	10.317	0.0	88	323689	2.53	
64 Phenyl ether	170	10.436	10.436	0.0	90	206565	2.64	
65 2-Nitroaniline	65	10.512	10.512	0.0	82	71533	2.17	
66 1,4-Dinitrobenzene	75	10.755	10.755	0.0	76	62491	0	M
67 Dimethyl phthalate	163	10.779	10.779	0.0	88	340849	2.64	
68 2,6-Dinitrotoluene	165	10.864	10.864	0.0	88	146693	2.51	
69 Acenaphthylene	152	10.907	10.907	0.0	81	462652	2.66	
70 3-Nitroaniline	138	11.159	11.159	0.0	1	74904	2.58	M
71 Acenaphthene	153	11.169	11.169	0.0	89	302406	2.49	
72 2,4-Dinitrophenol	184	11.349	11.349	0.0	40	35900	3.89	M
73 Dibenzofuran	168	11.440	11.440	0.0	98	406272	2.75	
74 2,4-Dinitrotoluene	165	11.492	11.492	0.0	1	82195	2.20	
75 4-Nitrophenol	109	11.611	11.611	0.0	26	117392	4.71	M
76 2,3,4,6-Tetrachlorophenol	232	11.668	11.668	0.0	68	68881	3.08	M
78 Diethyl phthalate	149	11.825	11.825	0.0	93	375633	2.66	
79 Fluorene	166	11.934	11.934	0.0	94	356637	2.63	
80 4-Chlorophenyl phenyl ether	204	11.953	11.953	0.0	84	144079	2.40	
81 4-Nitroaniline	138	12.067	12.067	0.0	77	71047	2.52	M
82 4,6-Dinitro-2-methylphenol	198	12.082	12.082	0.0	62	63572	3.78	
84 Diphenylamine	169	12.124	12.124	0.0	96	553188	2.86	
83 N-Nitrosodiphenylamine	169	12.124	12.124	0.0	96	553188	2.86	
16 1,2-Diphenylhydrazine	77	12.167	12.167	0.0	94	326470	2.61	
85 Azobenzene	77	12.167	12.167	0.0	95	326470	2.62	
86 Benzophenone	105	12.191	12.191	0.0	97	328414	2.77	
89 4-Bromophenyl phenyl ether	248	12.595	12.595	0.0	82	81359	2.61	
91 Hexachlorobenzene 1.0861	284	12.652	12.652	0.0	69	87913	2.72	
92 Simazine .9997	201	12.809	12.809	0.0	76	42920	0	
93 Atrazine 1.0433	200	12.838	12.838	0.0	78	191176	5.10	
95 Pentachloronitrobenzene 1.0936	237	12.923	12.923	0.0	56	34231	2.23	
94 Pentachlorophenol 1.1795	266	12.933	12.933	0.0	52	54999	4.13	
97 Phenanthrene 1.1537	178	13.156	13.156	0.0	92	518661	2.80	

RRF = 1.0933
Naph. 1.1148
1.1246
/9 = 1.1076 OK

JR 2/21/13

S.RSD = $\frac{.0596}{1.1076}$ = 5.4% OK

IRAL - SVOC

Report Date: 18-Dec-2012 16:43:07 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3134.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
98 Anthracene	178	13.218	13.218	0.0	94	507614	2.69	
99 Carbazole	167	13.427	13.427	0.0	98	459119	2.62	
101 Alachlor	160	13.565	13.565	0.0	88	93462	0	
102 Di-n-butyl phthalate	149	13.803	13.803	0.0	96	589349	2.90	
104 Fluoranthene	202	14.431	14.431	0.0	96	506028	2.76	
105 Benzidine	184	14.597	14.597	0.0	99	241214	2.82	
106 Pyrene	202	14.654	14.654	0.0	97	527811	2.55	
107 Famphur	218	15.201	15.201	0.0	79	177139	0	
108 Butyl benzyl phthalate	149	15.244	15.244	0.0	92	281281	2.46	
110 Bis(2-ethylhexyl) phthalate	149	15.734	15.734	0.0	95	384752	2.44	
109 3,3'-Dichlorobenzidine	252	15.743	15.743	0.0	81	174974	2.52	
111 Benzo[a]anthracene	228	15.753	15.753	0.0	93	384718	2.31	
112 Chrysene	228	15.791	15.791	0.0	87	491288	2.60	
113 Di-n-octyl phthalate	149	16.271	16.271	0.0	97	617182	2.48	
114 Benzo[b]fluoranthene	252	16.695	16.695	0.0	90	421949	2.45	
115 Benzo[k]fluoranthene	252	16.718	16.718	0.0	99	489235	2.75	
116 Benzo[a]pyrene	252	17.004	17.004	0.0	69	433943	2.60	
118 Dibenz(a,h)anthracene	278	18.150	18.150	0.0	47	361538	2.39	M
117 Indeno[1,2,3-cd]pyrene	276	18.150	18.150	0.0	93	413973	2.33	
119 Benzo[g,h,i]perylene	276	18.468	18.468	0.0	89	331317	2.23	M
S 121 3-Methylphenol	1		0.000					

QC Flag Legend

Review Flags
M - Manually Integrated

RRF Acenaphthene $= \frac{302406}{498099} \times \frac{5}{2.5} = 1.214$ OK

$\overline{RRF}$ Acenapth. = 1.6440, 1.2341, 1.1911, 1.2142, 1.0960, 1.1655, 1.1730, 1.1505, 1.0920 / 9 = 1.2178 OK

%RSD $= \frac{.1668}{1.2178} = 13.7$ OK (14.)

RRF Phenanthrene $= \frac{518661}{331985} \times \frac{5}{2.5} = 1.2468$ OK

$\overline{RRF}$ Phenanthrene = 1.0661, 1.1412, 1.1507, 1.2468, 1.0855, 1.1266, 1.1057, 1.1133, .995 / 9 = 1.1145 OK

%RSD $= \frac{.0682}{1.1145} = 6.1$ % OK

RRF Chrysene $= \frac{491288}{773124} \times \frac{5}{2.5} = 1.2709$ OK

$\overline{RRF}$ Chrysene = 1.6341, 1.5279, 1.2709, 1.0332, 1.1158, 1.1010, 1.0703, 1.0217 / 8 = 1.22186

%RSD $= \frac{.236}{1.22186} = 19.3$ % OK (19.0)

RRF Indeno(1,2,3-cd)Pyrene $= \frac{413973}{742660} \times \frac{5}{2.5} = 1.1148$ OK

%RSD $= \frac{.11297}{1.19835} = 9.4$ % OK

gr 2/21/13

CCAL-SVOC

Report Date: 21-Dec-2012 10:40:05 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3222.D		
Lims ID:	CCVIS	Client ID:	
Inject. Date:	21-Dec-2012 10:13:30	Dil. Factor:	1.0000
Sample Type:	CCVIS		
Sample ID:	480-0017772-002		
Misc. Info.:			
Operator:	ANM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	3
Lims Batch ID:	97046	Lims Sample ID:	2
Sublist:	chrom-X-8270LL*sub20		
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973X\20121221-17772.b\X-8270LL.m		
Last Update:	21-Dec-2012 10:40:05	Calib Date:	18-Dec-2012 14:44:30
Quant Method:	Internal Standard	Quant By:	Continuing Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3139.D		
Limit Group:	MB - 8270RCP_MCP ICAL		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Process Host:	XAWRK035		

$RRF_{Phenol} = \frac{580081}{198819} \times \frac{5.0}{8.0} = 1.8235$ OK

$S.D = \frac{1.824 - 1.523}{1.523} = 19.7$ OK

First Level Reviewer: mckernar Date: 21-Dec-2012 10:40:05

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.599	6.599	0.0	83	198819	5.00	
* 2 Naphthalene-d8	136	8.491	8.491	0.0	96	779062	5.00	
* 3 Acenaphthene-d10	164	11.107	11.107	0.0	90	510619	5.00	
* 4 Phenanthrene-d10	188	13.114	13.114	0.0	97	898941	5.00	
* 5 Chrysene-d12	240	15.767	15.767	0.0	95	702599	5.00	
* 6 Perylene-d12	264	17.056	17.056	0.0	98	707467	5.00	
$ 7 2-Fluorophenol	112	4.677	4.677	0.0	70	407719	9.04	
$ 8 Phenol-d5	99	6.109	6.109	0.0	87	522097	9.51	
$ 9 Nitrobenzene-d5	82	7.431	7.431	0.0	82	529172	9.06	
$ 10 2-Fluorobiphenyl	172	10.122	10.122	0.0	95	1111299	8.67	
$ 11 2,4,6-Tribromophenol	330	12.262	12.262	0.0	72	141783	8.57	
$ 12 p-Terphenyl-d14	244	14.792	14.792	0.0	95	1190783	8.79	
18 1,4-Dioxane	88	2.452	2.452	0.0	73	176397	8.68	
19 N-Nitrosodimethylamine	42	2.785	2.785	0.0	71	322807	8.89	
20 Pyridine	52	2.851	2.851	0.0	76	331809	9.00	
21 Benzaldehyde	77	5.952	5.952	0.0	90	361903	9.29	
22 Phenol	94	6.128	6.128	0.0	43	580081	9.58	
23 Aniline	93	6.118	6.118	0.0	93	666828	9.16	
24 Bis(2-chloroethyl)ether	93	6.223	6.223	0.0	99	424772	8.91	
25 2-Chlorophenol	128	6.289	6.289	0.0	97	478961	9.30	
26 1,3-Dichlorobenzene	146	6.508	6.508	0.0	97	536128	8.40	
27 1,4-Dichlorobenzene	146	6.622	6.622	0.0	82	554444	8.69	
28 Benzyl alcohol	108	6.841	6.841	0.0	65	190637	9.84	M
29 1,2-Dichlorobenzene	146	6.841	6.841	0.0	84	506507	8.52	
32 2,2'-oxybis[1-chloropropane]	45	7.036	7.036	0.0	71	635402	8.20	M
31 2-Methylphenol	108	7.027	7.027	0.0	74	410725	9.50	
33 Acetophenone	105	7.217	7.217	0.0	90	686795	9.31	
34 N-Nitrosodi-n-propylamine	70	7.222	7.222	0.0	93	346863	9.37	
36 4-Methylphenol	108	7.274	7.274	0.0	80	422690	9.66	

Jr 2/21/13

$RRF_{Naphthalene} = \frac{1429840}{779062} \times \frac{5.0}{8.0} = 1.147$ OK

$S.D = \frac{1.147 - 1.108}{1.108} = 3.5\%$ OK

CCAL - SVOC

Report Date: 21-Dec-2012 10:40:05 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3222.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
37 Hexachloroethane	117	7.336	7.336	0.0	93	225662	8.92	
38 Nitrobenzene	77	7.464	7.464	0.0	75	533709	8.80	
40 Isophorone	82	7.826	7.826	0.0	76	877673	8.80	
41 2-Nitrophenol	139	7.940	7.940	0.0	87	255493	9.26	
43 2,4-Dimethylphenol	107	8.054	8.054	0.0	86	428286	8.23	
45 Bis(2-chloroethoxy)methane	93	8.173	8.173	0.0	98	507081	8.58	
44 Benzoic acid	105	8.235	8.235	0.0	1	219069	8.22	
47 2,4-Dichlorophenol	162	8.325	8.325	0.0	83	377941	8.92	
48 1,2,4-Trichlorobenzene	180	8.410	8.410	0.0	98	443999	8.53	
49 Naphthalene	128	8.520	8.520	0.0	93	1429840	8.29	
51 4-Chloroaniline	127	8.648	8.648	0.0	87	574574	9.20	
52 Hexachlorobutadiene	225	8.715	8.715	0.0	85	241947	8.50	
54 Caprolactam	113	9.186	9.186	0.0	79	148714	9.65	
55 4-Chloro-3-methylphenol	107	9.438	9.438	0.0	94	445268	9.52	
56 2-Methylnaphthalene	142	9.561	9.561	0.0	79	989231	8.18	
57 1-Methylnaphthalene	142	9.704	9.704	0.0	94	914364	8.21	
58 Hexachlorocyclopentadiene	237	9.794	9.794	0.0	82	144329	7.73	
59 1,2,4,5-Tetrachlorobenzene	216	9.813	9.813	0.0	87	412227	8.61	
60 2,4,6-Trichlorophenol	196	10.018	10.018	0.0	96	256610	8.70	
61 2,4,5-Trichlorophenol	196	10.108	10.108	0.0	94	254176	8.91	
62 1,1'-Biphenyl	154	10.265	10.265	0.0	99	1231368	8.34	
63 2-Chloronaphthalene	162	10.313	10.313	0.0	95	888350	7.76	
64 Phenyl ether	170	10.427	10.427	0.0	90	668722	8.33	
65 2-Nitroaniline	65	10.484	10.484	0.0	81	317110	9.38	
66 1,4-Dinitrobenzene	75	10.712	10.712	0.0	87	200294	0	
67 Dimethyl phthalate	163	10.764	10.764	0.0	94	1126578	8.53	
68 2,6-Dinitrotoluene	165	10.850	10.850	0.0	89	546094	9.12	
69 Acenaphthylene	152	10.898	10.898	0.0	90	1519652	8.51	
70 3-Nitroaniline	138	11.116	11.116	0.0	91	266658	8.96	
71 Acenaphthene	153	11.154	11.154	0.0	90	966426	7.77	
72 2,4-Dinitrophenol	184	11.288	11.288	0.0	89	232264	18.5	
73 Dibenzofuran	168	11.421	11.421	0.0	98	1334149	8.79	
74 2,4-Dinitrotoluene	165	11.459	11.459	0.0	98	350964	9.18	
75 4-Nitrophenol	109	11.492	11.492	0.0	51	435844	17.1	M
76 2,3,4,6-Tetrachlorophenol	232	11.640	11.640	0.0	87	199822	8.71	
78 Diethyl phthalate	149	11.811	11.811	0.0	92	1239655	8.57	
79 Fluorene	166	11.920	11.920	0.0	81	1138188	8.20	
80 4-Chlorophenyl phenyl ether	204	11.939	11.939	0.0	89	510890	8.31	
81 4-Nitroaniline	138	12.025	12.025	0.0	82	273390	8.33	
82 4,6-Dinitro-2-methylphenol	198	12.048	12.048	0.0	60	389796	17.7	
84 Diphenylamine	169	12.115	12.115	0.0	99	1791651	8.56	
83 N-Nitrosodiphenylamine	169	12.115	12.115	0.0	99	1791651	8.57	
16 1,2-Diphenylhydrazine	77	12.153	12.153	0.0	96	1279530	9.47	
85 Azobenzene	77	12.153	12.153	0.0	95	1279530	9.49	
86 Benzophenone	105	12.177	12.177	0.0	97	975750	8.04	
89 4-Bromophenyl phenyl ether	248	12.581	12.581	0.0	84	280034	8.31	
91 Hexachlorobenzene	284	12.643	12.643	0.0	76	279753	7.88	
92 Simazine	201	12.795	12.795	0.0	81	166399	0	
93 Atrazine	200	12.833	12.833	0.0	88	626140	16.3	
95 Pentachloronitrobenzene	237	12.909	12.909	0.0	84	152671	8.07	
94 Pentachlorophenol	266	12.914	12.914	0.0	76	294593	17.0	
97 Phenanthrene	178	13.142	13.142	0.0	95	1606016	8.01	

JR 2/21/13

RRF = 966426 / Acenaphthene 510619 × 5.0/8.0 = 1.183 OK
%D = (1.183 − 1.218)/1.218 = −2.9% OK

RRF = 1606016 / Phenanthrene 898941 × 5.0/8.0 = 1.1166 OK
%D = (1.117 − 1.115)/1.115 = 0.14 OK (0.2)

CCAL - SVOC

Report Date: 21-Dec-2012 10:40:05 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3222.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
98 Anthracene	178	13.204	13.204	0.0	95	1639621	8.03	
99 Carbazole	167	13.413	13.413	0.0	98	1539043	8.13	
101 Alachlor	160	13.561	13.561	0.0	91	329227	0	
102 Di-n-butyl phthalate	149	13.799	13.799	0.0	96	1922516	8.77	
104 Fluoranthene	202	14.422	14.422	0.0	97	1576308	7.95	
105 Benzidine	184	14.593	14.593	0.0	99	596993	7.69	
106 Pyrene	202	14.645	14.645	0.0	98	1647920	8.75	
107 Famphur	218	15.201	15.201	0.0	83	652654	0	
108 Butyl benzyl phthalate	149	15.244	15.244	0.0	94	935660	8.99	
110 Bis(2-ethylhexyl) phthalate	149	15.739	15.739	0.0	95	1235050	8.62	
109 3,3'-Dichlorobenzidine	252	15.739	15.739	0.0	71	572808	9.07	
111 Benzo[a]anthracene	228	15.753	15.753	0.0	98	1366438	9.03	
112 Chrysene	228	15.791	15.791	0.0	91	1266268	7.37	
113 Di-n-octyl phthalate	149	16.281	16.281	0.0	97	1967301	8.71	
114 Benzo[b]fluoranthene	252	16.695	16.695	0.0	94	1436598	8.74	
115 Benzo[k]fluoranthene	252	16.718	16.718	0.0	98	1406611	8.31	
116 Benzo[a]pyrene	252	17.004	17.004	0.0	71	1265973	7.97	
118 Dibenz(a,h)anthracene	278	18.155	18.155	0.0	57	1234279	8.58	
117 Indeno[1,2,3-cd]pyrene	276	18.155	18.155	0.0	95	1433195	8.45	
119 Benzo[g,h,i]perylene	276	18.473	18.473	0.0	93	1157785	8.18	
S 121 3-Methylphenol	1		0.000					

QC Flag Legend

Review Flags
M - Manually Integrated

$$RRF_{Chrysene} = \frac{1266268}{702599} \times \frac{5.0}{8.0} = 1.126 \quad \underline{OK}$$

$$\%D = \frac{1.126 - 1.222}{1.222} = -7.86 \quad \underline{OK}$$

$$RRF_{Indeno(1,2,3-cd)pyrene} = \frac{1433195}{707467} \times \frac{5.0}{8.0} = 1.266 \quad \underline{OK}$$

$$\%D = \frac{1.266 - 1.198}{1.198} = 5.78 \quad \underline{OK}$$

Jr
2/21/13

Method Blank - SVOC

Report Date: 09-Mar-2013 09:29:36 Chrom Revision: 2.0 01-Feb-2013 10:03:10

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121220-17736.b\X3202.D		
Lims ID:	MB 480-96561/1-A	Client ID:	
Inject. Date:	20-Dec-2012 15:17:30	Dil. Factor:	1.0000
Sample Type:	MB		
Sample ID:	480-0017736-012		
Misc. Info.:			
Operator:	ANM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	14
Lims Batch ID:	96803	Lims Sample ID:	12
Detector:	MS SCAN		

Conc Phenol-d5 = $\frac{74732}{175457} \times \frac{5.0}{1.381} = 1.54$ OK

%r = $\frac{1.54}{2} = 77\%$ OK

Method:	\\Bufchrom\ChromData\HP5973X\20121220-17736.b\X-8270LL.m		
Last Update:	09-Mar-2013 09:29:35	Calib Date:	18-Dec-2012 14:44:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3139.D		
Limit Group:	MB - 8270RCP_MCP ICAL		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Process Host:	XAWRK034		

First Level Reviewer: mckernar Date: 20-Dec-2012 16:03:48

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.556	6.570	-0.014	81	175457	5.00	
* 2 Naphthalene-d8	136	8.448	8.439	0.009	96	633704	5.00	
* 3 Acenaphthene-d10	164	11.097	11.064	0.033	90	352883	5.00	
* 4 Phenanthrene-d10	188	13.114	13.080	0.034	95	503443	5.00	M
* 5 Chrysene-d12	240	15.753	15.734	0.019	97	437519	5.00	
* 6 Perylene-d12	264	17.037	17.013	0.024	97	487766	5.00	
$ 7 2-Fluorophenol	112	4.687	4.682	0.005	1	64800	1.63 ✓	
$ 8 Phenol-d5	99	6.109	6.090	0.019	86	74732	1.54 ✓	M
$ 9 Nitrobenzene-d5	82	7.402	7.393	0.009	75	97817	2.06	M
$ 10 2-Fluorobiphenyl	172	10.113	10.075	0.038	87	170367	1.92	
$ 11 2,4,6-Tribromophenol	330	12.291	12.229	0.062	0	16738	1.81	M
$ 12 p-Terphenyl-d14	244	14.778	14.759	0.019	92	154395	1.83	
15 4-Chloro-3-nitro-alpha,alpha,alp	1		0.000					
13 4-tert-Octylphenol	1		0.000					
14 Alpha-Terpineol	59		0.000					
17 1,2,3-Trimethylbenzene	1		0.000					
18 1,4-Dioxane	88		2.433					
19 N-Nitrosodimethylamine	42		2.766					
20 Pyridine	52		2.837					
21 Benzaldehyde	77		5.938					
23 Aniline	93		6.104					
22 Phenol	94		6.109					9
24 Bis(2-chloroethyl)ether	93		6.204					1
25 2-Chlorophenol	128		6.270					19
26 1,3-Dichlorobenzene	146		6.484					9
27 1,4-Dichlorobenzene	146		6.594					9
30 Pentachlorophenol_T	266		6.782					
29 1,2-Dichlorobenzene	146		6.813					9
28 Benzyl alcohol	108		6.813					
31 2-Methylphenol	108		6.993					

2-Fp Conc = $\frac{64800}{175457} \times \frac{5.0}{1.135} = 1.627$ OK

%r = $\frac{1.627}{2} = 81$ OK

JR 3/13/13

LCS - SVOC

Report Date: 09-Mar-2013 09:29:37 Chrom Revision: 2.0 01-Feb-2013 10:03:10

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121220-17736.b\X3203.D		
Lims ID:	LCS 480-96561/2-A	Client ID:	
Inject. Date:	20-Dec-2012 15:42:30	Dil. Factor:	1.0000
Sample Type:	LCS		
Sample ID:	480-0017736-013		
Misc. Info.:			
Operator:	ANM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	15
Lims Batch ID:	96803	Lims Sample ID:	13
Detector:	MS SCAN		

Conc Phenol-d5 = 98525 / 208342 x 5.0 / 1.381 = 1.712 OK

%R = 1.712 / 2 = 85.6%

Method:	\\Bufchrom\ChromData\HP5973X\20121220-17736.b\X-8270LL.m		
Last Update:	09-Mar-2013 09:29:35	Calib Date:	18-Dec-2012 14:44:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3139.D		
Limit Group:	MB - 8270RCP_MCP ICAL		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Process Host:	XAWRK034		

First Level Reviewer: mckernar Date: 20-Dec-2012 16:25:25

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.551	6.570	-0.019	83	208342	5.00	
* 2 Naphthalene-d8	136	8.448	8.439	0.009	96	783539	5.00	
* 3 Acenaphthene-d10	164	11.092	11.064	0.028	81	465037	5.00	
* 4 Phenanthrene-d10	188	13.109	13.080	0.029	96	656111	5.00	
* 5 Chrysene-d12	240	15.748	15.734	0.014	94	505522	5.00	
* 6 Perylene-d12	264	17.027	17.013	0.014	96	573004	5.00	
$ 7 2-Fluorophenol	112	4.677	4.682	-0.005	1	72910	1.54	
$ 8 Phenol-d5	99	6.080	6.090	-0.010	53	98525	1.71 ✓	
$ 9 Nitrobenzene-d5	82	7.383	7.393	-0.010	82	101577	1.73	
$ 10 2-Fluorobiphenyl	172	10.103	10.075	0.028	94	226772	1.94	
$ 11 2,4,6-Tribromophenol	330	12.262	12.229	0.033	51	20190	1.67	
$ 12 p-Terphenyl-d14	244	14.783	14.759	0.024	93	176596	1.81	
19 N-Nitrosodimethylamine	42	2.794	2.766	0.028	72	217127	5.70	
20 Pyridine	52	2.865	2.837	0.028	73	178879	4.63	
21 Benzaldehyde	77	5.918	5.938	-0.020	89	293463	7.19	
23 Aniline	93	6.085	6.104	-0.019	97	517791	6.79	
22 Phenol	94	6.099	6.109	-0.010	47	447892	7.06 ✓	M
24 Bis(2-chloroethyl)ether	93	6.180	6.204	-0.024	98	330320	6.61	
25 2-Chlorophenol	128	6.251	6.270	-0.019	97	384922	7.13	
26 1,3-Dichlorobenzene	146	6.461	6.484	-0.024	97	394452	5.89	
27 1,4-Dichlorobenzene	146	6.575	6.594	-0.019	69	419608	6.28	
29 1,2-Dichlorobenzene	146	6.793	6.813	-0.020	83	384587	6.17	
28 Benzyl alcohol	108	6.798	6.813	-0.015	58	95451	5.31	M
31 2-Methylphenol	108	6.979	6.993	-0.014	75	356316	7.87	
32 2,2'-oxybis[1-chloropropane]	45	6.974	6.998	-0.024	73	476007	5.86	
33 Acetophenone	105	7.164	7.174	-0.010	98	1171425	15.2	
34 N-Nitrosodi-n-propylamine	70	7.174	7.183	-0.009	83	280266	7.22	
36 4-Methylphenol	108	7.221	7.231	-0.010	79	729826	15.9 ✓	
37 Hexachloroethane	117	7.288	7.298	-0.010	95	168593	6.34	
38 Nitrobenzene	77	7.412	7.421	-0.009	83	428476	7.03	

Conc 4-Methylphenol = 729826 / 208342 x 5.0 / 1.101 = 15.908 OK

Conc Phenol = 447892 / 208342 x 5.0 / 1.523 = 7.06 OK

JR 3/13/13

LCS-SVOC

Report Date: 09-Mar-2013 09:29:37 Chrom Revision: 2.0 01-Feb-2013 10:03:10
Data File: \\Bufchrom\ChromData\HP5973X\20121220-17736.b\X3203.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
40 Isophorone	82	7.778	7.778	0.0	74	685472	6.83	
41 2-Nitrophenol	139	7.892	7.892	0.0	86	195301	7.04	
43 2,4-Dimethylphenol	107	8.006	8.001	0.005	86	380088	7.26	M
42 o,o',o"-Triethylphosphorothioat	198	8.087	8.055	0.032	89	213175	0	
45 Bis(2-chloroethoxy)methane	93	8.125	8.125	0.0	98	421500	7.10	
44 Benzoic acid	105	8.192	8.177	0.015	1	288225	10.2	M
47 2,4-Dichlorophenol	162	8.287	8.277	0.010	82	292701	6.87	
48 1,2,4-Trichlorobenzene	180	8.372	8.363	0.009	98	331702	6.33	
49 Naphthalene	128	8.477	8.472	0.005	93	1113316	6.41 ✓	
51 4-Chloroaniline	127	8.610	8.596	0.014	96	360757	5.74	
52 Hexachlorobutadiene	225	8.672	8.662	0.010	81	175269	6.13	
54 Caprolactam	113	9.152	9.129	0.023	84	108399	6.99	
55 4-Chloro-3-methylphenol	107	9.414	9.385	0.029	72	343127	7.29	
56 2-Methylnaphthalene	142	9.533	9.509	0.024	77	745588	6.13	
57 1-Methylnaphthalene	142	9.675	9.656	0.019	88	1703488	15.2	
58 Hexachlorocyclopentadiene	237	9.766	9.742	0.024	66	95162	5.79	
59 1,2,4,5-Tetrachlorobenzene	216	9.789	9.761	0.028	91	739552	17.0	
60 2,4,6-Trichlorophenol	196	9.999	9.970	0.029	94	206559	7.69	
61 2,4,5-Trichlorophenol	196	10.099	10.056	0.043	90	193506	7.45	
62 1,1'-Biphenyl	154	10.246	10.218	0.028	98	1110318	8.26	
63 2-Chloronaphthalene	162	10.265	10.265	0.0	94	699139	6.63	
64 Phenyl ether	170	10.412	10.384	0.028	90	719465	9.84	
65 2-Nitroaniline	65	10.469	10.436	0.033	80	236016	7.66	
66 1,4-Dinitrobenzene	75	10.698	10.665	0.033	82	144294	0	
67 Dimethyl phthalate	163	10.750	10.722	0.028	94	868780	7.22	
68 2,6-Dinitrotoluene	165	10.836	10.807	0.029	85	202889	3.72	
69 Acenaphthylene	152	10.883	10.850	0.033	88	1208682	7.43	
70 3-Nitroaniline	138	11.111	11.069	0.042	75	142866	5.27	
71 Acenaphthene	153	11.145	11.112	0.033	90	737088	6.51	
72 2,4-Dinitrophenol	184	11.311	11.240	0.071	73	70879	7.60	M
73 Dibenzofuran	168	11.411	11.378	0.033	97	1054293	7.63	
74 2,4-Dinitrotoluene	165	11.454	11.416	0.038	95	247968	7.12	
75 4-Nitrophenol	109	11.563	11.454	0.109	28	168482	7.24	M
76 2,3,4,6-Tetrachlorophenol	232	11.635	11.597	0.038	85	310847	14.9	
78 Diethyl phthalate	149	11.806	11.777	0.029	92	953293	7.23	
79 Fluorene	166	11.915	11.882	0.033	81	862270	6.82	
80 4-Chlorophenyl phenyl ether	204	11.929	11.901	0.028	89	401872	7.18	
81 4-Nitroaniline	138	12.025	11.982	0.043	82	149885	5.18	
82 4,6-Dinitro-2-methylphenol	198	12.053	12.010	0.043	56	100613	5.72	
83 N-Nitrosodiphenylamine	169	12.105	12.077	0.028	97	662001	4.34	
16 1,2-Diphenylhydrazine	77	12.148	12.120	0.028	95	2110096	21.4	E
85 Azobenzene	77	12.148	12.120	0.028	94	2110096	21.4	E
86 Benzophenone	105	12.167	12.144	0.023	92	980971	8.87	
87 Sulfotepp	322	12.343	12.297	0.046	77	163376	0	
88 Phorate	75	12.495	12.454	0.041	87	560766	0	
89 4-Bromophenyl phenyl ether	248	12.576	12.548	0.028	85	197553	8.03	
91 Hexachlorobenzene	284	12.638	12.610	0.028	77	200679	7.75	
90 Dimethoate	87	12.728	12.668	0.060	83	304877	0	
93 Atrazine	200	12.819	12.800	0.019	85	230022	6.58	
94 Pentachlorophenol	266	12.919	12.885	0.034	66	82098	7.02	
97 Phenanthrene	178	13.133	13.109	0.024	90	1116900	7.64	
96 Disulfoton	88	13.133	13.120	0.013	70	499421	0	

Conc Naphthalene $= \frac{1113316}{783529} \times \frac{5.0}{1.108} = 6.41$ OK

gr 3/13/13

03/12/2013

Sample - SVOC

Report Date: 01-Mar-2013 16:46:19 Chrom Revision: 2.0 01-Feb-2013 10:03:10

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3229.D		
Lims ID:	480-30406-C-3-A	Client ID:	OC-SD-SD-501-XXX
Inject. Date:	21-Dec-2012 13:11:30	Dil. Factor:	10.0000
Sample Type:	Client		
Sample ID:	480-0017772-009		
Misc. Info.:			
Operator:	ANM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	10
Lims Batch ID:	97046	Lims Sample ID:	9
Detector:	MS SCAN		

Conc Terphenyl-d_{14} $= \frac{10041}{521561} \times \frac{5.0}{.9641} = .0998$ OK

Sor $= \frac{.0998 \times 10}{2} = 50$ OK

Method:	\\Bufchrom\ChromData\HP5973X\20121221-17772.b\X-8270LL.m		
Last Update:	01-Mar-2013 16:46:14	Calib Date:	18-Dec-2012 14:44:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3139.D		
Limit Group:	MB - 8270RCP_MCP ICAL		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Process Host:	XAWRK018		

First Level Reviewer: mckernar Date: 21-Dec-2012 13:47:17

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.551	6.599	-0.048	82	142880	5.00	
* 2 Naphthalene-d8	136	8.458	8.491	-0.033	98	598492	5.00	
* 3 Acenaphthene-d10	164	11.107	11.107	0.0	90	352142	5.00	
* 4 Phenanthrene-d10	188	13.123	13.114	0.009	96	598673	5.00	
* 5 Chrysene-d12	240	15.767	15.767	0.0	94	521561	5.00	
* 6 Perylene-d12	264	17.056	17.056	0.0	98	541623	5.00	
$ 7 2-Fluorophenol	112		4.677					9
$ 8 Phenol-d5	99		6.109					9
$ 9 Nitrobenzene-d5	82		7.431					9
$ 10 2-Fluorobiphenyl	172		10.122					9
$ 11 2,4,6-Tribromophenol	330		12.262					9
$ 12 p-Terphenyl-d14	244	14.797	14.792	0.005	78	10041	0.0998 ✓	
19 N-Nitrosodimethylamine	42		2.785					
21 Benzaldehyde	77	5.909	5.952	-0.043	87	84972	3.03 ✓	
23 Aniline	93		6.118					
22 Phenol	94	6.104	6.128	-0.024	50	160373	3.68 ✓	
24 Bis(2-chloroethyl)ether	93		6.223					
25 2-Chlorophenol	128		6.289					
26 1,3-Dichlorobenzene	146		6.508					
27 1,4-Dichlorobenzene	146		6.622					
28 Benzyl alcohol	108		6.841					
29 1,2-Dichlorobenzene	146		6.841					
31 2-Methylphenol	108		7.027					9
32 2,2'-oxybis[1-chloropropane]	45		7.036					
35 DFTPP								
33 Acetophenone	105	7.193	7.217	-0.024	60	17564	0.3315	M
34 N-Nitrosodi-n-propylamine	70		7.222					149
36 4-Methylphenol	108	7.226	7.274	-0.048	82	296603	9.43	
37 Hexachloroethane	117		7.336					19
38 Nitrobenzene	77		7.464					

Conc Benzaldehyde $= 3.03 \frac{\mu g}{mL} \times \frac{1.0\,mL}{.0306\,kg} \times 10^1 \times \frac{1}{.715}$

$= 1385 \frac{\mu g}{kg}$ OK (1400)

Conc Phenol $= 3.68 \frac{\mu g}{mL} \times \frac{1.0\,mL}{.0306\,kg} \times 10 \times \frac{1}{.715} = 1682 \frac{\mu g}{kg}$ OK (1700)

Conc Benzaldehyde $= \frac{84972}{142880} \times \frac{5.0}{0.98} = 3.03$ OK

Conc Phenol $= \frac{160373}{142880} \times \frac{5.0}{1.523} = 3.68$ OK

3/13/13

Sample - SVOC

Report Date: 01-Mar-2013 16:46:19 Chrom Revision: 2.0 01-Feb-2013 10:03:10
Data File: \\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3229.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
40 Isophorone	82		7.826					
41 2-Nitrophenol	139		7.940					
43 2,4-Dimethylphenol	107		8.054					
45 Bis(2-chloroethoxy)methane	93		8.173					14
44 Benzoic acid	105		8.235					
47 2,4-Dichlorophenol	162		8.325					9
48 1,2,4-Trichlorobenzene	180		8.410					
49 Naphthalene	128		8.520					9
51 4-Chloroaniline	127		8.648					149
52 Hexachlorobutadiene	225		8.715					
54 Caprolactam	113		9.186					
55 4-Chloro-3-methylphenol	107		9.438					1
56 2-Methylnaphthalene	142		9.561					
57 1-Methylnaphthalene	142		9.704					
58 Hexachlorocyclopentadiene	237		9.794					
59 1,2,4,5-Tetrachlorobenzene	216		9.813					
60 2,4,6-Trichlorophenol	196		10.018					
61 2,4,5-Trichlorophenol	196		10.108					
62 1,1'-Biphenyl	154		10.265					
63 2-Chloronaphthalene	162		10.313					9
64 Phenyl ether	170		10.427					
65 2-Nitroaniline	65		10.484					
67 Dimethyl phthalate	163		10.764					9
68 2,6-Dinitrotoluene	165		10.850					
69 Acenaphthylene	152		10.898					9
70 3-Nitroaniline	138		11.116					
71 Acenaphthene	153	11.159	11.154	0.005	0	4605	0.0537	M
72 2,4-Dinitrophenol	184		11.288					
73 Dibenzofuran	168		11.421					
74 2,4-Dinitrotoluene	165		11.459					
75 4-Nitrophenol	109		11.492					
76 2,3,4,6-Tetrachlorophenol	232		11.640					
78 Diethyl phthalate	149		11.811					
79 Fluorene	166		11.920					9
80 4-Chlorophenyl phenyl ether	204		11.939					
81 4-Nitroaniline	138		12.025					
82 4,6-Dinitro-2-methylphenol	198		12.048					
83 N-Nitrosodiphenylamine	169		12.115					
85 Azobenzene	77		12.153					
86 Benzophenone	105		12.177					
89 4-Bromophenyl phenyl ether	248		12.581					
91 Hexachlorobenzene	284		12.643					9
93 Atrazine	200		12.833					9
94 Pentachlorophenol	266		12.914					
97 Phenanthrene	178	13.152	13.142	0.010	50	37983	0.2846	
98 Anthracene	178	13.228	13.204	0.024	27	9150	0.0673	
99 Carbazole	167	13.432	13.413	0.019	65	5440	0.0432	
102 Di-n-butyl phthalate	149		13.799					9
104 Fluoranthene	202	14.436	14.422	0.014	90	60555	0.4583	
106 Pyrene	202	14.659	14.645	0.014	93	55997	0.4007	
108 Butyl benzyl phthalate	149		15.244					
110 Bis(2-ethylhexyl) phthalate	149	15.734	15.739	-0.005	77	28361	0.2666	

Conc 4-methyl phenol $= \frac{296603}{142880} \times \frac{5.0}{1.101} \times \frac{1.0\,mL}{.0306\,kg} \times 10 \times \frac{1}{.715} = 4309\ \frac{ug}{kg}$ OK

(4305)

Conc Fluoranthene $= \frac{60555}{598673} \times \frac{5.0}{1.104} \times \frac{1.0\,mL}{.0306\,kg} \times 10 \times \frac{1}{.715} = 209\ \frac{ug}{kg}$ OK

(210)

3/13/13

Sample - SW02

Report Date: 01-Mar-2013 16:46:19 Chrom Revision: 2.0 01-Feb-2013 10:03:10
Data File: \\Bufchrom\ChromData\HP5973X\20121221-17772.b\X3229.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
109 3,3'-Dichlorobenzidine	252		15.739					
111 Benzo[a]anthracene	228		15.753					
112 Chrysene	228	15.796	15.791	0.005	11	24886	0.1952	
113 Di-n-octyl phthalate	149		16.281					9
114 Benzo[b]fluoranthene	252	16.704	16.695	0.009	56	35384	0.2813	
115 Benzo[k]fluoranthene	252	16.728	16.718	0.010	28	19930	0.1538	
116 Benzo[a]pyrene	252		17.004					
117 Indeno[1,2,3-cd]pyrene	276		18.155					
118 Dibenz(a,h)anthracene	278		18.155					
119 Benzo[g,h,i]perylene	276		18.473					
S 120 3 & 4 Methylphenol	108		0.000					

QC Flag Legend

Processing Flags
1 - Missing Peaks
4 - Failed Signal Ratio Test
9 - Failed A Reference Spectral Test

Review Flags
M - Manually Integrated

$$\text{Conc}_{\text{Acetophenone}} = \frac{17564}{142850} \times \frac{5.0}{1.854}\ \frac{ug}{mL} \times \frac{1.0\ mL}{.0306\ kg} \times 10 \times \frac{1}{.715} = 151\ \frac{ug}{kg}\ (150)$$

OK

JN 3/13/13

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for

OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifiers: Region I Guidelines (11/08)

TIER I / II / III (circle one)

SITE: **Olin Chemical** Project #: 61071300 16.01.10 SDG #: 480-30406-1

LAB #: 480-30406-1

Sample IDs: Attached tracking sheet or sample listing.

OC-SD-SD-503-XXX OC-SD-SD-501-XXX

OC-SD-SD-504-XXX OC-SD-SD-502-XXX

This checklist is designed to be used with the USEPA Data Validation Guidelines Part IV (November 2008). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO	NA		
Data completeness				
☑	☐	☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑	☐	☐	Data summaries match EDD	
Holding Times and Preservation				
☑	☐	☐	Hold times met (6 months, 28 days Hg)	
☑	☐	☐	Preserved (waters HNO_3) (sediments)	
Calibration				
☐	☐	☑	ICP/MS Instrument Tune.	Verify that tuning meets mass, resolution, and RSD method criteria.
☑	☐	☐	Appropriate number of standards used to establish calibration curve.	ICP: at least one blank and one standard Hg: at least one blank and four standards
☑	☐	☐	Correlation coefficient > 0.995 for Hg	Correlation coefficient criteria applicable to all analyses except ICP-AES.
☑	☐	☐	Calibrated daily.	
☑	☐	☐	ICV/CCV %R within acceptance range.	90-110% for ICP-AES/MS, 80-120% for Hg. See additional qualification actions in the Region 1 guidelines.
☑	☐	☐	CCVs analyzed at the proper frequency.	Every 10 samples or every 2 hrs.
☐	☑	☐	QL Standard within limits Ag 52% J (UJ) results < 2RL Sn 58% J (UJ) results < 2RL all	70-130% for QL Standard. If out low, (J) detects less then 2X QL standard and (UJ) non-detects. See additional validation actions in the Region I guidelines.

INORGANICS
TAL METALS (including mercury)
REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER I / II / III (circle one) 480-30406-1

Blanks Method: ☑ ☐ ☐ Method blank was prepared with each batch of samples or with a maximum of 20 samples ☑ ☐ ☐ Results >MDL ☐ ☐ ☑ Absolute value negative MB results > 5x MDL All OK ☐ ☐ ☑ For ICP/MS verify IS responses meet method criteria	Evaluate all blanks for contamination. Highest contaminant level used for action level. 5X the highest blank contamination is the action level. Zn .299 mg/kg >; no quals needed Ca 8.95 >; no quals needed Fe 3.90 >; no quals needed Mn .0833 >; no quals needed
Calibration Blanks: ☑ ☐ ☐ ICB/CCB results > IDL ☐ ☐ ☑ Absolute value of negative ICB/CCB results > 5x MDL All OK ☑ ☐ ☐ CCB analyzed every 10 samples or 2 hrs. Equipment/Rinseate Blanks: ☐ ☐ ☑ Results >MDL ☐ ☐ ☑ Absolute value of negative ICB/CCB results > 5x MDL	Cu .00216 mg/L × .05 L / .0005 kg = 0.216 mg/kg All samples > 5x action level ∴ no quals needed
Interference Check Sample ☑ ☐ ☐ ICS analyzed at proper frequency ☐ ☑ ☐ Interference present in sample at > 50% concentration in ICS ☑ ☐ ☐ ICS AB %R 80%-120% ICP-MS Internal Standard Intensities ☐ ☐ ☑ Internal standard relative intensities reported by the laboratory ☐ ☐ ☑ Internal standard relative intensities are within 60 – 125 %	An ICS must be run at the beginning and end of run or every 8 hours. If interferences (Al, Ca, Fe, Mg) are not > 50% ICS concentration in sample, do not apply. Qualify data based on Region 1 guideline
Matrix Spikes ☐ ☑ ☐ All compounds are within %R of 75-125% excluding results exceeding the spike concentration by ≥4x ☑ ☐ ☐ Were post-digestion spikes reported for unacceptable pre-digestion spike recoveries ☐ ☑ ☐ Was a field blank used for spike analysis	Hg: SD-503 MS/MSD: OK ICP: SD-502 MS/MSD: Al 140 J+ all Se 73 J/UJ Fe 71 J/UJ Post-digestion spikes %R limits = 75% - 125% all

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER I / II / III (circle one) 480 - 30406-1

Laboratory Control Samples (LCS) ☑ ☐ ☐ Percent recoveries are within limits (waters and soil 80-120%) ☑ ☐ ☐ An LCS was analyzed for each matrix, batch of samples, or every 20 samples.	
Laboratory Duplicate Dup analyzed as MS/MSD; all RPDs < 35 ☐ ☑ ☐ Was a field blank used as the lab duplicate ☑ ☐ ☐ Is the RPD within water control limits of ±20% for sample values >5x RL(35% for soil) ☐ ☐ ☑ Is the control limit of ± RL met for sample values <5x RL (2x RL for soil) ☑ ☐ ☐ Was a duplicate analyzed for every matrix and every 20 samples or batch	
Field Duplicate ☐ ☐ ☑ For sample values >5x RL, the RPD control limit of ± 30% (50% for soil) was met ☐ ☐ ☑ For sample values <5x RL, the control limit of ±2x RL (4x RL for soil) was met	
Serial Dilution All OK (30406-4) ☐ ☑ ☐ Are any percent difference criteria > 15% (for samples with a concentration >50 times the IDL) ☐ ☐ ☑ Are results of the diluted samples > the original sample results	

Validator's Signature: Julie Niares

Date: 3/14/13

Reference:

MACTEC, Project Operation Plan Volume IIB, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. .April 2009.

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-503-XXX**

Lab Sample ID: 480-30406-1
Client Matrix: Solid

% Moisture: 36.1

Date Sampled: 12/17/2012 1430
Date Received: 12/17/2012 1850

6010 Metals (ICP)

Analysis Method:	6010	Analysis Batch:	480-96762	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-96586	Lab File ID:	I1121912A-10.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5654 g
Analysis Date:	12/19/2012 2136			Final Weight/Volume:	50 mL
Prep Date:	12/19/2012 1200				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		ND J	^	0.28	0.69
Arsenic		12		0.55	1.4
Barium		48		0.15	0.69
Beryllium		0.12	J	0.039	0.28
Cadmium		0.55		0.042	0.28
Chromium		50		0.28	0.69
Nickel		11		0.32	1.4
Thallium		ND		0.42	1.4
Vanadium		22		0.15	0.69
Lead		26		0.33	0.69
Selenium		ND J		0.55	0.69
Antimony		ND		0.55	0.69
Sodium		110	J	18	190
Potassium		1100		28	42
Calcium		4700	B	4.6	69
Iron		12000 J	B	1.5	14
Magnesium		2300		1.3	28
Copper		19		0.29	1.4
Aluminum		9100 J		6.1	14
Manganese		400	B	0.044	0.28
Cobalt		4.8		0.069	0.69

Analysis Method:	6010	Analysis Batch:	480-96876	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-96586	Lab File ID:	I2122012A-3.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5654 g
Analysis Date:	12/20/2012 1230			Final Weight/Volume:	50 mL
Prep Date:	12/19/2012 1200				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Zinc		55	B	0.21	3.5

Analysis Method:	6010	Analysis Batch:	480-104944	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-104616	Lab File ID:	I1022613A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5070 g
Analysis Date:	02/26/2013 1149			Final Weight/Volume:	50 mL
Prep Date:	02/25/2013 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Tin		2.2	J ^	0.66	3.1

7471A Mercury (CVAA)

3/14/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-504-XXX**

Lab Sample ID: 480-30406-2
Client Matrix: Solid
% Moisture: 43.7

Date Sampled: 12/17/2012 1500
Date Received: 12/17/2012 1850

6010 Metals (ICP)

Analysis Method:	6010	Analysis Batch:	480-96762	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-96586	Lab File ID:	I1121912A-10.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5611 g
Analysis Date:	12/19/2012 2138			Final Weight/Volume:	50 mL
Prep Date:	12/19/2012 1200				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		ND J	^	0.32	0.79
Arsenic		9.4		0.63	1.6
Barium		51		0.17	0.79
Beryllium		0.089	J	0.044	0.32
Cadmium		0.56		0.048	0.32
Chromium		33		0.32	0.79
Nickel		9.9		0.36	1.6
Thallium		ND		0.48	1.6
Vanadium		19		0.17	0.79
Lead		23		0.38	0.79
Selenium		ND J		0.63	0.79
Antimony		ND		0.63	0.79
Sodium		150	J	21	220
Potassium		740		32	48
Calcium		4800	B	5.2	79
Iron		11000 J	B	1.7	16
Magnesium		2000		1.5	32
Copper		25		0.33	1.6
Aluminum		7800 J		7.0	16
Manganese		440	B	0.051	0.32
Cobalt		4.5		0.079	0.79

Analysis Method:	6010	Analysis Batch:	480-96876	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-96586	Lab File ID:	I2122012A-3.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5611 g
Analysis Date:	12/20/2012 1233			Final Weight/Volume:	50 mL
Prep Date:	12/19/2012 1200				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Zinc		73	B	0.24	4.0

Analysis Method:	6010	Analysis Batch:	480-104944	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-104616	Lab File ID:	I1022613A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5212 g
Analysis Date:	02/26/2013 1151			Final Weight/Volume:	50 mL
Prep Date:	02/25/2013 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Tin		2.3	J ^	0.73	3.4

7471A Mercury (CVAA)

JM 3/14/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-501-XXX**

Lab Sample ID: 480-30406-3
Client Matrix: Solid
% Moisture: 28.5

Date Sampled: 12/17/2012 1215
Date Received: 12/17/2012 1850

6010 Metals (ICP)

Analysis Method:	6010	Analysis Batch:	480-96762	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-96586	Lab File ID:	I1121912A-10.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5123 g
Analysis Date:	12/19/2012 2140			Final Weight/Volume:	50 mL
Prep Date:	12/19/2012 1200				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		ND J	^	0.27	0.68
Arsenic		6.2		0.55	1.4
Barium		45		0.15	0.68
Beryllium		0.094	J	0.038	0.27
Cadmium		0.21	J	0.041	0.27
Chromium		19		0.27	0.68
Nickel		8.7		0.31	1.4
Thallium		ND		0.41	1.4
Vanadium		17		0.15	0.68
Lead		51		0.33	0.68
Selenium		0.70 J		0.55	0.68
Antimony		ND		0.55	0.68
Sodium		140	J	18	190
Potassium		790		27	41
Calcium		3900	B	4.5	68
Iron		9500 J	B	1.5	14
Magnesium		2000		1.3	27
Copper		21		0.29	1.4
Aluminum		6500 J		6.0	14
Manganese		590	B	0.044	0.27
Cobalt		4.0		0.068	0.68

Analysis Method:	6010	Analysis Batch:	480-96876	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-96586	Lab File ID:	I2122012A-3.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5123 g
Analysis Date:	12/20/2012 1235			Final Weight/Volume:	50 mL
Prep Date:	12/19/2012 1200				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Zinc		65	B	0.21	3.4

Analysis Method:	6010	Analysis Batch:	480-104944	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-104616	Lab File ID:	I1022613A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5042 g
Analysis Date:	02/26/2013 1153			Final Weight/Volume:	50 mL
Prep Date:	02/25/2013 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Tin		2.1	J ^	0.60	2.8

7471A Mercury (CVAA)

JW 3/14/13

Client: Olin Corporation

Job Number: 480-30406-1

Client Sample ID: **OC-SD-SD-502-XXX**

Lab Sample ID: 480-30406-4
Client Matrix: Solid
% Moisture: 30.6

Date Sampled: 12/17/2012 1245
Date Received: 12/17/2012 1850

6010 Metals (ICP)

Analysis Method:	6010	Analysis Batch:	480-96762	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-96586	Lab File ID:	I1121912A-10.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4979 g
Analysis Date:	12/19/2012 2143			Final Weight/Volume:	50 mL
Prep Date:	12/19/2012 1200				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		ND J	^	0.29	0.72
Arsenic		8.1		0.58	1.4
Barium		46		0.16	0.72
Beryllium		0.090	J	0.041	0.29
Cadmium		0.26	J	0.043	0.29
Chromium		27		0.29	0.72
Nickel		8.7		0.33	1.4
Thallium		ND		0.43	1.4
Vanadium		16		0.16	0.72
Lead		50		0.35	0.72
Selenium		ND J		0.58	0.72
Antimony		ND		0.58	0.72
Sodium		150	J	19	200
Potassium		730		29	43
Calcium		3800	B	4.8	72
Iron		9200 J	B	1.6	14
Magnesium		1800		1.3	29
Copper		21		0.30	1.4
Aluminum		6500 J		6.4	14
Manganese		440	B	0.046	0.29
Cobalt		3.9		0.072	0.72

Analysis Method:	6010	Analysis Batch:	480-96876	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-96586	Lab File ID:	I2122012A-3.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4979 g
Analysis Date:	12/20/2012 1237			Final Weight/Volume:	50 mL
Prep Date:	12/19/2012 1200				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Zinc		65	B	0.22	3.6

Analysis Method:	6010	Analysis Batch:	480-104944	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-104616	Lab File ID:	I1022613A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5118 g
Analysis Date:	02/26/2013 1156			Final Weight/Volume:	50 mL
Prep Date:	02/25/2013 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Tin		2.2	J ^	0.61	2.8

7471A Mercury (CVAA)

3/14/13

December Sediment

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION

STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date Tige Cunningham 3/5/13
Sr.

Lab Report # 480-30406-1
Project # 6107130016-10

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for **Sampling, Data Evaluation and Reporting Activities.**" MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

Ammonia pH TOC
Chloride
Sulfate ORP

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Check items received. **Yes** [✓] No [ ] N/A [ ] Comments:

☑ *Name of Laboratory* ☑ *Address* ☑ *Project ID* ☑ *Phone #* ☑ *Sample identification – Field and Laboratory*

Client Information: ☑ *Name* ☑ *Address* ☑ *Client Contact* *(IDs must be cross-referenced)*

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement ***Yes*** [✓] *No* [ ] *N/A* [ ] *Comments:*

Does the laboratory report include a completed Analytical Report Certification in the required format?

***ACTION**: If no, contact lab for submission of missing certification or certification with correct format.*

1.3 Laboratory Case Narrative: ***Yes*** [✓] *No* [ ] *N/A* [ ] *Comments:*

☑ *Narrative serves as an exception report for the project and method QA/QC performance.* ☐ *Narrative includes an explanation of each discrepancy on the Certification Statement.*

***ACTION**: If no, contact lab for submission of missing or illegible information.*

1.4 Chain of Custody (COC) copy present with all documentation completed? **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (*Cooler Receipt Form*): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

Yes [✓] No [ ] N/A [ ] Comments:

☑ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☑ Container type noted ☑ Condition observed ☑ pH verified (where applicable) ☑ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used?

Yes [✓] No [ ] N/A [ ] Comments:

Ammonia, ~~1 Liter polyethylene/H_2SO_4 to pH<2~~,cool to 4°C 8oz jar

Alkalinity – 1 500mL polyethylene/cool to 4°C

Chemical Oxygen Demand – 250 mL polyethylene/H_2SO_4 to pH<2,cool to 4°C

Chloride, pH, sulfate - 1 500mL polyethylene/cool to 4°C 8oz jar

Organic Carbon – 500 mL amber glass bottle/HCl or H_2SO_4 to pH<2,cool to 4°C 8oz jar

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C

TSS, TDS - 1 500mL polyethylene/cool to 4°C

pH

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage? **Yes** [✓] No [ ] N/A [ ] Comments:

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? Yes [ ] **No** [✓] N/A [ ] Comments:

1.6 Sample Results Section: *Was the following information supplied in the laboratory report for each sample?* **Yes** [✓] No [ ] N/A [ ] Comments:

[✓] Field ID and Lab ID [✓] Date and time collected [✓] Analyst Initials [✓] Dilution Factor [✓] % moisture or solids ~~N/A~~ [✓] Reporting limits
[ ] *Clean-up method* N/A [✓] Analysis method [✓] Preparation method [✓] Date of preparation/extraction/digestion clean-up and analysis, where applicable
[✓] Matrix [✓] Target analytes and concentrations [✓] Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch? **Yes** [✓] No [ ] N/A [ ] Comments:

[✓] Method blank results [✓] LCS recoveries [ ] MS/MSD recoveries and RPDs Not submitted [✓] Laboratory duplicate results (where applicable) For pH & ORP

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times Yes [ ] **No** [✓] N/A [ ] Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days Sulfide, TDS, TSS = 7 days pH = analyze immediately ↳ w/in 24 hrs Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method **Yes** [✓] No [ ] N/A [ ] Comments:

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

3.2 Are the practical quantitation limits the same as those specified by the ☐ SOW ☑ QAPP ☐ Lab? **Yes** [✓] No [ ] N/A [ ] Comments:

Note: *The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP*. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.*

Ammonia* ☐ = 0.1 mg/ L	Alkalinity**☐ = 1 mg/L	Bicarbonate Alkalinity** ☐ = 1 mg/L	Carbonate Alkalinity** ☐ = 1 mg/L
Nitrate Nitrogen as N* ☐ = .05 mg/L	Nitrite Nitrogen as N* ☐ = .01 mg/L	Chloride* ☐ = ~~1 mg/L~~ 20 mg/kg	Hardness *☐ = 2.64 mg/L
Spec. Cond.** ☐ 3 umhos/cm	Total Organic Carbon** ☑ = ~~1 mg/L~~ 1000 mg/kg		Sulfate (EPA 300.0)* ☐ = ~~2 mg/L~~ 40 mg/kg
COD:* Low – 20 mg/L	pH* ☐ < 2 to > 12	TDS* ☐ = 10 mg/L	TSS* ☐ = 5 mg/L

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If *dilutions were required, were dilution factors reported?* **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact the lab for submission.

4.0 **<u>Method Blanks</u>** **Yes** [✓] No [ ] N/A [ ] Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs). **Yes** [✓] No [ ] N/A [ ] Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following: Yes [ ] **No** [✓] N/A [ ] Comments:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 5 × blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits? Yes [ ] **No** [✓] N/A [ ] Comments:

LCS Limits:

Alkalinity** ☐ = 80-120% Bicarbonate Alkalinity** ☐ = 80-120% Carbonate Alkalinity** ☐ = 80-120% Specific Conductivity *☐ = 80-120%

Total Organic Carbon** ☑ = 80-120% TDS** ☐ = 80-120% Ammonia Nitrogen as N* ☑ = 80-120%

COD Low* ☐ = 80-120% Nitrate Nitrogen as N**☐ = 80-120%% Nitrite Nitrogen as N** ☐= 80-120%

Hardness* ☐ = 80-120% Chloride* ☑ = 80-120% Sulfate (EPA 300.0)* ☑ = 80-120% pH* ☑ = 80-120% TSS* NA

Other parameter(list) _____ %R = _____ ☐ Rec Limits= _____

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

Yes [__] No [✓] N/A [__] Comments:

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

Yes [__] No [__] N/A [✓] Comments:

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix? **Yes** [ ] No [✓] N/A [ ] Comments:

ACTION: If any matrix spike data is missing, call lab for resubmission.

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: $\%R_{SA} = \frac{(SSR-SR)}{} \times 100\%$ Where: SSR = Spiked sample result; SR = Sample result; SA = Spike added

MS/MSD Recovery Limits:

Alkalinity* = NA Bicarbonate Alkalinity* = NA Carbonate alkalinity* = NA Ammonia* (LACHAT) ☐ = 74-125%

Chloride** ☐= 75-125% Specific Conductivity * = NA Total Organic Carbon* = NA TDS** = NA

COD Low* ☐ = 75-125% Nitrate Nitrogen as N** ☐ = 75-125%

Nitrite Nitrogen as N** ☐ = 75-125% Hardness* ☐ = 75-125% Sulfate (EPA 300.0)* ☐ = 75-125% pH* = NA TSS* = NA

Other parameter(list) _____ % R = _____ ☐ Rec Limits = _____

* = Laboratory Limits ** = Olin QAPP Limits *(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)*

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: $RPD = \frac{S - D}{(S + D)/2} \times 100\%$ Where S = MS result, D = MSD result

MS/MSD RPD Limits:

Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia** (LACHAT) ☐ = 20%
Chloride**(SM 4500 Cl) ☐ = 20%	Specific Conductivity * = NA	Total Organic Carbon* = NA	TDS** = NA Total Organic Carbon* = NA
COD Low** ☐ = 20%	COD High** ☐ = 20%	Nitrate Nitrogen as N** ☐ 20%	Nitrite Nitrogen as N** ☐ = 20%
Hardness* = NA	Sulfate (EPA 300.0)* ☐ = 20%	pH* = NA	TSS* = NA

Other parameter(list) _____ RPD = _____ ☐ RPD limit = _____

Other parameter(list) _____ RPD = _____ ☐ RPD limit = _____

* = Laboratory Limits ** = Olin QAPP Limits

(*MADEP has not yet defined LCS recovery limits for wet chemistry analyses.*)

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20%? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

pH & ORP only

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist. **Yes** [ ] No [✓] N/A [ ] Comments:

8.2 Do any rinsate blanks have positive results? Yes [ ] **No** [ ] N/A [✓] Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

NOTE: *MADEP does not require the collection of rinsate blanks.*

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates. **Yes** [ ] No [✓] N/A [ ] Comments:

9.2 Were field duplicates collected per the required frequency? **Yes** [ ] No [ ] N/A [✓] Comments:

SOW ☐ QAPP ☐ *MADEP Option 1(1 per 20)* ☐ *MADEP Option 3 (1 per 10)* ☐

9.3 Was the RPD ≤ 50% for soils or ≤30% for waters? Calculate the RPD for all results and attach to this review. **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: RPD must be ≤50% for soil or ≤30% water. Qualify data (J) for both sample results if the RPD exceeds limit.

Was any of the data qualified? Yes [ ] **No** [✓] N/A [ ] Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

REFERENCES

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

STL-Westfield, 2002. "Olin – General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-30406-1

SDG No.:

Batch Number: 96652 Batch Start Date: 12/19/12 16:02 Batch Analyst: Doyle, Matthew

Batch Method: Moisture Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
480-30406-A-1	OC-SD-SD-503-XXX	Moisture	T	1	4.35 g	18.76 g	13.56 g		
480-30406-A-2	OC-SD-SD-504-XXX	Moisture	T	2	4.35 g	16.63 g	11.26 g		
480-30406-A-3	OC-SD-SD-501-XXX	Moisture	T	3	4.35 g	20.75 g	16.08 g		
480-30406-A-4	OC-SD-SD-502-XXX	Moisture	T	4	4.35 g	17.89 g	13.75 g		

Batch Notes	
Batch Comment	pp-fh-05-12 4.35
Date samples were placed in the oven	12/19/12
Time samples were place in the oven	1630

Basis	Basis Description
T	Total/NA

OC-SD-SD-503-XXY

18.76 − 4.35 = 14.41

13.56 − 4.35 = 9.21

$\frac{9.21}{14.41} = .639$

64% Solid

3/5/13

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

OLIN-WILMINGTON
CHEMIST REVIEW
STANDARD OPERATING PROCEDURE AND CHECKLIST
NDMA IN SOIL BY METHOD ~~8270 MODIFIED Low Level~~ 521 GC/CI/MS/MS

December Sed

Reviewer/Date Tige Cunningham 3/1/15
Sr. Review/Date
Lab Report # 480-30406-1
Project 6107130016-10

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Check items received. **Yes** [✓] No [ ] N/A [ ] Comments:

☑ *Name of Laboratory* ☑ *Address* ☑ *Project ID* ☑ *Phone #* ☑ *Sample identification – Field and Laboratory (IDs must be cross-referenced)*

Client Information: ☑ *Name* ☑ *Address* ☑ *Client Contact*

☑ *Data Package Narative* ☑ *Results and QC Summaries* ☑ Raw Data ☑ Chromatograms

ACTION: If no, contact lab for submission of missing or illegible information.

1.1 Laboratory Case Narrative: *Yes* [✓] *No* [ ] *N/A* [ ] *Comments:*

☑ *Narrative serves as an exception report for the project and method QA/QC performance.* ☐ *Narrative includes an explanation of each discrepancy on the Certification Statement.*

***ACTION**: If no, contact lab for submission of missing or illegible information.*

1.2 Chain of Custody (COC) copy present of completed COC? **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include a copy of the completed Chain of Custody forms containing all samples in this SDG?

ACTION: If no, contact lab for submission of missing completed *COC*.

1.3 Sample Receipt Information (*Cooler Receipt Form*): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory? **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☑ Container type noted ☑ Condition observed ☑ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.3.1 Were the correct bottles and preservatives used? **Yes** [✓] No [ ] N/A [ ] Comments:

Soil - 8 oz soil jar/cool to 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) if cooler temperature exceeds 10°C. Rejection of data requires professional judgment.

1.3.2 Were all samples delivered to the laboratory without breakage? **Yes** [✓] No [ ] N/A [ ] Comments:

1.3.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? Yes [ ] **No** [✓] N/A [ ] Comments:

1.4 Sample Results Section: *Was the following information supplied in the laboratory report for each sample?* **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Field ID and Lab ID ☑ *Date and time collected* ☑ Analyst Initials ☑ *Dilution Factor* ☑ % moisture or solids ☐ *Reporting limits* ☑ *Clean-up method* N/A ☑ Analysis method ☑ *Preparation method* ☑ *Date of preparation/extraction/ and analysis,* ☑ Matrix

☐ Target analytes and concentrations ☐ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.5 QA/QC Information: Was the following information provided in the laboratory report for each sample batch? **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Method blank results ☑ LCS recoveries ☑ MS/MSD recoveries and RPDs ☑ Surrogate recoveries

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times Yes [ ] **No [✓]** N/A [ ] Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded?

NOTE: For water samples, the holding time is 14 days from sampling to extraction and 30 days from extraction to analysis.

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. For soil samples professional judgement will be used to determine if rejection is necessary.

3.0 Laboratory Method **Yes [✓]** No [ ] N/A [ ] Comments:

3.1 Was the correct laboratory method used?
Soil Extraction *3546* or 3550B
N-nitrosodimethylamine mod 8270

ACTION: If no, contact project manager to inform Client of change; request variance from Client; contact laboratory to provide justification for method change compared to the requested method.

3.2 Are the practical quantitation limits the same as those specified by the method? **Yes [✓]** No [ ] N/A [ ] Comments:

NOTE: *The method specifies a reporting limit (RL) of 5.0 µg/kg. Results between the MDL and RL are qualified estimated J..*

Reporting Limits were 6.9 ug/kg – 9.1 ug/kg due to % Moisture

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample MDL is indeterminate, contact lab for explanation.

3.3 Did the laboratory complete a mulit-point initial calibration with a ~~RPD~~ %RSD ≤ 25? Is the low point standard ≤ ~~0.5 µg/L?~~ 2.0ng/ml **Yes** [✓] No [✓] Comments: %RSD of NDMA was 26.8%. Lab used Linear Regression. UJ All Results No Detects

Has a second source standard or spike been analyzed to verify working standards? **Yes** [✓] No [ ]

3.4 Did the laboratory analyze a continuing calibration every 12 hours or every 20 samples? Was the percent difference ≤ 30? **Yes** [✓] No [ ]

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 For the analysis of NDMA, has a method blank been analyzed for each analysis batch of field samples of 20 or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? **Yes** [✓] No [ ] N/A [ ] Comments:

4.4 Do any method blanks have positive results for NDMA parameters? Qualify data according to the following: Yes [ ] **No** [✓] N/A [ ] Comments:

For NDMA contaminants:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

5.0 Laboratory Control Sample

5.1 Was a laboratory control sample run with each analytical batch of 20 samples or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgment to determine the usability of sample results associated with that batch.

5.2 Is a LCS Summary Form present? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of control limits? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: LCS recovery limits 50-150% (MACTEC QAPP, 2009).

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit but > 10%, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

6.1 Were project specified MS/MSDs analyzed? List project samples that were spiked. **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the MS/MSD recovery form present? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.4 Are any NDMA spike recoveries outside of the QC limits? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$ Where: SSR = Spiked sample result
SR = Sample result
SA = Spike added

NOTE: *MS/MSD recovery limits as 50-150.*

NOTES: 1) Use professional judgment for the MS/MSD flags.

2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags are applied to samples based on professional judgement. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify both positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: RPD = $\frac{S-D}{(S+D)/2}$ x 100% Where: S = MS sample result
D = MSD sample result

NOTE: *MS/MSD RPD limits for soil ≤ 50.*

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Surrogate Recoveries

Is the surrogate recovery outside of limits for any sample or method blank? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: %R = Q/D x 100% Where: Q = sample surrogate result
D = surrogate concentration

NOTE: *QAPP (MACTEC, 2008) surrogate limits for waters 50-150%.*

ACTION: If recoveries are >10%: (1) For recoveries below the QC limit, qualify non-detects and positives (J), and (2) For recoveries above the QC limit, qualify only positives (J). If any surrogate recovery is <10% (unless the lab QC limits are below 10%, in which case, results are flagged as stated above), flag positives (J) and reject non-detects (R).

8.0 Sampling Accuracy

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the project chemist. **Yes** [ ] No [✓] N/A [ ] Comments:

8.2 Do any rinsate blanks have positive results? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of the samples and their associated field duplicates. **Yes** [ ] No [✓] N/A [ ] Comments:

9.2 Was the RPD ≤ 50% for soils? **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: RPD must be ≤50% for soil. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Calculation and Transcript Checks

- [✓] Initial Calibration See attached Excel
- [✓] Continuing Calibration
- [✓] Method Blank Raw Data Review
- [✓] NDMA Sample Result all ND
- [✓] LCS
- [✓] Surogate Recovery

REFERENCES:

MACTEC, 2009. Project Operation Plan Volume IIIB Quality Assurance Plan – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting..April 2009.

U.S. Environmental Protection Agency (USEPA), 1996. "Region 1 EPA-NE Data Validation Guidelines For Evaluating Environmental Analyses"; Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December 1996

MADEP, 2002. E-mail response dated November 13, 2002 from Oscar C. Pancorbo, Ph.D, Director, Sen. W.X. Wall Experiment Station, Massachusetts Dept. Environmental Protection and Christopher Pyott, Massachusetts Dept. of Environmental Protection, Northeast Regional Office.

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 480-30406-1
SDG No.:
Client Sample ID: OC-SD-SD-503-XXX
Lab Sample ID: 480-30406-1
Matrix: Solid
Lab File ID: 480-30406-B-1-A, 1-3-2013,
Analysis Method: GCMSMS_NDMA
Date Collected: 12/17/2012 14:30
Extraction Method: 3550B
Date Extracted: 12/20/2012 13:47
Sample wt/vol: 10.31(g)
Date Analyzed: 01/03/2013 16:24
Con. Extract Vol.: .5(mL)
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: VF-624MS ID: 0.25(mm)
% Moisture: 36.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 8232
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
62-75-9	N-Nitrosodimethylamine	ND	UJ	7.6	1.2

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17829-25-9	N-Nitrosodimethylamine-d6	101		50-150

3/4/13
TC

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 480-30406-1
SDG No.:
Client Sample ID: OC-SD-SD-504-XXX
Lab Sample ID: 480-30406-2
Matrix: Solid
Lab File ID: 480-30406-B-2-A, 1-3-2013,
Analysis Method: GCMSMS_NDMA
Date Collected: 12/17/2012 15:00
Extraction Method: 3550B
Date Extracted: 12/20/2012 13:47
Sample wt/vol: 9.73(g)
Date Analyzed: 01/03/2013 19:33
Con. Extract Vol.: .5(mL)
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: VF-624MS
ID: 0.25(mm)
% Moisture: 43.7
GPC Cleanup:(Y/N) N
Analysis Batch No.: 8232
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
62-75-9	N-Nitrosodimethylamine	ND	UJ	9.1	1.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17829-25-9	N-Nitrosodimethylamine-d6	94		50-150

3/4/13
TC

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 480-30406-1
SDG No.:
Client Sample ID: OC-SD-SD-501-XXX
Lab Sample ID: 480-30406-3
Matrix: Solid
Lab File ID: 480-30406-B-3-A, 1-3-2013,
Analysis Method: GCMSMS_NDMA
Date Collected: 12/17/2012 12:15
Extraction Method: 3550B
Date Extracted: 12/20/2012 13:47
Sample wt/vol: 10.18(g)
Date Analyzed: 01/03/2013 20:36
Con. Extract Vol.: .5(mL)
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: VF-624MS ID: 0.25(mm)
% Moisture: 28.5
GPC Cleanup:(Y/N) N
Analysis Batch No.: 8232
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
62-75-9	N-Nitrosodimethylamine	ND	UJ	6.9	1.0

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17829-25-9	N-Nitrosodimethylamine-d6	88		50-150

3/4/13
TC

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 480-30406-1
SDG No.:
Client Sample ID: OC-SD-SD-502-XXX
Lab Sample ID: 480-30406-4
Matrix: Solid
Lab File ID: 480-30406-B-4-A, 1-7-2013,
Analysis Method: GCMSMS_NDMA
Date Collected: 12/17/2012 12:45
Extraction Method: 3550B
Date Extracted: 12/20/2012 13:47
Sample wt/vol: 10.33(g)
Date Analyzed: 01/07/2013 23:11
Con. Extract Vol.: .5(mL)
Dilution Factor: 1
Injection Volume: 20(uL)
GC Column: VF-624MS ID: 0.25(mm)
% Moisture: 30.6
GPC Cleanup:(Y/N) N
Analysis Batch No.: 8340
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
62-75-9	N-Nitrosodimethylamine	ND	UJ	7.0	1.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17829-25-9	N-Nitrosodimethylamine-d6	129		50-150

TC
3/4/13

Olin Level I
Calculations
NDMA SDG 480-30406-1
OU1/OU2 SW and SD
Olin

12/4/2012	RRF										
Analyte	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	**Ave.**	**%SD**	**%RSD**
NDMA	****	2273	3796	4667	4513	4784	5284	6069	4483.71	119989.0	26.8
NDMA-d6	0.1898	0.19	0.2066	0.1926	0.2037	0.2007	0.1891	0.2024	0.19686	0.7	3.7

TestAmerica West Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121204-1670.b\2nd Source.10pg-uL, 12-4-2012, 9-12-17 PM.d		
Lims ID:	ICV	Client ID:	
Inject. Date:	04-Dec-2012 21:12:18	Dil. Factor:	1.0000
Sample Type:	ICV		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	6853	Lims Sample ID:	12
Sublist:			
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20121204-1670.b\NDMA_IT1.m		
Last Update:	05-Dec-2012 11:28:12	Calib Date:	04-Dec-2012 20:21:32
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121204-1670.b\CS-8...200pg-uL, 12-4-2012, 8-21-31 PM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	XAWRK025		

First Level Reviewer: nihartv Date: 05-Dec-2012 11:28:12

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.212	12.212	0.0	68	198987	108.7	100.0- 100.0	100.0		
81	12.185	12.212	-0.027		552033		303.0- 303.0	277.4		
2 N-Nitrosodimethylamine										
43	12.263	12.263	0.0	82	28701		100.0- 100.0	100.0	386	
47	12.263	12.263	0.0		19593		70.8- 70.8	68.3		
	Summary Peak				48294	10.2				
3 N-Nitrosomethylethylamine										
61	14.421	14.421	0.0	77	63773	10.1			Infinity	
4 N-Nitrosodiethylamine										
75	16.237	16.237	0.0	52	34158	11.4			Infinity	
* 5 2-Chloropyridine										
110	16.871	16.871	0.0	83	1859221	200.0	100.0- 100.0	100.0		
116	16.871	16.871	0.0		1519925		83.2- 83.2	81.8		
D 6 N-Nitrosodi-n-propylamine-d14										
97	20.798	20.798	0.0	73	547870	100.4				
7 N-Nitrosodi-n-propylamine										
89	21.014	21.014	0.0	51	84602	11.5			960	
8 N-Nitrosopyrrolidine										
55	21.787	21.787	0.0	65	84613	10.9			2664	
9 N-Nitrosopiperidine										
68	22.712	22.712	0.0	67	154860	11.0			8092	

$\frac{10.2}{10} - 1 = 2\%$ ✓

TC
3/4/13

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20130103-2068.b\CS-4...10pg-uL, 1-3-2013, 12-13-20 PM.d		
Lims ID:	CCV	Client ID:	
Inject. Date:	03-Jan-2013 12:13:21	Dil. Factor:	1.0000
Sample Type:	CCV		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	8232	Lims Sample ID:	1
Sublist:	chrom-NDMA_IT1*sub1		
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20130103-2068.b\NDMA_IT1.m		
Last Update:	04-Jan-2013 11:58:27	Calib Date:	04-Dec-2012 20:21:32
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121204-1670.b\CS-8...200pg-uL, 12-4-2012, 8-21-31 PM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	XAWRK029		

First Level Reviewer: nihartv Date: 04-Jan-2013 11:12:03

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.206	12.206	0.0	62	342545	98.9	100.0- 100.0	100.0		
81	12.180	12.206	-0.026		1209840		303.0- 303.0	353.2		
2 N-Nitrosodimethylamine										M
43	12.257	12.257	0.0	1	52968		100.0- 100.0	100.0	13.5	M
47	12.257	12.257	0.0		35655		70.8- 70.8	67.3		M
Summary Peak					88623	10.8				
3 N-Nitrosomethylethylamine										
61	14.402	14.402	0.0	82	95071	8.72			Infinity	
4 N-Nitrosodiethylamine										
75	16.225	16.225	0.0	47	42767	8.29			Infinity	
* 5 2-Chloropyridine										
110	16.855	16.855	0.0	78	3518964	200.0	100.0- 100.0	100.0		
116	16.855	16.855	0.0		2752256		83.2- 83.2	78.2		
D 6 N-Nitrosodi-n-propylamine-d14										
97	20.787	20.787	0.0	61	682555	66.1				
7 N-Nitrosodi-n-propylamine										
89	20.991	20.991	0.0	1	104128	11.4			348	
8 N-Nitrosopyrrolidine										
55	21.753	21.753	0.0	61	120527	12.5			1217	
9 N-Nitrosopiperidine										
68	22.695	22.695	0.0	58	196131	11.1			2036	

$\frac{10.8}{10} = 1.$ 8% ✓

TC
3/4/13

December Sediment

CHEMIST REVIEW-VALIDATION CHECKLIST

pH by 9045C ORP by SM 2580B

Project: Olin Chemical Superfund Site **Method: Hexavalent Chromium** by 7199
Project #: 6107130016-10 **Laboratory and SDG:** TAL-Buffalo/Edison NJ
Date: 3-4-13 Reviewer: Tige Cunningham

SDG 480-30406-1

☑ **Chemist Review** **Full Validation (add page 2)**
QC Limits listed below presented in the Olin Chemical Superfund Site QAPP [MACTEC, 2009].

1. **Case Narrative and Data Package Completeness (COC Review)**

Human Health PAL = 30mg/kg Eco PAL = 12.01mg/kg

✓

2. **Holding Time and Sample Preservation (30 days to digest, 7 days to analyze digestate)**

OK ✓

3. **QC Blanks**

Clean

4. **Laboratory Control Sample Review (% recovery 80-120, RPD 20)**

LCS 66% Recovery J/UJ all sediment samples

5. **Field Duplicate Precision (RPD 50)**

Not submitted

6. **Lab Duplicate Precision (RPD 35)**

not analyzed

7. **Matrix Spike Results (if applicable) (% recovery 75-125, RPD 35)**

not analyzed

8. **Surrogate Recovery (if applicable)**

Not applicable.

9. **Internal Standard Recovery (if applicable)**

Not applicable.

CHEMIST REVIEW-VALIDATION CHECKLIST

FULL VALIDATION CHECKS

Ten Percent of data sets will have full validation checks completed during chemist review.

☑ **Initial Calibration**

see attached excel

☑ **Continuing Calibration Verification**

see attached excel

Transcription and Calculation Checks

☑ **Instrument Calibration**

☑ **Blank Review – raw data/chromatogram check**

☑ **Laboratory Control Sample**

☑ **Matrix Spike**

N/A

☑ **Field Sample Results**

☐ **Surrogate Recovery**

Not applicable.

SDG 480-30406-1	Cr+6 Line from 12/28/2012		
Std Level	**Cr+6 Std Conc (ppb)**	**Area Response Cr+6**	
1	0.3	14517.00	
2	1	38198	
3	10	396772.00	
4	25	956106.00	
5	50	1893100.00	
6	75	2853900.00	
7	100	3768733.00	
	y	x	
	Cr+6		
slope	2.65105E-05	-0.245651777	**intercept**
+-	8.34448E-08	0.16389794	**+-**
r2	0.999950465	0.300208076	**s(y)**
F	100934.2012	5	**degrees of freedom**
regression ss	9096.683661	0.450624444	**residual ss**
ICV from 12/28/12 11:01			
Cr+6			
Response	1929533		
Amount Found (ug/l)	50.907		
Amount Nominal (ug/l)	50		
Percent recovery	101.81		
CCV 440-76371/16			
Cr+6			
Response	1851616		
Amount Found (ug/l)	48.842		
Amount Nominal (ug/l)	50		
Percent recovery	97.68		
LCS from 12/31/12 13:39			
Cr+6			
Response	1009473		
Amount Found (ug/l)	26.516		
Amount Nominal (ug/l)	40		
Percent Recovery (%)	66.29		
SAMPLE CALCULATION CHECK = OC-SD-SD-502-XXX			
Cr+6	on 1/1/13 21:03		
Response	24592		
Amount Found (ug/l)	0.406	see raw data sheet for calculation check	

FORM III
HPLC/IC LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-30406-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: LCS 440-75585/2-A Client ID:

COMPOUND	SPIKE ADDED (mg/Kg)	LCS CONCENTRATION (mg/Kg)	LCS % REC	QC LIMITS REC	#
Cr (VI)	15.9	10.5	66	65-110	

J/UJ all
Sed samples

Column to be used to flag recovery and RPD values

FORM III 7199

TC
3/4/13

FORM VI
HPLC/IC INITIAL CALIBRATION DATA
EXTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Irvine Job No.: 480-30406-1 Analy Batch No.: 75938

SDG No.:

Instrument ID: IC-16 GC Column: AS7 ID: 4(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/28/2012 08:59 Calibration End Date: 12/28/2012 10:27 Calibration ID: 3821

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD2 440-75938/21	Info 2_TAIIRV167_Hex
Level 2	STD3 440-75938/22	Info 2_TAIIRV167_Hex
Level 3	STD4 440-75938/23	Info 2_TAIIRV167_Hex
Level 4	STD5 440-75938/24	Info 2_TAIIRV167_Hex
Level 5	STD6 440-75938/25	Info 2_TAIIRV167_Hex
Level 6	STD7 440-75938/26	Info 2_TAIIRV167_Hex
Level 7	STD8 440-75938/27	Info 2_TAIIRV167_Hex

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
		LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Cr (VI)	Lin	14517 2853900	38198 3768733	396772	956106	1893100	0.300 75.0	1.00 100	10.0	25.0	50.0

Curve Type Legend:
Lin = Linear

tR calculated on excel sheet attached

tC 3/4/13

FORM VII
HPLC/IC CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Irvine Job No.: 480-30406-1

SDG No.:

Lab Sample ID: ICV 440-75938/29 Calibration Date: 12/28/2012 11:01

Instrument ID: IC-16 Calib Start Date: 12/28/2012 08:59

GC Column: AS7 ID: 4.00(mm) Calib End Date: 12/28/2012 10:27

Lab File ID: Info 2_TAIIRV167_Hex Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%REC	%REC LIMITS
Cr (VI)	Lin				50.9	50.0	102	90-110

$\frac{50.9}{50} =$

102%

3/4/13
TC

Report Date: 28-Dec-2012 11:24:45 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Irvine
Target Compound Quantitation Report

Data File:	\\Irvchrom\ChromData\IC16\20121228-16809.b\Info 2_TAIIRV167_Hex Chrom_20121228-111406.d		
Lims ID:	icv	Client ID:	
Inject. Date:	28-Dec-2012 11:01:00	Dil. Factor:	1.0000
Sample Type:	ICV		
Sample ID:	440-0016809-029		
Misc. Info.:	440-0016809-029		
Operator:	irvinorg	Instrument ID:	IC-16
Injection Vol:	1.0 ul	ALS Bottle#:	0
Lims Batch ID:	75938	Lims Sample ID:	29
Sublist:			
Raw Data:	Smoothed		
Detector:	GC Info 2_TAIIRV167_Hex Chrom_20121228-111406		
Method:	\\Irvchrom\ChromData\IC16\20121228-16809.b\218.6_16.m		
Method Label:	HEX CHROME		
Last Update:	28-Dec-2012 12:15:52	Calib Date:	28-Dec-2012 10:27:00
Quant Method:	External Standard	Quant By:	Initial Calibration
Last ICal File:	\\Irvchrom\ChromData\IC16\20121228-16809.b\Info 2_TAIIRV167_Hex Chrom_20121228-104026.d		
Limit Group:	IC-7199		
Integrator:	Falcon		
Column Type:		Column Dia:	
Process Host:	XAWRK024		

First Level Reviewer: phamq Date: 28-Dec-2012 11:24:44

Compound	RT	EXP RT	DLT RT	Response	On-Col Amt ug/l	Flags
1 Cr (VI)	8.287	8.262	0.025	1929533	50.9	

See attached excel
TC
3/4/13

Report Date: 31-Dec-2012 17:49:14 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Irvine
Target Compound Quantitation Report

Data File:	\\Irvchrom\ChromData\IC16\20121231-16916.b\Info 2_TAIIRV167_Hex Chrom_20121231-155911.d		
Lims ID:	ccv	Client ID:	
Inject. Date:	31-Dec-2012 15:46:00	Dil. Factor:	1.0000
Sample Type:	CCV		
Sample ID:	440-0016916-016		
Misc. Info.:	440-0016916-016		
Operator:	irvinorg	Instrument ID:	IC-16
Injection Vol:	1.0 ul	ALS Bottle#:	0
Lims Batch ID:	76371	Lims Sample ID:	16
Sublist:	chrom-218.6_16*sub1		
Raw Data:	Smoothed		
Detector:	GC Info 2_TAIIRV167_Hex Chrom_20121231-155911		
Method:	\\Irvchrom\ChromData\IC16\20121231-16916.b\218.6_16.m		
Method Label:	HEX CHROME		
Last Update:	31-Dec-2012 17:49:14	Calib Date:	28-Dec-2012 10:27:00
Quant Method:	External Standard	Quant By:	Initial Calibration
Last ICal File:	\\Irvchrom\ChromData\IC16\20121228-16809.b\Info 2_TAIIRV167_Hex Chrom_20121228-104026.d		
Limit Group:	IC-7199		
Integrator:	Falcon		
Column Type:		Column Dia:	
Process Host:	XAWRK004		

Compound	RT	EXP RT	DLT RT	Response	On-Col Amt ug/l	Flags
1 Cr (VI)	8.256	8.262	-0.006	1851616	48.9	

See attached excel

3/4/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30406-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 440-75585/2-A
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected:
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.26(g)
Date Analyzed: 12/31/2012 13:39
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76371
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	10.5		0.20	0.15

Target 15.9 mg/Kg

$\frac{26.6\,mg}{L} \times \frac{.05L}{1.26g} \times 10 =$

$\frac{10.5}{15.9} =$

66% Rec

TC
3/4/13

Report Date: 02-Jan-2013 06:05:52 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Irvine
Target Compound Quantitation Report

Data File:	\\Irvchrom\ChromData\IC16\20130101-16934.b\Info 2_TAIIRV167_Hex Chrom_20130101-211618.d		
Lims ID:	480-30406-A-4-A	Client ID:	OC-SD-SD-502-XXX
Inject. Date:	01-Jan-2013 21:03:00	Dil. Factor:	10.0000
Sample Type:	Client		
Sample ID:	440-0016934-024		
Misc. Info.:	440-0016934-024		
Operator:	irvinorg	Instrument ID:	IC-16
Injection Vol:	1.0 ul	ALS Bottle#:	0
Lims Batch ID:	76481	Lims Sample ID:	24
Raw Data:	Smoothed		
Detector:	GC Info 2_TAIIRV167_Hex Chrom_20130101-211618		
Method:	\\Irvchrom\ChromData\IC16\20130101-16934.b\218.6_16.m		
Method Label:	HEX CHROME		
Last Update:	02-Jan-2013 06:05:47	Calib Date:	28-Dec-2012 10:27:00
Quant Method:	External Standard	Quant By:	Initial Calibration
Last ICal File:	\\Irvchrom\ChromData\IC16\20121228-16809.b\Info 2_TAIIRV167_Hex Chrom_20121228-104026.d		
Limit Group:	IC-7199		
Integrator:	Falcon		
Column Type:		Column Dia:	
Process Host:	XAWRK016		

Compound	RT	EXP RT	DLT RT	Response	On-Col Amt ug/l	Flags
1 Cr (VI)	8.127	8.262	-0.135	24592	0.4606	

Sample calculation check
see Excel Sheet

$$\frac{0.4606\ mg}{L} \times \frac{.05L}{1.24g} \times 10 = \frac{0.1857\ mg/kg}{.694}$$

0.267 mg/kg
dry

3/4/13
TC

VOLATILE ORGANICS

8260C

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / (II) / III (circle one)

SITE: Olin Chemical Project #: 6107130016 SDG #: 480-30497-1

LAB #: 480-30497-1

Sample IDs: Attach tracking sheet and/or sample listing. OC-SW-SD-501-XXX
OC-SW-PZ-17RR-XXX OC-SW-SD-503-XXX
OC-SW-SD-1-XXX

This checklist is designed to be used with USEPA Region I Validation Guidelines Part II (12/1996). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES NO NA	
Data completeness ☑ ☐ ☐ All data summaries, QC forms and raw data available from hard copy or electronic data package ☑ ☐ ☐ Data summaries match EDD	Contact lab if missing data. Lab to respond with 24 hours. NOTE: SD-501 (2x), SD-503 (2x) analyzed @ Dilutions due to foaming.
Holding Times and Preservation ☑ ☐ ☐ Hold times met (14 days with preservation) ☑ ☐ ☐ Preserved (waters HCL, soils methanol)	Collected 12/17/12; analyzed 12/20/12
Instrument Performance Check (Tune) ☑ ☐ ☐ Tune available for each 12-hour period samples were analyzed ☑ ☐ ☐ Appropriate number of significant figures reported (at least 2) ☑ ☐ ☐ Mass/Charge list (m/z) criteria met	
Initial Calibration 12/3/12 ☑ ☐ ☐ %RSD less than or equal to 30% ☑ ☐ ☐ RRF greater than or equal to 0.05 except for 1,4-dioxane	1,4-dioxane .004; < Reg 1 limit .05 ! < CLP limit .005 ∴ J+/(R ND) all samples
Continuing Calibration 12/19/12 ☑ ☐ ☐ %D less than or equal to 25% ☑ ☐ ☐ RRF greater than or equal to 0.05. except for 1,4-dioxane	1,4-dioxane .0036; as above J+ (R ND)
Blank Contamination ☐ ☑ ☐ Method blank contamination ☐ ☐ ☑ Trip blank contamination ☐ ☐ ☑ Equipment/Rinseate blank contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.

VOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / II / III (circle one)

Surrogate Recoveries ☑ ☐ ☐ Surrogates percent recovery criteria met (water and soil: 70%-130%)	
Matrix Spikes and Laboratory Control Samples ☐ ☐ ☑ MS/MSD percent recovery criteria met (water and soil: 70%-130%) ☐ ☐ ☑ MS/MSD RPD criteria met (water and soil <30%) ☐ ☑ ☐ LCS percent recovery criteria (water and soil: 70%-130%)	LCS/LCSD: MEK 131 J+ -3,4 DCDFM 145/139 J+ ND
Field Duplicates ☐ ☐ ☑ RPD criteria (water <30%, soils <50%) met	
Internal Standard ☑ ☐ ☐ Area counts within -50 to +100 percent of calib. std. ☑ ☐ ☐ Retention Time within 30 seconds of calib. std.	
Target Compounds ☑ ☐ ☐ Reviewed narrative for anomalies	
Tentatively Identified Compounds (TICs) ☐ ☑ ☐ TCL compounds reported as TICs	No TICs detected.

Validator's Signature: Julie Rivard

Date: 2/14/13

Reference:

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-501-XXX**

Lab Sample ID: 480-30497-1
Client Matrix: Water

Date Sampled: 12/17/2012 1215
Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96661	Instrument ID:	HP5975T
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	T4547.D
Dilution:	2.0			Initial Weight/Volume:	5 mL
Analysis Date:	12/20/2012 0305			Final Weight/Volume:	5 mL
Prep Date:	12/20/2012 0305				

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	ND		0.70	2.0
1,1,1-Trichloroethane	ND		1.6	2.0
1,1,2,2-Tetrachloroethane	ND		0.42	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.62	2.0
1,1,2-Trichloroethane	ND		0.46	2.0
1,1-Dichloroethane	ND		0.76	2.0
1,1-Dichloroethene	ND		0.58	2.0
1,1-Dichloropropene	ND		1.4	2.0
1,2,3-Trichlorobenzene	ND		0.82	2.0
1,2,3-Trichloropropane	ND		1.8	2.0
1,2,4-Trichlorobenzene	ND		0.82	2.0
1,2,4-Trimethylbenzene	ND		1.5	2.0
1,2-Dibromo-3-Chloropropane	ND		0.78	10
1,2-Dichlorobenzene	ND		1.6	2.0
1,2-Dichloroethane	ND		0.42	2.0
1,2-Dichloropropane	ND		1.4	2.0
1,3,5-Trimethylbenzene	ND		1.5	2.0
1,3-Dichlorobenzene	ND		1.6	2.0
1,3-Dichloropropane	ND		1.5	2.0
1,4-Dichlorobenzene	ND		1.7	2.0
1,4-Dioxane	~~ND~~ R		19	100
2,2-Dichloropropane	ND		0.80	2.0
2,4,4-Trimethyl-1-pentene	ND		2.0	2.0
2,4,4-Trimethyl-2-pentene	ND		1.0	2.0
2-Butanone (MEK)	ND	*	2.6	20
2-Chlorotoluene	ND		1.7	2.0
2-Hexanone	ND		2.5	20
4-Chlorotoluene	ND		1.7	2.0
4-Isopropyltoluene	ND		0.62	2.0
4-Methyl-2-pentanone (MIBK)	ND		4.2	20
Acetone	ND		6.0	100
Benzene	ND		0.82	2.0
Bromobenzene	ND		1.6	2.0
Bromoform	ND		0.52	2.0
Bromomethane	ND		1.4	4.0
Carbon disulfide	ND		0.38	20
Carbon tetrachloride	ND		0.54	2.0
Chlorobenzene	ND		1.5	2.0
Chlorobromomethane	ND		1.7	2.0
Chlorodibromomethane	ND		0.64	1.0
Chloroethane	ND		0.64	4.0
Chloroform	ND		0.68	2.0
Chloromethane	ND		0.70	4.0
cis-1,2-Dichloroethene	ND		1.6	2.0
cis-1,3-Dichloropropene	ND		0.72	0.80
Cyclohexane	ND		0.36	2.0

JR 2/14/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-503-XXX**

Lab Sample ID: 480-30497-2
Client Matrix: Water

Date Sampled: 12/17/2012 1430
Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96661	Instrument ID:	HP5975T
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	T4548.D
Dilution:	2.0			Initial Weight/Volume:	5 mL
Analysis Date:	12/20/2012 0329			Final Weight/Volume:	5 mL
Prep Date:	12/20/2012 0329				

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	ND		0.70	2.0
1,1,1-Trichloroethane	ND		1.6	2.0
1,1,2,2-Tetrachloroethane	ND		0.42	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.62	2.0
1,1,2-Trichloroethane	ND		0.46	2.0
1,1-Dichloroethane	ND		0.76	2.0
1,1-Dichloroethene	ND		0.58	2.0
1,1-Dichloropropene	ND		1.4	2.0
1,2,3-Trichlorobenzene	ND		0.82	2.0
1,2,3-Trichloropropane	ND		1.8	2.0
1,2,4-Trichlorobenzene	ND		0.82	2.0
1,2,4-Trimethylbenzene	ND		1.5	2.0
1,2-Dibromo-3-Chloropropane	ND		0.78	10
1,2-Dichlorobenzene	ND		1.6	2.0
1,2-Dichloroethane	ND		0.42	2.0
1,2-Dichloropropane	ND		1.4	2.0
1,3,5-Trimethylbenzene	ND		1.5	2.0
1,3-Dichlorobenzene	ND		1.6	2.0
1,3-Dichloropropane	ND		1.5	2.0
1,4-Dichlorobenzene	ND		1.7	2.0
1,4-Dioxane	~~ND~~ R		19	100
2,2-Dichloropropane	ND		0.80	2.0
2,4,4-Trimethyl-1-pentene	ND		2.0	2.0
2,4,4-Trimethyl-2-pentene	ND		1.0	2.0
2-Butanone (MEK)	ND	*	2.6	20
2-Chlorotoluene	ND		1.7	2.0
2-Hexanone	ND		2.5	20
4-Chlorotoluene	ND		1.7	2.0
4-Isopropyltoluene	ND		0.62	2.0
4-Methyl-2-pentanone (MIBK)	ND		4.2	20
Acetone	ND		6.0	100
Benzene	ND		0.82	2.0
Bromobenzene	ND		1.6	2.0
Bromoform	ND		0.52	2.0
Bromomethane	ND		1.4	4.0
Carbon disulfide	ND		0.38	20
Carbon tetrachloride	ND		0.54	2.0
Chlorobenzene	ND		1.5	2.0
Chlorobromomethane	ND		1.7	2.0
Chlorodibromomethane	ND		0.64	1.0
Chloroethane	ND		0.64	4.0
Chloroform	ND		0.68	2.0
Chloromethane	ND		0.70	4.0
cis-1,2-Dichloroethene	ND		1.6	2.0
cis-1,3-Dichloropropene	ND		0.72	0.80
Cyclohexane	ND		0.36	2.0

2/14/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-1-XXX**

Lab Sample ID: 480-30497-3
Client Matrix: Water

Date Sampled: 12/17/2012 1530
Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96661	Instrument ID:	HP5975T
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	T4549.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	12/20/2012 0353			Final Weight/Volume:	5 mL
Prep Date:	12/20/2012 0353				

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	ND		0.35	1.0
1,1,1-Trichloroethane	ND		0.82	1.0
1,1,2,2-Tetrachloroethane	ND		0.21	0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.31	1.0
1,1,2-Trichloroethane	ND		0.23	1.0
1,1-Dichloroethane	ND		0.38	1.0
1,1-Dichloroethene	ND		0.29	1.0
1,1-Dichloropropene	ND		0.72	1.0
1,2,3-Trichlorobenzene	ND		0.41	1.0
1,2,3-Trichloropropane	ND		0.89	1.0
1,2,4-Trichlorobenzene	ND		0.41	1.0
1,2,4-Trimethylbenzene	ND		0.75	1.0
1,2-Dibromo-3-Chloropropane	ND		0.39	5.0
1,2-Dichlorobenzene	ND		0.79	1.0
1,2-Dichloroethane	ND		0.21	1.0
1,2-Dichloropropane	ND		0.72	1.0
1,3,5-Trimethylbenzene	ND		0.77	1.0
1,3-Dichlorobenzene	ND		0.78	1.0
1,3-Dichloropropane	ND		0.75	1.0
1,4-Dichlorobenzene	ND		0.84	1.0
1,4-Dioxane	~~ND~~ R		9.3	50
2,2-Dichloropropane	ND		0.40	1.0
2,4,4-Trimethyl-1-pentene	ND		1.0	1.0
2,4,4-Trimethyl-2-pentene	ND		0.50	1.0
2-Butanone (MEK)	25 J	*	1.3	10
2-Chlorotoluene	ND		0.86	1.0
2-Hexanone	ND		1.2	10
4-Chlorotoluene	ND		0.84	1.0
4-Isopropyltoluene	ND		0.31	1.0
4-Methyl-2-pentanone (MIBK)	ND		2.1	10
Acetone	12	J	3.0	50
Benzene	ND		0.41	1.0
Bromobenzene	ND		0.80	1.0
Bromoform	ND		0.26	1.0
Bromomethane	ND		0.69	2.0
Carbon disulfide	ND		0.19	10
Carbon tetrachloride	ND		0.27	1.0
Chlorobenzene	ND		0.75	1.0
Chlorobromomethane	ND		0.87	1.0
Chlorodibromomethane	ND		0.32	0.50
Chloroethane	ND		0.32	2.0
Chloroform	ND		0.34	1.0
Chloromethane	ND		0.35	2.0
cis-1,2-Dichloroethene	ND		0.81	1.0
cis-1,3-Dichloropropene	ND		0.36	0.40
Cyclohexane	ND		0.18	1.0

dr 2/14/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-PZ-17RR-XXX**

Lab Sample ID: 480-30497-4

Client Matrix: Water

Date Sampled: 12/17/2012 1545

Date Received: 12/17/2012 1850

8260C Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C	Analysis Batch:	480-96661	Instrument ID:	HP5975T
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	T4550.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	12/20/2012 0417			Final Weight/Volume:	5 mL
Prep Date:	12/20/2012 0417				

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1,2-Tetrachloroethane	ND		0.35	1.0
1,1,1-Trichloroethane	ND		0.82	1.0
1,1,2,2-Tetrachloroethane	ND		0.21	0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.31	1.0
1,1,2-Trichloroethane	ND		0.23	1.0
1,1-Dichloroethane	ND		0.38	1.0
1,1-Dichloroethene	ND		0.29	1.0
1,1-Dichloropropene	ND		0.72	1.0
1,2,3-Trichlorobenzene	ND		0.41	1.0
1,2,3-Trichloropropane	ND		0.89	1.0
1,2,4-Trichlorobenzene	ND		0.41	1.0
1,2,4-Trimethylbenzene	ND		0.75	1.0
1,2-Dibromo-3-Chloropropane	ND		0.39	5.0
1,2-Dichlorobenzene	ND		0.79	1.0
1,2-Dichloroethane	ND		0.21	1.0
1,2-Dichloropropane	ND		0.72	1.0
1,3,5-Trimethylbenzene	ND		0.77	1.0
1,3-Dichlorobenzene	ND		0.78	1.0
1,3-Dichloropropane	ND		0.75	1.0
1,4-Dichlorobenzene	ND		0.84	1.0
1,4-Dioxane	~~ND~~ R		9.3	50
2,2-Dichloropropane	ND		0.40	1.0
2,4,4-Trimethyl-1-pentene	1.4		1.0	1.0
2,4,4-Trimethyl-2-pentene	ND		0.50	1.0
2-Butanone (MEK)	7.1	J*	1.3	10
2-Chlorotoluene	ND		0.86	1.0
2-Hexanone	ND		1.2	10
4-Chlorotoluene	ND		0.84	1.0
4-Isopropyltoluene	ND		0.31	1.0
4-Methyl-2-pentanone (MIBK)	ND		2.1	10
Acetone	8.4	J	3.0	50
Benzene	ND		0.41	1.0
Bromobenzene	ND		0.80	1.0
Bromoform	ND		0.26	1.0
Bromomethane	ND		0.69	2.0
Carbon disulfide	ND		0.19	10
Carbon tetrachloride	ND		0.27	1.0
Chlorobenzene	ND		0.75	1.0
Chlorobromomethane	ND		0.87	1.0
Chlorodibromomethane	ND		0.32	0.50
Chloroethane	ND		0.32	2.0
Chloroform	ND		0.34	1.0
Chloromethane	ND		0.35	2.0
cis-1,2-Dichloroethene	ND		0.81	1.0
cis-1,3-Dichloropropene	ND		0.36	0.40
Cyclohexane	ND		0.18	1.0

2/14/13

SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / II / III (circle one)

SITE: Olin Chemical Superfund Site Project #: 6107130016 SDG #: 480-30497-1

LAB #: 480-30497-1

Sample IDs: Attach tracking sheet and/or sample listing. OC-SW-SD-501-XXX
OC-SW-PZ-17RR-XXX OC-SW-SD-503-XXX
OC-SW-SD-1-XXX

This checklist is designed to be used with USEPA Region I Validation Guidelines Part II (12/1996). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO	NA		
			Data completeness	
☑	☐	☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑	☐	☐	Data summaries match EDD	
			Holding Times and Preservation	Collected 12/17/12; extracted 12/21
☑	☐	☐	Hold times met (Waters – Extract within 7 days, analyze within 40 days. Soils – extract within 14 days, analyze within 40 days)	
			Instrument Performance Check (Tune)	
☑	☐	☐	Tune available for each 12-hour period samples were analyzed	
☑	☐	☐	Appropriate number of significant figures reported (at least 2)	
☑	☐	☐	Mass/Charge list (m/z) criteria met	
			Initial Calibration 12/18/12	
☑	☐	☐	%RSD less than or equal to 30%	
☑	☐	☐	RRF greater than or equal to 0.05	
			Continuing Calibration 12/28/12	Hexachlorobutadiene 29.9 J/UJ (ntc)
☐	☑	☐	%D less than or equal to 25%	2,4,6-Trichlorophenol 27.1 J (UJ)
☑	☐	☐	RRF greater than or equal to 0.05.	2,3,4,6-Tetrachlorophenol 45.8 J (UJ)
			Blank Contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.
☑	☐	☐	Method blank contamination	
☐	☐	☑	Equipment/Rinseate blank contamination	

TICs detected in blank were compared to sample detections; rejected where ~~co-eluting~~ @ same RT w/ similar mass spectra; see attached spectra & method blank TICs

ntc = not a target compound

gr 2/14/13

SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER I / II / III (circle one)

Surrogate Recoveries ☑ ☐ ☐ Surrogates percent recovery criteria met: Soil = (base/neutral 30%-130%, acid 30%-130%) Water = (base/neutral 30%-130%, acid 15%-110%)	
Matrix Spikes and Laboratory Control Samples ☐ ☐ ☑ MS/MSD percent recovery criteria met Soil and Water = (base/neutral 40%-140%, acid 30%-130%) ☐ ☐ ☑ MS/MSD RPD criteria met (soils <50%, water <30%) ☐ ☑ ☐ LCS percent recovery criteria met soil/water (base 40%-140%, acid 30%-130%)	LCS/LCSD: See attached summary for quals
Field Duplicates ☐ ☐ ☑ RPD criteria met (soils <50%, water <30%)	
Internal Standard ☑ ☐ ☐ Area counts within -50 to +100 percent of calib. std. ☑ ☐ ☐ Retention Time within 30 seconds of calib. std.	
Target Compounds ☑ ☐ ☐ Reviewed narrative for anomalies	(1) Lab reported both 4-methylphenol and 3+4-methylphenol; QAPP specifies 3+4-methylphenol ∴ 4-MP "Refuse flagged" in database
Tentatively Identified Compounds (TICs) ☐ ☑ ☐ TCL compounds reported as TICs	(2) N-nitroso-di propylamine also "Refuse flagged" since reported to lower RL by method 521

Validator's Signature: Julie Rivard

Date: 2/14/13

JR 3/13/13

Reference:

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

JN 3/13/13

Quality Control Results

Client: Olin Corporation

Job Number: 480-30497-1

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 480-97118

Method: 8270D
Preparation: 3510C

LCS Lab Sample ID:	LCS 480-97118/2-A	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Client Matrix:	Water	Prep Batch:	480-97118	Lab File ID:	X3362.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	12/28/2012 1217	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 480-97118/3-A	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Client Matrix:	Water	Prep Batch:	480-97118	Lab File ID:	X3363.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	12/28/2012 1243	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Dibenz(a,h)anthracene	76	75	40 - 140	0	20		
2-Nitrophenol	74	79	40 - 140	7	20		
Benzaldehyde	74	74	40 - 140	0	20		
2,4-Dimethylphenol	67	73	30 - 130	9	20		
Fluorene	92	85	40 - 140	8	20		
Di-n-octyl phthalate	68	70	40 - 140	3	20		
Carbazole	96	91	40 - 140	6	20		
Benzyl alcohol	76	71	40 - 140	6	20		
Benzo[a]pyrene	72	71	40 - 140	1	20		
4-Nitroaniline	79	86	40 - 140	8	20		
Aniline	65	63	40 - 140	3	20		
Bis(2-chloroethoxy)methane	83	78	40 - 140	6	20		
N-Nitrosodiphenylamine	101	101	40 - 140	1	20		
Acenaphthylene	86	84	40 - 140	2	20		
2-Chlorophenol	60	55	30 - 130	8	20		
4-Bromophenyl phenyl ether	106	95	40 - 140	11	20		
2-Nitroaniline	92	90	40 - 140	2	20		
Pentachlorophenol	68	71	30 - 130	4	20		
Dibenzofuran	95	94	40 - 140	1	20		
Hexachlorocyclopentadiene	68	64	40 - 140	6	20		
Benzo[a]anthracene	103	101	40 - 140	1	20		
Chrysene	81	90	40 - 140	10	20		
4,6-Dinitro-2-methylphenol	89	85	30 - 130	5	20		
1,2,4,5-Tetrachlorobenzene	86	82	40 - 140	6	20		
4-Chloroaniline	84	89	40 - 140	6	20		
2,4-Dinitrotoluene	102	98	40 - 140	4	20		
1-Methylnaphthalene	79	80	40 - 140	1	20		
Benzo[k]fluoranthene	81	82	40 - 140	1	20		
Atrazine	102	105	40 - 140	4	20		
Benzo[g,h,i]perylene	79	78	40 - 140	1	20		
2,4-Dichlorophenol J/UJ	85	66	30 - 130	25	20		*
Phenanthrene	98	92	40 - 140	6	20		
Caprolactam J/UJ	29	26	40 - 140	9	20	*	*
3-Nitroaniline	79	79	40 - 140	0	20		
Fluoranthene	109	106	40 - 140	3	20		
1,1'-Biphenyl	80	79	40 - 140	1	20		

gr 3/13/13

Quality Control Results

Client: Olin Corporation

Job Number: 480-30497-1

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 480-97118

Method: 8270D
Preparation: 3510C

LCS Lab Sample ID:	LCS 480-97118/2-A	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Client Matrix:	Water	Prep Batch:	480-97118	Lab File ID:	X3362.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	12/28/2012 1217	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 480-97118/3-A	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Client Matrix:	Water	Prep Batch:	480-97118	Lab File ID:	X3363.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1000 mL
Analysis Date:	12/28/2012 1243	Units:	ug/L	Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Benzo[b]fluoranthene J/UJ	85	68	40 - 140	22	20		*
2-Methylphenol	65	60	30 - 130	7	20		
N-Nitrosodi-n-propylamine	81	77	40 - 140	5	20		
Pyrene	93	90	40 - 140	3	20		
Benzoic acid J+/R ND	0.6	1	40 - 140	54	20	*	*
2-Methylnaphthalene	79	80	40 - 140	2	20		
Hexachlorobenzene	91	92	40 - 140	2	20		
Acenaphthene	77	74	40 - 140	3	20		
2,2'-oxybis[1-chloropropane]	71	63	40 - 140	12	20		
Phenyl ether	83	81	40 - 140	3	20		
2,3,4,6-Tetrachlorophenol	113	104	40 - 140	9	20		
4-Chloro-3-methylphenol	81	87	30 - 130	7	20		
4-Chlorophenyl phenyl ether	98	99	40 - 140	1	20		
Bis(2-ethylhexyl) phthalate	67	69	40 - 140	2	20		
Butyl benzyl phthalate	81	79	40 - 140	2	20		
Di-n-butyl phthalate	101	99	40 - 140	2	20		
Isophorone	81	87	40 - 140	7	20		
Phenol	35	34	30 - 130	3	20		
2,6-Dinitrotoluene	49	47	40 - 140	5	20		
Diethyl phthalate	87	87	40 - 140	0	20		
Indeno[1,2,3-cd]pyrene	75	74	40 - 140	1	20		
2,4,6-Trichlorophenol	100	93	30 - 130	7	20		
2,4,5-Trichlorophenol	92	111	30 - 130	18	20		
Benzophenone	79	81	40 - 140	2	20		
Nitrobenzene	81	82	40 - 140	1	20		
Anthracene	96	93	40 - 140	4	20		
Bis(2-chloroethyl)ether	70	65	40 - 140	7	20		
2-Chloronaphthalene	81	82	40 - 140	2	20		
2,4-Dinitrophenol	85	73	30 - 130	15	20		
4-Nitrophenol J/UJ	24	21	30 - 130	11	20	J *	J *
Acetophenone	79	78	40 - 140	1	20		
1,2-Dichlorobenzene	68	63	40 - 140	7	20		
3,3'-Dichlorobenzidine	75	73	40 - 140	3	20		
Hexachloroethane	54	53	40 - 140	1	20		
Dimethyl phthalate	92	92	40 - 140	1	20		
4-Methylphenol	61	55		10			

gr 3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-501-XXX**

Lab Sample ID: 480-30497-1
Client Matrix: Water

Date Sampled: 12/17/2012 1215
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3364.D
Dilution:	1.0			Initial Weight/Volume:	1050 mL
Analysis Date:	12/28/2012 1308			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Dibenz(a,h)anthracene	ND		0.29	0.95
2-Nitrophenol	ND		0.37	0.95
Benzaldehyde	ND		0.29	0.95
2,4-Dimethylphenol	ND		0.29	0.95
Fluorene	ND		0.29	0.95
Di-n-octyl phthalate	ND		0.29	0.95
Carbazole	ND		0.29	0.95
Benzyl alcohol	ND		0.29	1.9
Benzo[a]pyrene	ND		0.29	0.95
3 & 4 Methylphenol	ND		0.29	0.95
4-Nitroaniline	ND		0.80	4.8
Aniline	ND		0.29	0.95
Bis(2-chloroethoxy)methane	ND		0.29	0.95
N-Nitrosodiphenylamine	ND		0.29	0.95
Acenaphthylene	ND		0.29	0.95
2-Chlorophenol	ND		0.29	0.95
4-Bromophenyl phenyl ether	ND		0.29	0.95
2-Nitroaniline	ND		1.2	4.8
Pentachlorophenol	ND		0.29	0.95
Dibenzofuran	ND		0.29	0.95
Hexachlorocyclopentadiene	ND		0.29	1.9
Benzo[a]anthracene	ND		0.29	0.95
Chrysene	ND		0.29	0.95
4,6-Dinitro-2-methylphenol	ND		0.91	4.8
1,2,4,5-Tetrachlorobenzene	ND		0.29	0.95
4-Chloroaniline	ND		0.86	1.9
2,4-Dinitrotoluene	ND		0.29	0.95
1-Methylnaphthalene	ND		0.29	0.95
Benzo[k]fluoranthene	ND		0.49	0.95
Azobenzene	ND		0.29	0.95
Atrazine	ND		0.29	0.95
Benzo[g,h,i]perylene	ND		0.29	0.95
2,4-Dichlorophenol	ND J	*	0.29	0.95
Phenanthrene	ND		0.29	0.95
Caprolactam	ND J	*	0.29	0.95
3-Nitroaniline	ND		0.29	4.8
Fluoranthene	ND		0.29	0.95
1,1'-Biphenyl	ND		0.29	0.95
Benzo[b]fluoranthene	ND J	*	0.29	0.95
2-Methylphenol	ND		0.29	0.95
N-Nitrosodi-n-propylamine	~~ND~~ Refuse		0.29	0.95
Pyrene	ND		0.29	0.95
Benzoic acid	~~ND~~ R	*	0.43	4.8
2-Methylnaphthalene	ND		0.29	0.95
Hexachlorobenzene	ND		0.29	0.95
Acenaphthene	ND		0.29	0.95

3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-501-XXX**

Lab Sample ID: 480-30497-1
Client Matrix: Water

Date Sampled: 12/17/2012 1215
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3364.D
Dilution:	1.0			Initial Weight/Volume:	1050 mL
Analysis Date:	12/28/2012 1308			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,2'-oxybis[1-chloropropane]	ND		0.29	0.95
Phenyl ether	ND		0.29	0.95
2,3,4,6-Tetrachlorophenol	ND J		0.29	0.95
4-Chloro-3-methylphenol	ND		0.29	1.9
4-Chlorophenyl phenyl ether	ND		0.29	0.95
Bis(2-ethylhexyl) phthalate	ND		1.9	4.8
Butyl benzyl phthalate	ND		0.29	0.95
Di-n-butyl phthalate	ND		1.4	4.8
Isophorone	ND		0.29	0.95
Phenol	ND		0.29	0.95
2,6-Dinitrotoluene	ND		0.80	0.95
Diethyl phthalate	ND		0.31	0.95
Indeno[1,2,3-cd]pyrene	ND		0.29	0.95
2,4,6-Trichlorophenol	ND J		0.40	0.95
2,4,5-Trichlorophenol	ND		0.31	0.95
Benzophenone	ND		0.29	0.95
Nitrobenzene	ND		0.29	0.95
Anthracene	ND		0.29	0.95
Bis(2-chloroethyl)ether	ND		0.29	0.95
2-Chloronaphthalene	ND		0.29	0.95
2,4-Dinitrophenol	ND		0.77	0.95
4-Nitrophenol	ND J	*	0.40	4.8
Acetophenone	ND		0.29	0.95
1,2-Dichlorobenzene	ND		0.29	0.95
3,3'-Dichlorobenzidine	ND		0.34	1.9
Hexachloroethane	ND		0.29	0.95
Dimethyl phthalate	ND		0.29	0.95
4-Methylphenol	ND		0.29	0.95

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	108		15 - 110
Nitrobenzene-d5	71		30 - 130
Phenol-d5	20		15 - 110
2-Fluorobiphenyl	82		30 - 130
p-Terphenyl-d14	86		30 - 130
2-Fluorophenol	33		15 - 110

JR 3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-501-XXX**

Lab Sample ID: 480-30497-1
Client Matrix: Water

Date Sampled: 12/17/2012 1215
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3364.D
Dilution:	1.0			Initial Weight/Volume:	1050 mL
Analysis Date:	12/28/2012 1308			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 6

Cas Number	Analyte	RT	Est. Result (ug/L)	Qualifier
	~~Unknown~~	~~3.03~~	~~2.8~~	~~T J~~
	~~Unknown~~	~~7.71~~	~~0.92~~	~~T J~~
57305-27-8	~~Pregnane-3,20-dione, 11-[(trimethylsilyl~~	~~9.30~~	~~0.86~~	~~T J N~~
	~~Unknown~~	~~15.02~~	~~2.7~~	~~T J~~
	~~Unknown~~	~~15.82~~	~~5.7~~	~~T J~~
	~~Unknown~~	~~16.39~~	~~2.4~~	~~T J~~

gr 3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-503-XXX**

Lab Sample ID: 480-30497-2
Client Matrix: Water

Date Sampled: 12/17/2012 1430
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3365.D
Dilution:	1.0			Initial Weight/Volume:	1050 mL
Analysis Date:	12/28/2012 1334			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Dibenz(a,h)anthracene	ND		0.29	0.95
2-Nitrophenol	ND		0.37	0.95
Benzaldehyde	ND		0.29	0.95
2,4-Dimethylphenol	ND		0.29	0.95
Fluorene	ND		0.29	0.95
Di-n-octyl phthalate	ND		0.29	0.95
Carbazole	ND		0.29	0.95
Benzyl alcohol	ND		0.29	1.9
Benzo[a]pyrene	ND		0.29	0.95
3 & 4 Methylphenol	ND		0.29	0.95
4-Nitroaniline	ND		0.80	4.8
Aniline	ND		0.29	0.95
Bis(2-chloroethoxy)methane	ND		0.29	0.95
N-Nitrosodiphenylamine	ND		0.29	0.95
Acenaphthylene	ND		0.29	0.95
2-Chlorophenol	ND		0.29	0.95
4-Bromophenyl phenyl ether	ND		0.29	0.95
2-Nitroaniline	ND		1.2	4.8
Pentachlorophenol	ND		0.29	0.95
Dibenzofuran	ND		0.29	0.95
Hexachlorocyclopentadiene	ND		0.29	1.9
Benzo[a]anthracene	ND		0.29	0.95
Chrysene	ND		0.29	0.95
4,6-Dinitro-2-methylphenol	ND		0.91	4.8
1,2,4,5-Tetrachlorobenzene	ND		0.29	0.95
4-Chloroaniline	ND		0.86	1.9
2,4-Dinitrotoluene	ND		0.29	0.95
1-Methylnaphthalene	ND		0.29	0.95
Benzo[k]fluoranthene	ND		0.49	0.95
Azobenzene	ND		0.29	0.95
Atrazine	ND		0.29	0.95
Benzo[g,h,i]perylene	ND		0.29	0.95
2,4-Dichlorophenol	ND J	*	0.29	0.95
Phenanthrene	ND		0.29	0.95
Caprolactam	ND J	*	0.29	0.95
3-Nitroaniline	ND		0.29	4.8
Fluoranthene	ND		0.29	0.95
1,1'-Biphenyl	ND		0.29	0.95
Benzo[b]fluoranthene	ND J	*	0.29	0.95
2-Methylphenol	ND		0.29	0.95
N-Nitrosodi-n-propylamine	~~ND~~ Refuse		0.29	0.95
Pyrene	ND		0.29	0.95
Benzoic acid	~~ND~~ R	*	0.43	4.8
2-Methylnaphthalene	ND		0.29	0.95
Hexachlorobenzene	ND		0.29	0.95
Acenaphthene	ND		0.29	0.95

JR 3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-503-XXX**

Lab Sample ID: 480-30497-2
Client Matrix: Water

Date Sampled: 12/17/2012 1430
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3365.D
Dilution:	1.0			Initial Weight/Volume:	1050 mL
Analysis Date:	12/28/2012 1334			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,2'-oxybis[1-chloropropane]	ND		0.29	0.95
Phenyl ether	ND		0.29	0.95
2,3,4,6-Tetrachlorophenol	ND J		0.29	0.95
4-Chloro-3-methylphenol	ND		0.29	1.9
4-Chlorophenyl phenyl ether	ND		0.29	0.95
Bis(2-ethylhexyl) phthalate	ND		1.9	4.8
Butyl benzyl phthalate	ND		0.29	0.95
Di-n-butyl phthalate	ND		1.4	4.8
Isophorone	ND		0.29	0.95
Phenol	ND		0.29	0.95
2,6-Dinitrotoluene	ND		0.80	0.95
Diethyl phthalate	ND		0.31	0.95
Indeno[1,2,3-cd]pyrene	ND		0.29	0.95
2,4,6-Trichlorophenol	ND J		0.40	0.95
2,4,5-Trichlorophenol	ND		0.31	0.95
Benzophenone	ND		0.29	0.95
Nitrobenzene	ND		0.29	0.95
Anthracene	ND		0.29	0.95
Bis(2-chloroethyl)ether	ND		0.29	0.95
2-Chloronaphthalene	ND		0.29	0.95
2,4-Dinitrophenol	ND		0.77	0.95
4-Nitrophenol	ND J	*	0.40	4.8
Acetophenone	ND		0.29	0.95
1,2-Dichlorobenzene	ND		0.29	0.95
3,3'-Dichlorobenzidine	ND		0.34	1.9
Hexachloroethane	ND		0.29	0.95
Dimethyl phthalate	ND		0.29	0.95
4-Methylphenol	ND		0.29	0.95

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	101		15 - 110
Nitrobenzene-d5	79		30 - 130
Phenol-d5	23		15 - 110
2-Fluorobiphenyl	82		30 - 130
p-Terphenyl-d14	72		30 - 130
2-Fluorophenol	37		15 - 110

3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-503-XXX**

Lab Sample ID: 480-30497-2
Client Matrix: Water

Date Sampled: 12/17/2012 1430
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3365.D
Dilution:	1.0			Initial Weight/Volume:	1050 mL
Analysis Date:	12/28/2012 1334			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/L)	Qualifier
	~~Unknown~~	~~3.05~~	~~2.6~~	~~T J~~
	Unknown	✓ 4.09	1.6	T J
541-2-6	~~Cyclopentasiloxane, decamethyl-~~	~~7.74~~	~~1.8~~	~~T J N~~
	~~Unknown~~	~~9.31~~	~~1.7~~	~~T J~~
	Unknown	✓ 14.43	1.4	T J
	~~Unknown~~	~~15.03~~	~~3.2~~	~~T J~~
	~~Unknown~~	~~15.82~~	~~7.6~~	~~T J~~
	~~Unknown~~	~~16.40~~	~~4.3~~	~~T J~~
	~~Unknown~~	~~16.54~~	~~7.5~~	~~T J~~
	Unknown	✓ 16.99	8.8	T J

3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-1-XXX**

Lab Sample ID: 480-30497-3
Client Matrix: Water

Date Sampled: 12/17/2012 1530
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3366.D
Dilution:	1.0			Initial Weight/Volume:	1010 mL
Analysis Date:	12/28/2012 1400			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Dibenz(a,h)anthracene	ND		0.30	0.99
2-Nitrophenol	ND		0.39	0.99
Benzaldehyde	ND		0.30	0.99
2,4-Dimethylphenol	ND		0.30	0.99
Fluorene	ND		0.30	0.99
Di-n-octyl phthalate	ND		0.30	0.99
Carbazole	ND		0.30	0.99
Benzyl alcohol	ND		0.30	2.0
Benzo[a]pyrene	ND		0.30	0.99
3 & 4 Methylphenol	ND		0.30	0.99
4-Nitroaniline	ND		0.83	5.0
Aniline	ND		0.30	0.99
Bis(2-chloroethoxy)methane	ND		0.30	0.99
N-Nitrosodiphenylamine	ND		0.30	0.99
Acenaphthylene	ND		0.30	0.99
2-Chlorophenol	ND		0.30	0.99
4-Bromophenyl phenyl ether	ND		0.30	0.99
2-Nitroaniline	ND		1.2	5.0
Pentachlorophenol	ND		0.30	0.99
Dibenzofuran	ND		0.30	0.99
Hexachlorocyclopentadiene	ND		0.30	2.0
Benzo[a]anthracene	ND		0.30	0.99
Chrysene	ND		0.30	0.99
4,6-Dinitro-2-methylphenol	ND		0.95	5.0
1,2,4,5-Tetrachlorobenzene	ND		0.30	0.99
4-Chloroaniline	ND		0.89	2.0
2,4-Dinitrotoluene	ND		0.30	0.99
1-Methylnaphthalene	ND		0.30	0.99
Benzo[k]fluoranthene	ND		0.50	0.99
Azobenzene	ND		0.30	0.99
Atrazine	ND		0.30	0.99
Benzo[g,h,i]perylene	ND		0.30	0.99
2,4-Dichlorophenol	ND J	*	0.30	0.99
Phenanthrene	ND		0.30	0.99
Caprolactam	ND J	*	0.30	0.99
3-Nitroaniline	ND		0.30	5.0
Fluoranthene	ND		0.30	0.99
1,1'-Biphenyl	ND		0.30	0.99
Benzo[b]fluoranthene	ND J	*	0.30	0.99
2-Methylphenol	ND		0.30	0.99
N-Nitrosodi-n-propylamine	~~ND~~ Refuse		0.30	0.99
Pyrene	ND		0.30	0.99
Benzoic acid	~~ND~~ R	*	0.45	5.0
2-Methylnaphthalene	ND		0.30	0.99
Hexachlorobenzene	ND		0.30	0.99
Acenaphthene	ND		0.30	0.99

JR 3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-1-XXX**

Lab Sample ID: 480-30497-3

Client Matrix: Water

Date Sampled: 12/17/2012 1530

Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3366.D
Dilution:	1.0			Initial Weight/Volume:	1010 mL
Analysis Date:	12/28/2012 1400			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,2'-oxybis[1-chloropropane]	ND		0.30	0.99
Phenyl ether	ND		0.30	0.99
2,3,4,6-Tetrachlorophenol	ND J		0.30	0.99
4-Chloro-3-methylphenol	ND		0.30	2.0
4-Chlorophenyl phenyl ether	ND		0.30	0.99
Bis(2-ethylhexyl) phthalate	ND		2.0	5.0
Butyl benzyl phthalate	ND		0.30	0.99
Di-n-butyl phthalate	ND		1.5	5.0
Isophorone	ND		0.30	0.99
Phenol	ND		0.30	0.99
2,6-Dinitrotoluene	ND		0.83	0.99
Diethyl phthalate	ND		0.33	0.99
Indeno[1,2,3-cd]pyrene	ND		0.30	0.99
2,4,6-Trichlorophenol	ND		0.42	0.99
2,4,5-Trichlorophenol	ND J		0.33	0.99
Benzophenone	ND		0.30	0.99
Nitrobenzene	ND		0.30	0.99
Anthracene	ND		0.30	0.99
Bis(2-chloroethyl)ether	ND		0.30	0.99
2-Chloronaphthalene	ND		0.30	0.99
2,4-Dinitrophenol	ND		0.80	0.99
4-Nitrophenol	ND J	*	0.42	5.0
Acetophenone	ND		0.30	0.99
1,2-Dichlorobenzene	ND		0.30	0.99
3,3'-Dichlorobenzidine	ND		0.36	2.0
Hexachloroethane	ND		0.30	0.99
Dimethyl phthalate	ND		0.30	0.99
4-Methylphenol	ND		0.30	0.99

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	103		15 - 110
Nitrobenzene-d5	73		30 - 130
Phenol-d5	24		15 - 110
2-Fluorobiphenyl	84		30 - 130
p-Terphenyl-d14	94		30 - 130
2-Fluorophenol	41		15 - 110

JR 3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-SD-1-XXX**

Lab Sample ID: 480-30497-3
Client Matrix: Water

Date Sampled: 12/17/2012 1530
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3366.D
Dilution:	1.0			Initial Weight/Volume:	1010 mL
Analysis Date:	12/28/2012 1400			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/L)	Qualifier
	Unknown	3.03	2.4	T J
	Unknown	8.81	2.7	T J
	Unknown	8.86	5.0	T J
	Unknown	14.54	2.0	T J
	Unknown	15.35	2.1	T J
	Unknown	15.81	6.8	T J
	Unknown	16.10	2.6	T J
301-2-0	9-Octadecenamide, (Z)-	16.40	3.3	T J N
	Unknown	16.53	5.1	T J
	Unknown	17.34	5.2	T J

JR 3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-PZ-17RR-XXX**

Lab Sample ID: 480-30497-4
Client Matrix: Water

Date Sampled: 12/17/2012 1545
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3367.D
Dilution:	1.0			Initial Weight/Volume:	1040 mL
Analysis Date:	12/28/2012 1426			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Dibenz(a,h)anthracene	ND		0.29	0.96
2-Nitrophenol	ND		0.38	0.96
Benzaldehyde	ND		0.29	0.96
2,4-Dimethylphenol	ND		0.29	0.96
Fluorene	ND		0.29	0.96
Di-n-octyl phthalate	ND		0.29	0.96
Carbazole	ND		0.29	0.96
Benzyl alcohol	ND		0.29	1.9
Benzo[a]pyrene	ND		0.29	0.96
3 & 4 Methylphenol	ND		0.29	0.96
4-Nitroaniline	ND		0.81	4.8
Aniline	ND		0.29	0.96
Bis(2-chloroethoxy)methane	ND		0.29	0.96
N-Nitrosodiphenylamine	ND		0.29	0.96
Acenaphthylene	ND		0.29	0.96
2-Chlorophenol	ND		0.29	0.96
4-Bromophenyl phenyl ether	ND		0.29	0.96
2-Nitroaniline	ND		1.2	4.8
Pentachlorophenol	ND		0.29	0.96
Dibenzofuran	ND		0.29	0.96
Hexachlorocyclopentadiene	ND		0.29	1.9
Benzo[a]anthracene	ND		0.29	0.96
Chrysene	ND		0.29	0.96
4,6-Dinitro-2-methylphenol	ND		0.92	4.8
1,2,4,5-Tetrachlorobenzene	ND		0.29	0.96
4-Chloroaniline	ND		0.87	1.9
2,4-Dinitrotoluene	ND		0.29	0.96
1-Methylnaphthalene	ND		0.29	0.96
Benzo[k]fluoranthene	ND		0.49	0.96
Azobenzene	ND		0.29	0.96
Atrazine	ND		0.29	0.96
Benzo[g,h,i]perylene	ND		0.29	0.96
2,4-Dichlorophenol	ND J	*	0.29	0.96
Phenanthrene	ND		0.29	0.96
Caprolactam	ND J	*	0.29	0.96
3-Nitroaniline	ND		0.29	4.8
Fluoranthene	ND		0.29	0.96
1,1'-Biphenyl	ND		0.29	0.96
Benzo[b]fluoranthene	ND J	*	0.29	0.96
2-Methylphenol	ND		0.29	0.96
N-Nitrosodi-n-propylamine	~~ND~~ Refuse		0.29	0.96
Pyrene	ND		0.29	0.96
Benzoic acid	~~ND~~ R	*	0.43	4.8
2-Methylnaphthalene	ND		0.29	0.96
Hexachlorobenzene	ND		0.29	0.96
Acenaphthene	ND		0.29	0.96

3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-PZ-17RR-XXX**

Lab Sample ID: 480-30497-4
Client Matrix: Water

Date Sampled: 12/17/2012 1545
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3367.D
Dilution:	1.0			Initial Weight/Volume:	1040 mL
Analysis Date:	12/28/2012 1426			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,2'-oxybis[1-chloropropane]	ND		0.29	0.96
Phenyl ether	ND		0.29	0.96
2,3,4,6-Tetrachlorophenol	ND J		0.29	0.96
4-Chloro-3-methylphenol	ND		0.29	1.9
4-Chlorophenyl phenyl ether	ND		0.29	0.96
Bis(2-ethylhexyl) phthalate	ND		1.9	4.8
Butyl benzyl phthalate	ND		0.29	0.96
Di-n-butyl phthalate	ND		1.4	4.8
Isophorone	ND		0.29	0.96
Phenol	ND		0.29	0.96
2,6-Dinitrotoluene	ND		0.81	0.96
Diethyl phthalate	ND		0.32	0.96
Indeno[1,2,3-cd]pyrene	ND		0.29	0.96
2,4,6-Trichlorophenol	ND J		0.40	0.96
2,4,5-Trichlorophenol	ND		0.32	0.96
Benzophenone	ND		0.29	0.96
Nitrobenzene	ND		0.29	0.96
Anthracene	ND		0.29	0.96
Bis(2-chloroethyl)ether	ND		0.29	0.96
2-Chloronaphthalene	ND		0.29	0.96
2,4-Dinitrophenol	ND		0.78	0.96
4-Nitrophenol	ND J	*	0.40	4.8
Acetophenone	ND		0.29	0.96
1,2-Dichlorobenzene	ND		0.29	0.96
3,3'-Dichlorobenzidine	ND		0.35	1.9
Hexachloroethane	ND		0.29	0.96
Dimethyl phthalate	ND		0.29	0.96
4-Methylphenol	ND		0.29	0.96

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	108		15 - 110
Nitrobenzene-d5	52		30 - 130
Phenol-d5	20		15 - 110
2-Fluorobiphenyl	67		30 - 130
p-Terphenyl-d14	87		30 - 130
2-Fluorophenol	22		15 - 110

3/13/13

Client: Olin Corporation

Job Number: 480-30497-1

Client Sample ID: **OC-SW-PZ-17RR-XXX**

Lab Sample ID: 480-30497-4
Client Matrix: Water

Date Sampled: 12/17/2012 1545
Date Received: 12/17/2012 1850

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97673	Instrument ID:	HP5973X
Prep Method:	3510C	Prep Batch:	480-97118	Lab File ID:	X3367.D
Dilution:	1.0			Initial Weight/Volume:	1040 mL
Analysis Date:	12/28/2012 1426			Final Weight/Volume:	1 mL
Prep Date:	12/21/2012 1501			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 10

Cas Number	Analyte	RT	Est. Result (ug/L)	Qualifier
	~~Unknown~~	~~3.05~~	~~2.8~~	~~T J~~
	Unknown	✓ 4.39	2.8	T J
	~~Unknown~~	~~7.73~~	~~1.3~~	~~T J~~
	Unknown	✓ 8.87	1.5	T J
	~~Unknown~~	~~15.03~~	~~4.5~~	~~T J~~
	~~Unknown~~	~~15.37~~	~~9.7~~	~~T J~~
	~~Unknown~~	~~15.82~~	~~3.7~~	~~T J~~
	Unknown	✓ 16.11	2.4	T J
112-84-5	~~Erucylamide~~	~~16.41~~	~~2.4~~	~~T J N~~
	~~Unknown~~	~~16.54~~	~~8.9~~	~~T J~~

JW 3/13/13

VOLATILE/SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER III

SITE: Olin Chemical Project #: 6107130016 SDG #: 480-30497-1

LAB #: 480-30497-1

Sample IDs: Attach tracking sheet and/or sample listing. OC-SW-SD-1-XXX

This checklist is designed to be used with USEPA Region I Validation Guidelines Part II (12/1996). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

YES	NO	NA		
Holding Times and Preservation				
☑	☐	☐	Check the raw data including instrument run and extraction logs to verify reported sample extraction and analysis dates.	
☑	☐	☐	Check the raw data including extraction and instrument run logs to verify reported sample extraction and analysis dates.	
Instrument Performance Check (Tune)				
☑	☐	☐	Compare the reported tuning results on each GC/MS Tuning and Mass Calibration Form with each raw data mass listing and mass spectrum submitted.	Since the spectra are obtained from chromatographic peaks that should be free from coelution problems, background subtraction actions resulting in spectral distortions for the sole purpose of meeting the contract or method specifications are contrary to quality assurance objectives and are, therefore, unacceptable.
☑	☐	☐	Verify that the laboratory has not made any transcription or calculation errors.	
☑	☐	☐	If possible, verify that spectra were generated using appropriate background subtraction techniques.	
Initial Calibration				
☑	☐	☐	Verify that the same instrument parameters were used for sample and calibration analyses, and that the instrument parameters which were utilized met method requirements.	
☑	☐	☐	Check and recalculate the average RRF and RRF for at least one volatile and semivolatile target compound associated with each internal standard.	Verify that the recalculated values agree within 10% of the laboratory reported values.
☑	☐	☐	Check and recalculate the %RSD for at least one volatile and semivolatile target compound associated with each internal standard.	

VOLATILE/SEMIVOLATILE ORGANICS

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER III

☐	☐	☑	Review Standard Preparation Logs (if provided in the data package) to ensure that primary and secondary initial calibration standard concentrations are accurate and traceable to NIST standards.	
☐	☐	☑	Check and recalculate the initial calibration standard concentration for one volatile and one semivolatile target compound (if standards preparation documentation was provided in the data package).	Verify that the recalculated values agree within 10% of the laboratory reported values.
Continuing Calibration				
☑	☐	☐	Verify that the same instrument parameters were used for sample and calibration analyses, and that the instrument parameters which were utilized met method requirements.	
☑	☐	☐	Check and recalculate the RRF for at least one volatile and semivolatile target compound associated with each internal standard.	
☑	☐	☐	Check and recalculate the %D for at least one volatile and semivolatile target compound associated with each internal standard.	Verify that the recalculated values agree within 10% of the laboratory reported values.
☐	☐	☑	Review Standard Preparation Logs (if provided in the data package) to ensure that primary and secondary continuing calibration standard concentrations are accurate and traceable to NIST standards.	
☐	☐	☑	Check and recalculate the continuing calibration standard concentration for one volatile and one semivolatile target compound (if standards preparation documentation was provided in the data package).	
Blanks				
☑	☐	☐	Verify from the raw data that the extraction and/or analysis dates and times, sample IDs, file IDs, etc. are accurately reported on the tabulated result forms.	
☐	☐	☑	Verify from the raw data, the Blank Summary form, and Form Is that a VOA instrument blank was analyzed in the same purging/sparging vessel (i.e, same position in the autosampler) as the sample that exceeded the instrument	

REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER III

			calibration range.	
☐	☐	☑	Verify from the raw GPC data that a GPC instrument blank was analyzed after the GPC calibration and prior to sample analysis.	
☐	☐	☑	Verify from the raw Silica Gel data that a Silica Gel Column reagent blank was analyzed prior to sample analysis.	
☑	☐	☐	Check 10% of the raw data for each blank to verify that internal standard areas and retention time data, have been correctly transcribed to tabulated forms and that surrogate compound recovery data have been correctly calculated and transcribed to tabulated forms.	lab initially used wrong RRFs
☑	☐	☐	Review the raw data (chromatograms, mass spectra and quantitation reports) to confirm the presence of target and non-target compounds in the blanks and to evaluate the presence of additional contaminants.	Review the blank chromatograms, quantitation reports, and mass spectra to ensure that no false positives or false negatives have been reported. for all SVOC calculations; lab corrected and reissued data pkg. 3/12/13 JR 3/13/13
Surrogates				
☑	☐	☐	Check raw data (e.g., chromatograms and quantitation reports) to verify that surrogate recoveries were reported accurately on the Surrogate Recovery Forms.	
☑	☐	☐	Ten percent of the surrogate compound recovery data should be checked for calculation and/or transcription errors. If errors are detected in this ten percent, then an additional ten percent of the data should be checked. If errors are found I the additional 10%, then all surrogate compound recovery calculations and transcriptions in the data package should be checked.	See above.
Internal Standards				
☑	☐	☐	Check raw data (e.g., chromatograms and quantitation reports) to verify that the internal standard retention times and areas are accurately reported on the tabulated forms.	
Field Duplicates				
☐	☐	☑	Check and recalculate the analytical concentration for at least one positive detect and one sample quantitation limit (for a diluted sample or soil sample) for each fraction, in every field duplicate	

			sample.	
MDL Study				
☑	☐	☐	Check and recalculate the %RSD and % recoveries for at least three compounds per MDL study.	Verify that the recalculated values agree within 10% of the laboratory reported values.
☐ Not provided	☐	☑	Check the standards preparation logs to verify that the stock standard used to prepare the LFB was from a source independent from the initial and continuing calibration standards.	MDL study provided for SVOC does not appear to be low level analysis; no other study provided for aqueous SVOC.
☐	☐	☑	Check and recalculate % recovery for at least one compound per LFB fraction.	Verify that the recalculated values agree within 10% of the laboratory reported values.
PE Samples/Accuracy Check				
☑	☐	☐	Check and recalculate the percent recovery for at least one compound per LCS fraction.	Verify that the recalculated values agree within 10% of the laboratory reported values.
☐	☐	☑	Determine what percentage of analytes were below or above PES acceptance criteria.	
☐	☐	☑	Check and recalculate the analytical concentrations for at least one compound per PES fraction.	Verify that the recalculated values agree within 10% of the laboratory reported values.
Target Compound Identification				
☑	☐	☐	Check that the RRT of a reported compound is within+/- 0.06 RRT units of the standard RRT.	
☑	☐	☐	Compare all sample compound spectra to the laboratory standard spectra and verify that the mass spectral identification criteria are met.	
☑	☐	☐	Check the sample chromatogram to verify that all major peaks of interest are identified as either target compounds, TICs, surrogate compounds, or the internal standards.	
☑	☐	☐	The validator should be aware of situations when sample carryover is a possibility, and should use professional judgment to determine if instrument cross-contamination has affected any	

			compound identification.	
Compound Quantitation and Reported Quant Limits				
☑	☐	☐	Recalculate, from the raw data, the concentrations for at least one positive detect and one sample quantitation limit (for a diluted sample or a soil sample) for each fraction, in every field sample to verify that laboratory reported sample results were accurately calculated according to the method.	Lab initially used wrong RRFs for all SVOC calculations; reports for all QC & samples were corrected by the lab and re-issued 3/12/13 gr 3/13/13
☑	☐	☐	Verify that the concentrations for positive detects and sample quantitation limits have been adjusted to reflect sample dilutions, concentrations, cleanup methods and dry weight factors that are not accounted for in the method.	
☑	☐	☐	Verify that the correct internal standard, quantitation ion and standard RRF were used to quantitate sample results for at least one positive detect in each fraction in every field sample.	
Tentatively Identified Compounds				
☑	☐	☐	Verify that the laboratory has generated a library search for all required peaks in the sample and blank chromatograms.	No TICs reported in VOC samples; SVOC TICs evaluated for presence in method blank, and all common* TICs were removed from samples for final reporting
☑	☐	☐	Verify that a target compound was not missed by the target compound search procedure and erroneously reported as a TIC in the proper analytical fraction.	
☑	☐	☐	Verify that all TICs are reported with estimated (J) concentrations by the laboratory. Verify that TIC concentrations were calculated correctly, assuming a RRF of 1.0 and using the closest eluting IS that is free of interferences.	
☑	☐	☐	Verify that the blanks do not contain any TIC peaks.	
☑	☐	☐	Examine all TIC mass spectra in every sample and blank.	* i.e. matching spectra & RT in blank and sample. Common lab contaminants: CO2, siloxanes, diethyl ether, hexane,certain freons, and phthalates.
☑	☐	☐	Verify that TICs were reported as unknowns if the TIC spectra presented do not meet criteria set forth in Section XIV B.4.	Solvent preservatives: cyclohexene, cyclohexanone, cyclohexenone, cyclohexanol, cyclohexenol, chlorocyclohexene, and

☑	☐	☐	Review blank and sample TIC spectra to ensure that common laboratory artifacts/contaminants are not reported as TICs.	chlorocyclohexanol. Aldol condensation reaction products.
SVOC Cleanup				
Gel Permeation Chromatography (GPC)				
☐ N/A	☐	☐	Verify that the GPC system was calibrated initially in accordance with the method requirements and that peak shape and resolution criteria were met.	
☐	☐	☐	Confirm from the raw data that the GPC calibration check was performed at the method required frequency.	
☐	☐	☐	Verify that a GPC calibration check solution was analyzed in accordance with the method and that the correct target and surrogate compounds, interferents and concentrations were used.	
☐	☐	☐	Verify that surrogate compound recoveries and internal standard area counts and/or retention times in the GPC calibration check meet method QC acceptance.	
☐	☐	☐	Review the raw GPC calibration check data to verify that peaks are symmetrical and resolution meets method QC acceptance criteria for target and surrogate compounds and interferents in the GPC calibration check solution.	
☐	☐	☐	Check the raw GPC calibration check data to verify that retention times for any compounds or interferents in the GPC calibration solution did not vary more than +/-5% between calibrations.	
☐	☐	☐	Verify that a GPC instrument blank was analyzed after each GPC calibration and calibration check and prior to sample analysis.	
☐	☐	☐	Verify that there are no target compounds present at greater than or equal to the quantitation limit in the GPC instrument blank.	
☐	☐	☐	Verify that surrogate compound recoveries and internal standard area counts and/or retention times (if added) in the GPC instrument blank meet method QC acceptance criteria.	
☐	☐	☐	Compare the raw data to the reported results, if available, and verify that no calculation and/or transcription errors	

			have occurred. If the result forms are not available, then the validator must review the cleanup logs to confirm that method required cleanups were performed.	
Silica Gel Cleanup				
☐ N/A	☐	☐	Verify that a Silica Gel Check solution was prepared and analyzed in accordance with the method and that the correct target and surrogate compounds, interferents, and concentrations were used.	
☐	☐	☐	Verify that surrogate compound recoveries and internal standard area counts and/or retention times in the Silica Gel Check solution meet method QC acceptance criteria..	
☐	☐	☐	Verify that a Silica Gel column reagent blank was prepared with each cleanup batch and was analyzed after the Silica Gel Check solution but prior to field samples.	
☐	☐	☐	Verify that there are no target compounds present at greater than or equal to the quantitation limit in the Silica Gel column reagent blank.	
☐	☐	☐	Verify that surrogate compound recoveries and internal standard area counts and/or retention times (if added) in the Silica Gel column reagent blank meet method QC acceptance criteria.	
☐	☐	☐	Compare the raw data to the reported results, if available, and verify that no calculation and/or transcription errors have occurred. If the result forms are not available, then the validator must review the cleanup logs to confirm that method required cleanups were performed.	
System Performance				
☐ All OK;	☐	☑	Evaluate all PES and other relevant QC data to determine if any analytical trends exist over the sample analysis period.	
☐ no PE samples available	☐	☑	The validator should ascertain from the PES and other relevant QC data if there is a high or low quantitative bias for a particular compound or group of compounds.	
☐	☐	☑	The validator should ascertain from the PES and other relevant QC data if there is a potential for false negative and/or false	

			positives to be reported.
☑ OK	☐	☐	The validator should ascertain from the MS/MSD and surrogate spike compound analyses if the sample matrix effects impact compound recovery, thus indicating a method bias outside the control of the laboratory.
☑ OK	☐	☐	Evaluate sample and QC sample reconstructed ion chromatograms analyzed on all columns to determine if the column chromatography, peak shape,, resolution, and baseline drift has either deteriorated or improved over the sample analysis period.
☑ OK	☐	☐	The validator should ascertain from the raw data if unacceptable chromatography may contribute to a high or a low quantitative bias for a particular compound or group of compounds.
☑ OK	☐	☐	The validator should also ascertain from the raw data if unacceptable chromatography may result in a potential for false negative and/or false positive identification.
☑ OK	☐	☐	The validator should determine if chromatography prolems are a result of the sample matrix or are unique to the instrument.
☑ OK	☐	☐	The validator should determine if significant retention time shifts have occurred between initial and continuing calibration.
☑ OK	☐	☐	Compare the daily standard calibration area counts to ascertain if the instrument generated consistent detector responses over the sample analysis period.
☑ OK	☐	☐	Review the area counts of the internal standards and surrogate compounds for each sample to ascertain if there is a change in detector response.
☐	☐	☑	The validator should evaluate the MS/MSD RPDs in conjunction with field duplicate RPDs to identify any analytical trends, ascertain if sample matrices were homogenous or heterogeneous, and determine if sampling error may have contributed to field imprecision.
☑ Not available	☐	☑	Review all daily LFBs, low level calibrated standards, and PES data to evaluate sensitivity for each instrument to verify that no instrument has lost its ability to to

			accurately quantitate and identify compounds at the quantitation limit over the sample analysis period, which could possibly result in false negatives and low biased results.
☑	☐	☐	Check the area counts of the individual sample, QC sample, calibration and blank internal standards to monitor instrument sensitivity changes.
☑ OK	☐	☐	Review the sample chromatograms for abrupt, discrete shifts in the chromatographic baseline which may indicate a change in the instrument's sensitivity or the zero setting.
☑ OK	☐	☐	The validator may determine that instrument sensitivity is adequate but sample matrix effects may preclude obtaining the quantitation limits required by the project DQOs using the analytical method employed.
☑ OK	☐	☐	Review all blank and sample results to evaluate the possibility of sample contamination introduced via either cross contamination from a previously run sample or from general lab contamination.
☐	☐	☑	Compare blank analysis on two different instruments to determine if the contamination is instrument related or the interferents are present in the blank from sample processing activities.
☐	☐	☑	Assess whether problematic blank results are reproducible when replicate aliquots are analyzed or are sporadic interferences.

Validator's Signature: Julie Miranda

Date: 2/19/13

Reference:

U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

BFB - VOC

Report Date: 19-Dec-2012 17:46:54 Chrom Revision: 2.0 22-Oct-2012 16:30:48

Data File: \\Bufchrom\ChromData\HP5975T\20121219-17709.b\T4524.D\T-8260.rslt\spectra.d
Injection Date: 19-Dec-2012 17:31:30
Spectrum: Tune Spec: Scans 563-565(4.92-4.93) Bgrd 554(4.86)
Base Peak: 95.00
Minimum % Base Peak: 0
Number of Points: 46

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	438	56.00	959	75.00	29760	95.00	54128
37.00	3075	57.00	2389	76.00	2314	96.00	3515
38.00	3414	60.00	688	77.00	177	106.00	173
39.00	1196	61.00	3227	79.00	2421	141.00	421
44.00	1383	62.00	3025	80.00	615	143.00	566
45.00	604	63.00	2346	81.00	2428	173.00	375
47.00	363	68.00	5806	82.00	441	174.00	40232
48.00	183	69.00	6337	87.00	2372	175.00	2778
49.00	2663	70.00	390	88.00	2218	176.00	38776
50.00	12437	72.00	175	92.00	2107	177.00	2421
51.00	4149	73.00	3087	93.00	2791		
52.00	197	74.00	10750	94.00	7889		

m/z $\frac{50}{95} = \frac{12437}{54128} = 22.98$ OK

m/z $\frac{175}{174} = \frac{2778}{40232} = 6.9$ OK

2/14/13

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1 Analy Batch No.: 93813

SDG No.:

Instrument ID: HP5975T GC Column: ZB-624 (60) ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2012 13:54 Calibration End Date: 12/03/2012 13:54 Calibration ID: 11363

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
1,2,4-Trichlorobenzene	0.6710	0.6103 0.7223	0.7504	0.7735	0.7643	Ave		0.7153			0.2000	8.9		15.0			
Hexachlorobutadiene	0.3334 0.2492	0.2919 0.2627	0.3490	0.3060	0.3047	Ave		0.2996				12.0		15.0			
Naphthalene	2.2217	1.7617 2.4844	2.3556	2.2479	2.2658	Ave		2.2228				11.0		15.0			
1,2,3-Trichlorobenzene	0.5739	0.4883 0.6626	0.6970	0.6845	0.6206	Ave		0.6211				13.0		15.0			
1,2-Dichloroethane-d4 (Surr)	0.3623	0.3611 0.3654	0.3290	0.3025	0.3590	Ave		0.3466				7.3		15.0			
Toluene-d8 (Surr)	1.2536	1.1432 1.2317	1.0360	0.8507	1.2901	Ave		1.1342				15.0		15.0			
4-Bromofluorobenzene (Surr)	0.3545	0.3110 0.3527	0.3315	0.2927	0.3674	Ave		0.3350				8.6		15.0			

RRF 1,2,4 - TB =
.6103
.7504
.7735
.7643
.6710
.7223
/6 = .7153 OK

%RSD = .063335 / .7153 = 8.85% OK
gr 2/19/13

ICAL - VOC

Note: The ml coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1 Analy Batch No.: 93813

SDG No.:

Instrument ID: HP5975T GC Column: ZB-624 (60) ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2012 13:54 Calibration End Date: 12/03/2012 13:54 Calibration ID: 11363

ANALYTE	RRF LVL 1 LVL 6	RRF LVL 2 LVL 7	RRF LVL 3	RRF LVL 4	RRF LVL 5	CURVE TYPE	COEFFICIENT B	COEFFICIENT M1	COEFFICIENT M2	#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
1,2-Dichloropropane	0.3263	0.2604 0.3332	0.3223	0.2993	0.3111	Ave		0.3088			0.1000	8.6		15.0			
Dibromomethane	0.2030	0.1914 0.2086	0.1988	0.1889	0.1936	Ave		0.1974				3.8		15.0			
Dichlorobromomethane	0.4073	0.3033 0.4202	0.3683	0.3598	0.3847	Ave		0.3739			0.1000	11.0		15.0			
2-Chloroethyl vinyl ether	0.2543	0.1973 0.2602	0.2238	0.2496	0.2517	Ave		0.2395				10.0		15.0			
cis-1,3-Dichloropropene	0.4507 0.5082	0.3508 0.5231	0.4725	0.4513	0.4797	Ave		0.4623			0.2000	12.0		15.0			
4-Methyl-2-pentanone (MIBK)	0.4624	0.3979 0.4708	0.4234	0.4571	0.4494	Ave		0.4435			0.0500	6.2		15.0			
Toluene	0.8778	0.8066 0.8935	0.8195	0.8139	0.8454	Ave		0.8428			0.4000	4.3		15.0			
trans-1,3-Dichloropropene	0.3507 0.5314	0.3175 0.5442	0.4418	0.4655	0.4826	Lin1	-0.149	0.5299			0.1000				0.9970		0.9900
Ethyl methacrylate	0.5373	0.4423 0.5653	0.4700	0.5322	0.5290	Ave		0.5127				9.1		15.0			
1,1,2-Trichloroethane	0.2843	0.2279 0.2940	0.2703	0.2683	0.2656	Ave		0.2684			0.1000	8.4		15.0			
Tetrachloroethene	0.3276	0.2985 0.3361	0.3059	0.2898	0.3214	Ave		0.3132			0.1000	5.7		15.0			
1,3-Dichloropropane	0.5682	0.4821 0.5824	0.5468	0.5437	0.5473	Ave		0.5451				6.3		15.0			
2-Hexanone	0.3348	0.2625 0.3448	0.3055	0.3253	0.3251	Ave		0.3163			0.0500	9.3		15.0			
Chlorodibromomethane	0.3266	0.2131 0.3545	0.2892	0.2982	0.2997	Lin1	-0.192	0.3407			0.1000				0.9960		0.9900
Ethylene Dibromide	0.3441	0.2634 0.3577	0.3279	0.3226	0.3251	Ave		0.3235			0.1000	10.0		15.0			
Chlorobenzene	0.9330	0.8069 0.9371	0.8905	0.8893	0.8993	Ave		0.8927			0.5000	5.3		15.0			
1,1,1,2-Tetrachloroethane	0.3059	0.2878 0.3179	0.2843	0.2913	0.2878	Ave		0.2958				4.5		15.0			
Ethylbenzene	1.6322	1.3789 1.6844	1.5919	1.5075	1.5710	Ave		1.5610			0.1000	6.9		15.0			
m-Xylene & p-Xylene	0.6257	0.5172 0.6340	0.5986	0.5939	0.6001	Ave		0.5949			0.1000	7.0		15.0			
o-Xylene	0.6047	0.5408 0.6210	0.6130	0.6006	0.5915	Ave		0.5953			0.3000	4.8		15.0			

RAL - WC

RRF Ethylbenzene = 1.3789 + 1.5919 + 1.5075 + 1.5710 + 1.6322 + 1.6844 / 6 = 1.56098

Note: The mean coefficient is the same as Ave RRF for an Ave curve type.

%RSD = 0.10712 / 1.56098 = 6.86% OK

gr 2/19/13

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1 Analy Batch No.: 93813

SDG No.:

Instrument ID: HP5975T GC Column: ZB-624 (60) ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2012 13:54 Calibration End Date: 12/03/2012 13:54 Calibration ID: 11363

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Methylene Chloride	0.3020	0.4523 0.3041	0.3265	0.2906	0.2994	Lin1	0.1298	0.2995			0.1000				1.0000		0.9900
trans-1,2-Dichloroethene	0.2810	0.2587 0.2902	0.2879	0.2602	0.2793	Ave		0.2762			0.1000	4.9		15.0			
Methyl tert-butyl ether	0.9614	0.8191 0.9933	0.9314	0.9904	0.9759	Ave		0.9452			0.1000	7.0		15.0			
Acrylonitrile	0.1370	0.1144 0.1387	0.1253	0.1329	0.1375	Ave		0.1310				7.2		15.0			
1,1-Dichloroethane	0.5334	0.4931 0.5395	0.5348	0.4794	0.5217	Ave		0.5170			0.2000	4.8		15.0			
Vinyl acetate	0.7057	0.5258 0.7343	0.6188	0.6683	0.6876	Ave		0.6568				11.0		15.0			
2,2-Dichloropropane	0.2400	0.1947 0.2301	0.2424	0.2124	0.2302	Ave		0.2250				8.1		15.0			
cis-1,2-Dichloroethene	0.3297	0.2717 0.3259	0.3287	0.3039	0.3167	Ave		0.3128			0.1000	7.1		15.0			
2-Butanone (MEK)	0.1854	0.1804 0.1879	0.1665	0.1819	0.1818	Ave		0.1807			0.0500	4.1		15.0			
Chlorobromomethane	0.1610	0.1474 0.1606	0.1567	0.1542	0.1494	Ave		0.1549				3.6		15.0			
Tetrahydrofuran	0.1215	0.0897 0.1217	0.1120	0.1193	0.1199	Ave		0.1140				11.0		15.0			
Chloroform	0.5274	0.4650 0.5319	0.5206	0.4785	0.5149	Ave		0.5064			0.2000	5.5		15.0			
Cyclohexane	0.4737	0.4248 0.5011	0.4420	0.5298	0.5122	Ave		0.4806			0.1000	8.6		15.0			
1,1,1-Trichloroethane	0.4188	0.3383 0.4191	0.3966	0.3636	0.4053	Ave		0.3903			0.1000	8.4		15.0			
Carbon tetrachloride	0.3571	0.2451 0.3690	0.3202	0.2769	0.3429	Ave		0.3185			0.1000	15.0		15.0			
1,1-Dichloropropene	0.4051	0.3625 0.4063	0.3776	0.3373	0.3968	Ave		0.3809				7.2		15.0			
Benzene	1.2392	1.0476 1.2388	1.2553	1.1254	1.1861	Ave		1.1821			0.5000	6.9		15.0			
1,2-Dichloroethane	0.4403	0.3420 0.4408	0.4179	0.4005	0.4284	Ave		0.4117			0.1000	9.1		15.0			
Trichloroethene	0.3016	0.2824 0.3074	0.2981	0.2731	0.2991	Ave		0.2936			0.2000	4.4		15.0			
Methylcyclohexane	0.4628	0.4438 0.4966	0.4323	0.5156	0.5059	Ave		0.4762			0.1000	7.3		15.0			

Note: The ml coefficient is the same as Ave RRF for an Ave curve type.

RAL - VOC

$RRF_{MEK} = (.1804 + .1665 + .1819 + .1818 + .1854 + .1879)/6 = .18065$ OK

$\%RSD = \sqrt{(.00000063 + .00020223 + .00001563 + .00001323 + .00022563 + .00052563)/5}\,/.18065 = 4.1\%$

gr 2/19/13

IRAL - VOC

Report Date: 06-Dec-2012 01:43:55 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5975T\20121203-17185.b\T3875.D		
Lims ID:	IC	Client ID:	
Inject. Date:	03-Dec-2012 21:04:30	Dil. Factor:	1.0000
Sample Type:	IC	Calib Level:	2
Sample ID:	IC		
Misc. Info.:	480-0017185-003		
Operator:	LH	Instrument ID:	HP5975T
Purge Vol:	5.000 mL	ALS Bottle#:	60
Lims Batch ID:	93813	Lims Sample ID:	3
Sublist:	chrom-T-8260*sub3		
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5975T\20121203-17185.b\T-8260.m		
Last Update:	06-Dec-2012 01:43:54	Calib Date:	03-Dec-2012 21:04:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5975T\20121203-17185.b\T3875.D		
Limit Group:	MV - 8260MCP_RCP		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	ZB-624	Column Dia:	0.25 mm
Process Host:	XAWRK033		

First Level Reviewer: HillL Date: 04-Dec-2012 11:55:01

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/L	Flags
* 1 1,4-Difluorobenzene	114	4.501	4.501	0.0	95	621174	25.0	
* 2 Chlorobenzene-d5	117	6.709	6.709	0.0	86	547446	25.0	
* 3 1,4-Dichlorobenzene-d4	152	8.564	8.564	0.0	96	264461	25.0	
$ 4 1,2-Dichloroethane-d4 (Surr)	65	4.190	4.190	0.0	0	8973	1.04	
$ 6 Toluene-d8 (Surr)	98	5.589	5.589	0.0	81	25034	1.01	
$ 7 4-Bromofluorobenzene (Surr)	174	7.641	7.641	0.0	71	6811	0.9285	
11 Dichlorodifluoromethane	85	0.936	0.936	0.0	72	5014	0.8939	
13 Chloromethane	50	1.061	1.050	0.011	88	8242	1.07	
14 Vinyl chloride	62	1.133	1.133	0.0	75	7489	0.8643	
15 Bromomethane	94	1.361	1.361	0.0	71	6698	1.16	
16 Chloroethane	64	1.444	1.444	0.0	68	5967	1.22	
17 Trichlorofluoromethane	101	1.610	1.610	0.0	71	4800	1.39	
21 Acrolein	56	2.014	2.014	0.0	93	18646	15.2	
20 1,1,2-Trichloro-1,2,2-trifluoroe	101	2.035	2.035	0.0	58	5244	0.9744	
22 1,1-Dichloroethene	96	2.045	2.045	0.0	87	5182	0.9329	
23 Acetone	43	2.170	2.170	0.0	78	10343	4.26	
24 Iodomethane	142	2.190	2.180	0.010	40	6494	0.9033	
25 Carbon disulfide	76	2.211	2.201	0.010	94	16405	0.8816	
28 Methyl acetate	43	2.439	2.439	0.0	92	7105	0.8794	
29 Acetonitrile	40	2.449	2.449	0.0	99	15972	28.8	
30 Methylene Chloride	84	2.501	2.501	0.0	75	11238	1.08	
32 trans-1,2-Dichloroethene	96	2.698	2.698	0.0	94	6427	0.9365	
33 Methyl tert-butyl ether	73	2.708	2.708	0.0	87	20352	0.8665	
34 Acrylonitrile	53	2.781	2.771	0.010	92	14212	4.37	
36 1,1-Dichloroethane	63	3.071	3.071	0.0	68	12252	0.9538	
39 Vinyl acetate	43	3.144	3.144	0.0	96	65325	4.00	
42 2,2-Dichloropropane	77	3.517	3.517	0.0	73	4838	0.8655	
43 cis-1,2-Dichloroethene	96	3.548	3.548	0.0	76	6750	0.8686	
(1) 44 2-Butanone (MEK)	43	3.610	3.600	0.010	95	22415	4.99	

JV 2/19/13

$RRF_{MEK} = \frac{22415}{621174} \times \frac{25}{5} = 0.1804$ ✓

IRAL - VOC

Report Date: 06-Dec-2012 01:43:55 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5975T\20121203-17185.b\T3875.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/L	Flags
47 Chlorobromomethane	128	3.734	3.745	-0.011	87	3663	0.9517	
48 Tetrahydrofuran	42	3.786	3.765	0.021	87	11146	3.93	
50 Chloroform	83	3.807	3.807	0.0	75	11554	0.9183	
52 Cyclohexane	56	3.890	3.890	0.0	86	10554	0.8838	
51 1,1,1-Trichloroethane	97	3.900	3.890	0.010	74	8405	0.8667	
53 Carbon tetrachloride	117	4.004	4.004	0.0	61	6089	0.7693	
54 1,1-Dichloropropene	75	4.014	4.014	0.0	79	9006	0.9515	
55 Benzene	78	4.180	4.190	-0.010	94	26029	0.8862	
57 1,2-Dichloroethane	62	4.252	4.242	0.010	89	8498	0.8308	
60 Trichloroethene	95	4.677	4.667	0.010	79	7018	0.9620	
62 Methylcyclohexane	83	4.760	4.760	0.0	86	11026	0.9320	
63 1,2-Dichloropropane	63	4.874	4.864	0.010	74	6470	0.8433	
65 Dibromomethane	93	4.968	4.968	0.0	72	4756	0.9697	
67 Dichlorobromomethane	83	5.092	5.092	0.0	74	7535	0.8110	
69 2-Chloroethyl vinyl ether	63	5.330	5.320	0.010	90	24511	4.12	
71 cis-1,3-Dichloropropene	75	5.424	5.424	0.0	66	8716	0.7588	
72 4-Methyl-2-pentanone (MIBK)	43	5.558	5.548	0.010	94	43563	4.49	
73 Toluene	92	5.641	5.641	0.0	91	17662	0.9570	
75 trans-1,3-Dichloropropene	75	5.859	5.859	0.0	74	6953	0.8798	
77 Ethyl methacrylate	69	5.911	5.900	0.011	69	9686	0.8628	
78 1,1,2-Trichloroethane	83	6.004	6.004	0.0	80	4991	0.8491	
79 Tetrachloroethene	166	6.035	6.035	0.0	77	6537	0.9530	
80 1,3-Dichloropropane	76	6.118	6.118	0.0	82	10558	0.8845	
81 2-Hexanone	43	6.190	6.190	0.0	92	28745	4.15	
82 Chlorodibromomethane	129	6.294	6.294	0.0	60	4667	1.19	
83 Ethylene Dibromide	107	6.367	6.367	0.0	66	5768	0.8143	
86 Chlorobenzene	112	6.729	6.729	0.0	77	17669	0.9039	
89 1,1,1,2-Tetrachloroethane	131	6.802	6.802	0.0	30	6302	0.9729	
(2) 88 Ethylbenzene	91	6.802	6.802	0.0	94	30194	0.8833	
90 m-Xylene & p-Xylene	106	6.895	6.895	0.0	99	22650	1.74	
91 o-Xylene	106	7.206	7.206	0.0	93	11842	0.9084	
92 Styrene	104	7.227	7.227	0.0	91	18564	0.8331	
93 Bromoform	173	7.403	7.403	0.0	46	2386	1.28	
95 Isopropylbenzene	105	7.496	7.496	0.0	88	28075	0.8686	
97 Bromobenzene	156	7.755	7.755	0.0	87	6012	0.7747	
98 1,1,2,2-Tetrachloroethane	83	7.797	7.797	0.0	42	8022	0.8204	
99 N-Propylbenzene	91	7.817	7.817	0.0	95	33611	0.8572	
100 1,2,3-Trichloropropane	110	7.828	7.828	0.0	38	2888	0.9585	
101 trans-1,4-Dichloro-2-butene	53	7.838	7.838	0.0	68	4815	7.25	
105 2-Chlorotoluene	126	7.900	7.900	0.0	87	7082	0.9511	
104 1,3,5-Trimethylbenzene	105	7.962	7.962	0.0	89	22335	0.8570	
102 4-Chlorotoluene	91	7.994	7.994	0.0	88	25274	0.9305	
106 tert-Butylbenzene	134	8.222	8.222	0.0	78	4659	0.8872	
107 1,2,4-Trimethylbenzene	105	8.263	8.263	0.0	87	24180	0.9146	
109 sec-Butylbenzene	105	8.398	8.398	0.0	86	29532	0.9057	
110 1,3-Dichlorobenzene	146	8.501	8.501	0.0	86	13016	0.8953	
111 4-Isopropyltoluene	119	8.522	8.522	0.0	92	24565	0.9307	
113 1,4-Dichlorobenzene	146	8.584	8.584	0.0	71	13872	0.9218	
115 n-Butylbenzene	91	8.854	8.854	0.0	89	22578	0.9164	
116 1,2-Dichlorobenzene	146	8.885	8.885	0.0	91	12603	0.9214	
117 1,2-Dibromo-3-Chloropropane	75	9.558	9.558	0.0	7	1271	0.8514	
(3) 119 1,2,4-Trichlorobenzene	180	10.201	10.201	0.0	65	6456	0.8532	

RRF Ethylbenzene = $\frac{30194}{547446} \times \frac{25}{1}$ = 1.3789 OK

RRF 1,2,4-TCB = $\frac{6456}{264461} \times \frac{25}{1}$ = 0.6103 OK

CCAL - VOC

Report Date: 19-Dec-2012 18:14:26 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5975T\20121219-17709.b\T4525.D		
Lims ID:	CCVIS	Client ID:	
Inject. Date:	19-Dec-2012 17:54:30	Dil. Factor:	1.0000
Sample Type:	CCVIS		
Sample ID:	CCVIS		
Misc. Info.:	480-0017709-002		
Operator:	RAL	Instrument ID:	HP5975T
Purge Vol:	5.000 mL	ALS Bottle#:	27
Lims Batch ID:	96661	Lims Sample ID:	2
Sublist:	chrom-T-8260*sub3		
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5975T\20121219-17709.b\T-8260.m		
Last Update:	19-Dec-2012 18:14:26	Calib Date:	03-Dec-2012 21:04:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5975T\20121203-17185.b\T3875.D		
Limit Group:	MV - 8260MCP_RCP		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	ZB-624	Column Dia:	0.25 mm
Process Host:	XAWRK011		

First Level Reviewer: larsonr Date: 19-Dec-2012 18:14:26

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/L	Flags
* 1 1,4-Difluorobenzene	114	4.501	4.501	0.0	95	620277	25.0	
* 2 Chlorobenzene-d5	117	6.709	6.709	0.0	86	558306	25.0	
* 3 1,4-Dichlorobenzene-d4	152	8.563	8.563	0.0	95	267695	25.0	
$ 4 1,2-Dichloroethane-d4 (Surr)	65	4.190	4.190	0.0	0	251720	29.3	
$ 6 Toluene-d8 (Surr)	98	5.589	5.589	0.0	91	735906	29.1	
$ 7 4-Bromofluorobenzene (Surr)	174	7.641	7.641	0.0	89	222493	29.7	
11 Dichlorodifluoromethane	85	0.936	0.936	0.0	87	125307	22.4	
13 Chloromethane	50	1.061	1.061	0.0	89	169840	22.1	
14 Vinyl chloride	62	1.133	1.133	0.0	84	165276	21.6	
15 Bromomethane	94	1.372	1.372	0.0	93	88559	21.2	
16 Chloroethane	64	1.444	1.444	0.0	94	103272	21.1	
17 Trichlorofluoromethane	101	1.620	1.620	0.0	82	213521	28.0	
21 Acrolein	56	2.014	2.014	0.0	97	480430	391.1	
20 1,1,2-Trichloro-1,2,2-trifluoroe	101	2.045	2.045	0.0	87	143435	26.7	
22 1,1-Dichloroethene	96	2.045	2.045	0.0	87	146569	26.4	
23 Acetone	43	2.169	2.169	0.0	98	256617	105.8	
24 Iodomethane	142	2.190	2.190	0.0	99	174762	24.3	
25 Carbon disulfide	76	2.201	2.201	0.0	100	376113	20.2	
28 Methyl acetate	43	2.439	2.439	0.0	96	185839	23.0	
29 Acetonitrile	40	2.449	2.449	0.0	99	561915	1013.2	
30 Methylene Chloride	84	2.501	2.501	0.0	88	174853	23.1	
32 trans-1,2-Dichloroethene	96	2.698	2.698	0.0	94	169487	24.7	
33 Methyl tert-butyl ether	73	2.708	2.708	0.0	93	535657	22.8	
34 Acrylonitrile	53	2.781	2.781	0.0	98	392653	120.8	
36 1,1-Dichloroethane	63	3.071	3.071	0.0	86	300998	23.5	
39 Vinyl acetate	43	3.144	3.144	0.0	98	1907777	117.1	
42 2,2-Dichloropropane	77	3.517	3.517	0.0	91	130530	23.4	
43 cis-1,2-Dichloroethene	96	3.548	3.548	0.0	80	181049	23.3	
44 2-Butanone (MEK)	43	3.600	3.600	0.0	100	534897	119.3	

OK

$RRF_{MEK} = \frac{534897}{620277} \times \frac{25}{125} = 0.1725$ OK

$\%D = \frac{.1725 - .18065}{.18065} = -4.52$

CCAL - VOC

Report Date: 19-Dec-2012 18:14:26 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5975T\20121219-17709.b\T4525.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/L	Flags
47 Chlorobromomethane	128	3.745	3.745	0.0	92	92760	24.1	
48 Tetrahydrofuran	42	3.765	3.765	0.0	86	313414	110.8	
50 Chloroform	83	3.807	3.807	0.0	82	324847	25.9	
52 Cyclohexane	56	3.890	3.890	0.0	92	272352	22.8	
51 1,1,1-Trichloroethane	97	3.900	3.900	0.0	90	262246	27.1	
53 Carbon tetrachloride	117	4.004	4.004	0.0	87	225768	28.6	
54 1,1-Dichloropropene	75	4.014	4.014	0.0	88	225477	23.9	
55 Benzene	78	4.190	4.190	0.0	95	670700	22.9	
57 1,2-Dichloroethane	62	4.242	4.242	0.0	91	277426	27.2	
60 Trichloroethene	95	4.677	4.677	0.0	93	187159	25.7	
62 Methylcyclohexane	83	4.760	4.760	0.0	94	283109	24.0	
63 1,2-Dichloropropane	63	4.864	4.864	0.0	87	178206	23.3	
65 Dibromomethane	93	4.968	4.968	0.0	86	127918	26.1	
67 Dichlorobromomethane	83	5.092	5.092	0.0	91	237350	25.6	
69 2-Chloroethyl vinyl ether	63	5.320	5.320	0.0	92	671710	113.0	
71 cis-1,3-Dichloropropene	75	5.423	5.423	0.0	85	270827	23.6	
72 4-Methyl-2-pentanone (MIBK)	43	5.548	5.548	0.0	97	1166972	117.8	
73 Toluene	92	5.641	5.641	0.0	96	445265	23.7	
75 trans-1,3-Dichloropropene	75	5.859	5.859	0.0	98	257707	22.1	
77 Ethyl methacrylate	69	5.900	5.900	0.0	88	250254	21.9	
78 1,1,2-Trichloroethane	83	6.004	6.004	0.0	89	148959	24.8	
79 Tetrachloroethene	166	6.035	6.035	0.0	87	184434	26.4	
80 1,3-Dichloropropane	76	6.118	6.118	0.0	93	294109	24.2	
81 2-Hexanone	43	6.190	6.190	0.0	96	872623	123.5	
82 Chlorodibromomethane	129	6.294	6.294	0.0	90	177161	23.8	
83 Ethylene Dibromide	107	6.367	6.367	0.0	98	185937	25.7	
86 Chlorobenzene	112	6.729	6.729	0.0	89	502488	25.2	
89 1,1,1,2-Tetrachloroethane	131	6.802	6.802	0.0	40	163023	24.7	
88 Ethylbenzene	91	6.802	6.802	0.0	99	868996	24.9	
90 m-Xylene & p-Xylene	106	6.885	6.885	0.0	99	685355	51.6	
91 o-Xylene	106	7.206	7.206	0.0	98	319199	24.0	
92 Styrene	104	7.227	7.227	0.0	95	556571	24.5	
93 Bromoform	173	7.403	7.403	0.0	94	111058	24.2	
95 Isopropylbenzene	105	7.486	7.486	0.0	96	863944	26.4	
97 Bromobenzene	156	7.755	7.755	0.0	97	204823	26.1	
98 1,1,2,2-Tetrachloroethane	83	7.797	7.797	0.0	88	251403	25.4	
99 N-Propylbenzene	91	7.817	7.817	0.0	99	1058686	26.7	
100 1,2,3-Trichloropropane	110	7.828	7.828	0.0	74	85817	28.1	
101 trans-1,4-Dichloro-2-butene	53	7.838	7.838	0.0	87	346226	146.5	
105 2-Chlorotoluene	126	7.900	7.900	0.0	95	197302	26.2	
104 1,3,5-Trimethylbenzene	105	7.962	7.962	0.0	95	710781	26.9	
102 4-Chlorotoluene	91	7.994	7.994	0.0	98	716711	26.1	
106 tert-Butylbenzene	134	8.222	8.222	0.0	92	142651	26.8	
107 1,2,4-Trimethylbenzene	105	8.263	8.263	0.0	97	709438	26.5	
109 sec-Butylbenzene	105	8.398	8.398	0.0	95	866654	26.3	
110 1,3-Dichlorobenzene	146	8.501	8.501	0.0	95	390784	26.6	
111 4-Isopropyltoluene	119	8.522	8.522	0.0	97	723103	27.1	
113 1,4-Dichlorobenzene	146	8.584	8.584	0.0	94	402724	26.4	
115 n-Butylbenzene	91	8.854	8.854	0.0	97	673220	27.0	
116 1,2-Dichlorobenzene	146	8.885	8.885	0.0	94	367815	26.6	
117 1,2-Dibromo-3-Chloropropane	75	9.558	9.558	0.0	75	42794	28.3	
119 1,2,4-Trichlorobenzene	180	10.201	10.201	0.0	89	198654	25.9	

JR 2/19/13

$RRF_{Ethylbenzene} = \frac{868996}{558306} \times \frac{25}{25} = 1.556$ $\%D = \frac{1.556 - 1.56098}{1.56098} = -0.29\%$

$RRF_{1,2,4-TCB} = \frac{198654}{267695} \times \frac{25}{25} = 0.7421$ $\%D = \frac{.7421 - .7153}{.7153} = 3.7\%$ ok

Method Blank - VOC

Report Date: 19-Dec-2012 20:32:00 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5975T\20121219-17709.b\T4530.D		
Lims ID:	MB	Client ID:	
Inject. Date:	19-Dec-2012 20:03:30	Dil. Factor:	1.0000
Sample Type:	MB		
Sample ID:	MB		
Misc. Info.:	480-0017709-007		
Operator:	RAL	Instrument ID:	HP5975T
Purge Vol:	5.000 mL	ALS Bottle#:	32
Lims Batch ID:	96661	Lims Sample ID:	7
Detector:	MS SCAN		

Method:	\\Bufchrom\ChromData\HP5975T\20121219-17709.b\T-8260.m		
Last Update:	19-Dec-2012 20:31:57	Calib Date:	03-Dec-2012 21:04:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5975T\20121203-17185.b\T3875.D		
Limit Group:	MV - 8260MCP_RCP		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	ZB-624	Column Dia:	0.25 mm
Process Host:	XAWRK011		

First Level Reviewer: larsonr Date: 19-Dec-2012 20:31:57

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/L	Flags
* 1 1,4-Difluorobenzene	114	4.501	4.501	0.0	95	619491	25.0	
* 2 Chlorobenzene-d5	117	6.709	6.709	0.0	85	567081	25.0	
* 3 1,4-Dichlorobenzene-d4	152	8.564	8.564	0.0	97	253844	25.0	
$ 4 1,2-Dichloroethane-d4 (Surr)	65	4.190	4.190	0.0	0	266586	31.0	
$ 6 Toluene-d8 (Surr)	98	5.589	5.589	0.0	94	746339	29.0	
$ 7 4-Bromofluorobenzene (Surr)	174	7.641	7.641	0.0	87	212075	27.9	
136 Nitrobenzene	77		0.000					
135 Hexachloroethane	117		0.000					
142 Ethyl acrylate	1		0.000					
138 cis-1,4-Dichloro-2-butene	88		0.000					
137 Methyl acrylate	1		0.000					
11 Dichlorodifluoromethane	85		0.936					
12 Chlorodifluoromethane	51		0.957					
13 Chloromethane	50		1.061					
14 Vinyl chloride	62		1.133					
15 Bromomethane	94		1.372					
16 Chloroethane	64		1.444					
18 Dichlorofluoromethane	67		1.610					
17 Trichlorofluoromethane	101		1.620					
19 Ethyl ether	59		1.859					
84 Propene oxide	58		1.931					
21 Acrolein	56		2.014					
20 1,1,2-Trichloro-1,2,2-trifluoroe	101		2.045					
22 1,1-Dichloroethene	96		2.045					
23 Acetone	43		2.169					
24 Iodomethane	142		2.190					
25 Carbon disulfide	76		2.201					
26 Isopropyl alcohol	45		2.356					
27 3-Chloro-1-propene	41		2.377					
28 Methyl acetate	43		2.439					

$$\text{Conc}_{d_8\text{-toluene}} = \frac{746339}{567081} \times \frac{25}{1.1342} = 29 \frac{ug}{L}$$

OK

$$\%R = \frac{29}{25} = 116\%$$ OK

JM 2/19/13

LCS - VOC

Report Date: 19-Dec-2012 20:21:58 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5975T\20121219-17709.b\T4527.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/L	Flags
34 Acrylonitrile	53	2.771	2.781	-0.010	99	390313	117.6	
35 Hexane	57	2.874	2.874	0.0	94	291108	0	
36 1,1-Dichloroethane	63	3.071	3.071	0.0	85	313157	23.9	
37 Isopropyl ether	45	3.102	3.102	0.0	92	611011	24.3	
38 2-Chloro-1,3-butadiene	53	3.123	3.123	0.0	90	316543	0	
139 Halothane	117	3.123	3.123	0.0	0	103064	26.7	
39 Vinyl acetate	43	3.134	3.144	-0.010	98	2177713	130.8	
40 1,1-Dimethoxyethane	75	3.165	3.175	-0.010	62	237127	0	
41 Tert-butyl ethyl ether	59	3.393	3.392	0.001	98	632181	24.3	
42 2,2-Dichloropropane	77	3.517	3.517	0.0	92	144537	25.3	
43 cis-1,2-Dichloroethene	96	3.538	3.548	-0.010	68	190701	24.1	
44 2-Butanone (MEK)	43	3.600	3.600	0.0	99	740167	161.6	
45 Ethyl acetate	43	3.600	3.631	-0.031	51	739620	0	
46 Propionitrile	54	3.693	3.693	0.0	99	327714	225.6	
47 Chlorobromomethane	128	3.735	3.745	-0.010	89	96302	24.5	
48 Tetrahydrofuran	42	3.766	3.765	0.001	76	336497	116.4	
49 Methacrylonitrile	41	3.766	3.776	-0.010	84	329580	0	
50 Chloroform	83	3.807	3.807	0.0	82	333328	26.0	
52 Cyclohexane	56	3.890	3.890	0.0	94	292344	24.0	
51 1,1,1-Trichloroethane	97	3.890	3.900	-0.010	92	285176	28.8	
53 Carbon tetrachloride	117	4.004	4.004	0.0	79	243422	30.1	
54 1,1-Dichloropropene	75	4.014	4.014	0.0	89	244789	25.3	
55 Benzene	78	4.180	4.190	-0.010	96	694729	23.2	
57 1,2-Dichloroethane	62	4.242	4.242	0.0	91	282332	27.1	
56 Isobutyl alcohol	43	4.242	4.242	0.0	91	687016	0	
58 Tert-amyl methyl ether	73	4.263	4.263	0.0	91	572043	23.6	
59 n-Heptane	43	4.336	4.335	0.001	90	309424	31.1	
141 2,4,4-Trimethyl-1-pentene	55	4.584	4.584	0.0	0	139359	26.6	
60 Trichloroethene	95	4.667	4.677	-0.010	93	200773	27.0	
61 n-Butanol	56	4.729	4.729	0.0	91	435189	0	
62 Methylcyclohexane	83	4.761	4.760	0.0	95	314162	26.0	
140 2,4,4-Trimethyl-2-pentene	97	4.781	4.781	0.0	0	429566	30.3	
63 1,2-Dichloropropane	63	4.864	4.864	0.0	89	185996	23.8	
65 Dibromomethane	93	4.968	4.968	0.0	87	126515	25.3	
64 Methyl methacrylate	41	4.968	4.968	0.0	90	204824	23.8	
66 1,4-Dioxane	88	4.999	4.999	0.0	90	91441	979.7	
67 Dichlorobromomethane	83	5.092	5.092	0.0	97	243805	25.7	
68 2-Nitropropane	43	5.320	5.310	0.010	96	758593	265.6	
69 2-Chloroethyl vinyl ether	63	5.320	5.320	0.0	93	704401	116.0	
70 Epichlorohydrin	57	5.393	5.393	0.001	99	549651	0	
71 cis-1,3-Dichloropropene	75	5.424	5.423	0.001	85	294811	25.2	
72 4-Methyl-2-pentanone (MIBK)	43	5.548	5.548	0.0	97	1181229	115.3	
73 Toluene	92	5.641	5.641	0.0	98	476966	24.5	
75 trans-1,3-Dichloropropene	75	5.859	5.859	0.0	93	262256	21.7	
77 Ethyl methacrylate	69	5.900	5.900	0.0	89	252202	21.3	
78 1,1,2-Trichloroethane	83	6.004	6.004	0.0	89	145843	23.5	
79 Tetrachloroethene	166	6.035	6.035	0.0	85	211877	29.3	
80 1,3-Dichloropropane	76	6.118	6.118	0.0	94	286787	22.8	
81 2-Hexanone	43	6.180	6.190	-0.010	97	833084	114.0	
82 Chlorodibromomethane	129	6.294	6.294	0.0	90	183027	23.8	
83 Ethylene Dibromide	107	6.367	6.367	0.0	96	190439	25.5	
85 3-Chlorobenzotrifluoride	180	6.709	6.709	0.0	87	292026	0	

JW 2/19/13

Conc MEK = $\frac{740167}{633745} \times \frac{25}{.1807} = 161.58 \frac{ug}{L}$ $\quad$ % rec = $\frac{161.58}{125} = 129\%$

Sample — VOC

Report Date: 20-Dec-2012 11:27:24 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5975T\20121219-17709.b\T4549.D		
Lims ID:	480-30497-H-3	Client ID:	OC-SW-SD-1-XXX
Inject. Date:	20-Dec-2012 03:53:30	Dil. Factor:	1.0000
Sample Type:	Client		
Sample ID:	480-30497-H-3		
Misc. Info.:	480-0017709-027		
Operator:	RAL	Instrument ID:	HP5975T
Purge Vol:	5.000 mL	ALS Bottle#:	19
Lims Batch ID:	96661	Lims Sample ID:	27
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5975T\20121219-17709.b\T-8260.m		
Last Update:	20-Dec-2012 11:27:23	Calib Date:	03-Dec-2012 21:04:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5975T\20121203-17185.b\T3875.D		
Limit Group:	MV - 8260MCP_RCP		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	ZB-624	Column Dia:	0.25 mm
Process Host:	XAWRK037		

First Level Reviewer: HillL Date: 20-Dec-2012 11:27:23

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/L	Flags
* 1 1,4-Difluorobenzene	114	4.501	4.501	0.0	95	582635	25.0	
* 2 Chlorobenzene-d5	117	6.709	6.709	0.0	87	544655	25.0	
* 3 1,4-Dichlorobenzene-d4	152	8.564	8.564	0.0	97	242679	25.0	
$ 4 1,2-Dichloroethane-d4 (Surr)	65	4.190	4.190	0.0	0	258752	32.0	
$ 6 Toluene-d8 (Surr)	98	5.589	5.589	0.0	94	699826	28.3	
$ 7 4-Bromofluorobenzene (Surr)	174	7.641	7.641	0.0	89	208091	28.5	
11 Dichlorodifluoromethane	85		0.936					
13 Chloromethane	50		1.061					
14 Vinyl chloride	62		1.133					
15 Bromomethane	94		1.372					9
16 Chloroethane	64		1.444					
17 Trichlorofluoromethane	101		1.620					
19 Ethyl ether	59		1.859					
20 1,1,2-Trichloro-1,2,2-trifluoroe	101		2.045					
22 1,1-Dichloroethene	96		2.045					
23 Acetone	43	2.170	2.169	0.001	88	28394	12.5	
25 Carbon disulfide	76		2.201					
28 Methyl acetate	43		2.439					
30 Methylene Chloride	84		2.501					
32 trans-1,2-Dichloroethene	96		2.698					
33 Methyl tert-butyl ether	73		2.708					
36 1,1-Dichloroethane	63		3.071					
37 Isopropyl ether	45		3.102					
41 Tert-butyl ethyl ether	59		3.392					
42 2,2-Dichloropropane	77		3.517					9
43 cis-1,2-Dichloroethene	96		3.548					
44 2-Butanone (MEK)	43	3.610	3.600	0.010	99	103200	24.5	
47 Chlorobromomethane	128		3.745					
48 Tetrahydrofuran	42		3.765					
50 Chloroform	83		3.807					

Conc d8-toluene $= \frac{699826}{544655} \times \frac{25}{1.1342} = 28.32 \frac{ug}{L}$ OK

Surrec $= \frac{28.32}{25} = 113\%$ OK

Conc MEK $= \frac{103200}{582635} \times \frac{25}{.1807} = 24.5 \frac{ug}{L}$ OK

gr 2/19/13

DFTPP-SVOC

Report Date: 28-Dec-2012 11:52:53 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121228-17911.b\X3359.D\X-8270LL.rslt\spectra.d
Injection Date: 28-Dec-2012 11:05:30
Spectrum: Tune Spec: Scans 766-768(7.17-7.18) Bgrd 762(7.15)
Base Peak: 198.00
Minimum % Base Peak: 0
Number of Points: 346

m/z	Y	m/z	Y	m/z	Y	m/z	Y
78.00	34296	170.00	3875	260.00	1581	361.00	534
79.00	42568	171.00	3673	261.00	536	363.00	249
80.00	31816	172.00	9881	262.00	168	365.00	39272
81.00	45232	173.00	11119	263.00	553	366.00	3709
82.00	9082	174.00	16051	264.00	617	371.00	1147
83.00	8985	175.00	27240	265.00	17208	372.00	17056
85.00	8213	176.00	5878	266.00	5873	373.00	2841
86.00	14596	177.00	16392	267.00	926	374.00	273
87.00	6115	178.00	2957	268.00	1235	378.00	460
88.00	2133	179.00	52472	269.00	562	383.00	2533
89.00	1269	180.00	34464	270.00	830	384.00	2414
91.00	10030	181.00	15578	271.00	2223	387.00	439
92.00	8957	182.00	1775	272.00	2755	389.00	170
93.00	73224	183.00	297	273.00	18408	390.00	3883
94.00	6167	184.00	5401	274.00	60472	391.00	1934
95.00	1699	185.00	25176	275.00	284544	392.00	1315
96.00	1597	186.00	173696	276.00	34256	395.00	280
98.00	59664	187.00	52904	277.00	26776	397.00	306
99.00	39712	188.00	5829	278.00	3710	398.00	287
100.00	3891	189.00	14543	279.00	227	401.00	379
101.00	22024	190.00	1802	280.00	522	402.00	5692
102.00	1227	191.00	6649	282.00	949	403.00	7234
103.00	8056	192.00	17032	283.00	3604	404.00	3319
104.00	16736	193.00	16190	284.00	2438	405.00	225
105.00	14526	194.00	4517	285.00	4833	409.00	342
106.00	2747	195.00	2430	286.00	350	410.00	218
107.00	178752	196.00	30784	287.00	426	415.00	535
108.00	27216	198.00	1117184	288.00	330	416.00	413
110.00	299200	199.00	77848	289.00	1097	418.00	301
111.00	50360	200.00	7031	290.00	719	421.00	7115
112.00	5671	201.00	3842	291.00	307	422.00	5033
113.00	2514	202.00	2093	292.00	837	423.00	48240
114.00	727	203.00	9474	293.00	5520	424.00	11760
115.00	1439	204.00	45288	294.00	1483	425.00	1733

m/z $\frac{199}{198} = \frac{77848}{1117184} = 6.97$ OK

gr 2/19/13

DFTPP - SWL

Report Date: 28-Dec-2012 11:52:53 Chrom Revision: 2.0 22-Oct-2012 16:30:48

Data File: \\Bufchrom\ChromData\HP5973X\20121228-17911.b\X3359.D\X-8270LL.rslt\spectra.d
Injection Date: 28-Dec-2012 11:05:30
Spectrum: Tune Spec: Scans 766-768(7.17-7.18) Bgrd 762(7.15)
Base Peak: 198.00
Minimum % Base Peak: 0
Number of Points: 346

m/z	Y	m/z	Y	m/z	Y	m/z	Y
35.00	261	137.00	10106	225.00	42040	317.00	1176
36.00	762	138.00	1940	226.00	5899	319.00	904
37.00	2976	139.00	626	227.00	85720	320.00	312
38.00	8161	140.00	3492	228.00	10169	321.00	1681
39.00	37120	141.00	34128	229.00	14019	322.00	1483
40.00	1761	142.00	10770	230.00	3381	323.00	27568
42.00	530	143.00	8692	231.00	5111	324.00	5934
47.00	274	144.00	1542	232.00	1847	325.00	363
50.00	149568	145.00	2048	233.00	786	326.00	846
51.00	557248	146.00	5296	234.00	4733	327.00	6181
52.00	26744	147.00	18168	235.00	6697	328.00	2715
53.00	1578	148.00	40480	236.00	4020	331.00	343
55.00	1971	149.00	5350	237.00	4823	332.00	3290
56.00	14989	150.00	2182	238.00	1396	333.00	2830
57.00	33760	151.00	3640	239.00	3765	334.00	14194
58.00	1187	152.00	2807	240.00	2332	335.00	3814
59.00	816	153.00	12069	241.00	5329	336.00	216
60.00	237	154.00	8365	242.00	9038	339.00	289
61.00	5899	155.00	20792	243.00	9697	340.00	1812
62.00	6769	156.00	29744	244.00	121072	341.00	535
63.00	23880	157.00	4380	245.00	20376	342.00	219
64.00	3982	158.00	7887	246.00	27264	343.00	256
65.00	7011	159.00	2840	247.00	4683	345.00	1714
66.00	497	160.00	13601	249.00	4095	346.00	3083
67.00	393	161.00	17936	250.00	840	347.00	370
68.00	1955	162.00	4489	251.00	1430	351.00	627
69.00	447552	163.00	2468	252.00	3362	352.00	10355
70.00	1647	164.00	2121	253.00	3431	353.00	5969
73.00	4209	165.00	15840	255.00	662848	354.00	10973
74.00	53424	166.00	8769	256.00	98952	355.00	896
75.00	74824	167.00	65096	257.00	9080	357.00	186
76.00	26040	168.00	31368	258.00	43632	359.00	782
77.00	485632	169.00	6707	259.00	4953	360.00	959

m/z $\frac{51}{198} = \frac{557248}{1117184} = 49.88$ OK

gr 2/19/13

FORM VI
GC/MS SEMI VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1 Analy Batch No.: 96347

SDG No.:

Instrument ID: HP5973X GC Column: RXI-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/18/2012 11:20 Calibration End Date: 12/18/2012 14:44 Calibration ID: 11641

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Hexachlorocyclopentadiene	0.2055	0.1874	0.0652 0.2168	0.1030 0.2176	0.1285	QuaF		0.1581	0.0032		0.0500				0.9900		0.9900
1,2,4,5-Tetrachlorobenzene	0.4823	0.3762 0.4675	0.4871 0.4933	0.5467 0.4705	0.4292	Ave		0.4691			0.0100	11.0		20.0			
2,4,6-Trichlorophenol	0.3242	0.2364 0.3093	0.2627 0.3161	0.2925 0.2983	0.2705	Ave		0.2887			0.2000	10.0		20.0			
2,4,5-Trichlorophenol	0.2965	0.2991 0.2843	0.2284 0.2991	0.2939 0.2961	0.2370	Ave		0.2793			0.2000	10.0		20.0			
1,1'-Biphenyl	1.5166	1.4303 1.4888	1.4108 1.4543	1.5191 1.3495	1.3953	Ave		1.4456			0.0100	4.2		30.0			
2-Chloronaphthalene	1.1165	2.3588 1.0884	1.5770 1.1220	1.2997 1.0545	1.1518	Lin1	0.6190	1.0411			0.8000				0.9990		0.9900
Phenyl ether	0.7899	0.7785 0.8072	0.7491 0.7911	0.8294 0.7705	0.7737	Ave		0.7862				3.1		20.0			
2-Nitroaniline	0.3730	0.2955 0.3802	0.2321 0.3895	0.2872 0.3902	0.3015	Ave		0.3311			0.0100	18.0		20.0			
Dimethyl phthalate	1.3521	1.1892 1.3445	1.2515 1.3330	1.3686 1.2838	1.2285	Ave		1.2939			0.0100	5.1		20.0			
2,6-Dinitrotoluene	0.6372	0.4403 0.6256	0.5758 0.6322	0.5890 0.6271	0.5652	Ave		0.5865			0.1000	11.0		20.0			
Acenaphthylene	1.7831	1.7975 1.7740	1.8114 1.7432	1.8577 1.5943	1.6305	Ave		1.7489			0.9000	5.2		20.0			
3-Nitroaniline	0.3249	0.3162	0.2009 0.3472	0.3008 0.3158	0.2334	Ave		0.2913			0.0100	18.0		20.0			
Acenaphthene	1.6440 1.1655	1.2341 1.1730	1.1911 1.1505	1.2142 1.0920	1.0960	Ave		1.2178			0.8000	14.0		20.0			
2,4-Dinitrophenol	0.1390	0.1206	0.0381 0.1419	0.0721 0.1694	0.1014	QuaF		0.0845	0.0021		0.0500				0.9950		0.9900
Dibenzofuran	0.8975 1.5978	1.5941 1.6129	1.5079 1.5539	1.6313 1.4556	1.5187	Ave		1.4855			0.8000	15.0		20.0			
2,4-Dinitrotoluene	0.4263	0.2793 0.3985	0.3821 0.4305	0.3300 0.4160	0.3324	Ave		0.3744			0.2000	15.0		20.0			
4-Nitrophenol	0.2843	0.2750	0.1710 0.2953	0.2357 0.2830	0.2075	Ave		0.2503			0.0500	19.0		20.0			
2,3,4,6-Tetrachlorophenol	0.2711	0.1610 0.2430	0.2472 0.2084	0.2766 0.2102	0.1800	Ave		0.2247			0.0100	19.0		30.0			
Diethyl phthalate	1.4600	1.3432 1.4397	1.4998 1.4111	1.5083 1.3114	1.3609	Ave		1.4168			0.0100	5.2		20.0			
Fluorene	1.4314	1.3086 1.3712	1.3591 1.3621	1.4320 1.2830	1.3218	Ave		1.3586			0.8000	4.0		20.0			

$\overline{RRF}$ Acenaphthene = 1.2178

RRF Acenaphthene = $\frac{124892}{524288} \times \frac{5}{1}$ = 1.19106

OK

S.(RSD) = .166797 / Acenaphthene 1.2178 = 13.7 OK

(14.0 reported; rounding error)

TRAL - SWC

Note: The ml coefficient is the same as Ave RRF for an Ave curve type.

FORM VI 8270D

2/19/13

FORM VI
GC/MS SEMI VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1 Analy Batch No.: 96347

SDG No.:

Instrument ID: HP5973X GC Column: RXI-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/18/2012 11:20 Calibration End Date: 12/18/2012 14:44 Calibration ID: 11641

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
4-Chlorophenyl phenyl ether	0.6025	0.5804 0.6334	0.6402 0.6023	0.5785 0.5843	0.5921	Ave		0.6017			0.4000	3.9		20.0			
4-Nitroaniline	0.3293	0.0116 0.3263	0.2764 0.3413	0.2853 0.3266	0.2623	Lin1	-0.139	0.3381			0.0100				0.9960		0.9900
4,6-Dinitro-2-methylphenol	0.2297	0.0847 0.2113	0.1009 0.2284	0.1276 0.2272	0.1752	Lin1	-0.224	0.2283			0.0100				0.9920		0.9900
Diphenylamine	0.8148 1.2530	1.1180 1.2436	1.1744 1.2447	1.3298 1.1004	1.1936	Ave		1.1636				13.0		30.0			
N-Nitrosodiphenylamine	0.8073 1.2530	1.1180 1.2436	1.1744 1.2447	1.3298 1.1004	1.1936	Ave		1.1627			0.0100	13.0		20.0			
1,2-Diphenylhydrazine	0.8239	0.6533 0.7937	0.5700 0.8862	0.7848 0.7821	0.7182	Ave		0.7515				13.0		30.0			
Azobenzene	0.8239	0.6408 0.7937	0.5700 0.8862	0.7848 0.7821	0.7182	Ave		0.7500				14.0		20.0			
Benzophenone	1.2173	1.3620 1.2576	1.1096 1.1433	1.3187 1.0671	1.0371	Ave		1.1891				10.0		20.0			
4-Bromophenyl phenyl ether	0.2002	0.1812 0.1882	0.1668 0.2019	0.1956 0.1979	0.1676	Ave		0.1874			0.1000	7.6		20.0			
Hexachlorobenzene	0.0914 0.2037	0.1411 0.1882	0.1769 0.2048	0.2113 0.1960	0.1909	Lin1	-0.013	0.1991			0.1000				0.9980		0.9900
Atrazine	0.3913	0.3743 0.3902	0.3615 0.3736	0.3838 +++++	0.3579	Ave		0.3761			0.0100	3.5		20.0			
Pentachloronitrobenzene	0.1105	0.0525 0.1074	0.0599 0.1106	0.0823 0.1069	0.0928	Lin1	-0.040	0.1102							0.9970		0.9900
Pentachlorophenol	0.1012	0.0610 0.0925	0.0304 0.1057	0.0661 0.1009	0.0794	Lin1	-0.091	0.1020			0.0500				0.9900		0.9900
Phenanthrene	1.0661 1.1266	1.1412 1.1057	1.1507 1.1133	1.2468 0.9950	1.0855	Ave		1.1145			0.6000	6.1		20.0			
Anthracene	1.2584 1.1523	1.0912 1.1445	1.1347 1.1358	1.2202 0.9932	1.0862	Ave		1.1352			0.7000	6.8		20.0			
Carbazole	1.0886	1.0323 1.0810	0.9955 1.0885	1.1037 1.0063	1.0233	Ave		1.0524			0.0100	4.0		20.0			
Di-n-butyl phthalate	0.8812 1.2933	1.2706 1.3087	1.2352 1.2561	1.4167 1.0681	1.2495	Ave		1.2199			0.0100	13.0		20.0			
Fluoranthene	1.1417	0.9614 1.1293	1.1271 1.1437	1.2164 1.0060	1.1024	Ave		1.1035			0.6000	7.4		20.0			
Benzidine	0.5073	0.5032 0.6052	0.6502 0.4930	0.6240 +++++	0.4829	Ave		0.5523				13.0		20.0			
Pyrene	1.3636	1.4057 1.3997	1.3819 1.2855	1.3654 1.2162	1.2995	Ave		1.3397			0.6000	4.9		20.0			

RRF = 220154 / 956634 × 5/1
Phenanthrene = 1.15066
OK
RRF = 1.1145
%RSD = .0682 / 1.1145
= 6.1 OK

Note: The ml coefficient is the same as Ave RRF for an Ave curve type.

IRAL-SVOC

2/19/13

ICAL-SVOC

Report Date: 18-Dec-2012 16:43:03 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3133.D		
Lims ID:	IC - 1.0	Client ID:	
Inject. Date:	18-Dec-2012 12:11:30	Dil. Factor:	1.0000
Sample Type:	IC	Calib Level:	3
Sample ID:	480-0017654-004		
Misc. Info.:			
Operator:	ANM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	5
Lims Batch ID:	96347	Lims Sample ID:	4
Sublist:	chrom-X-8270LL*sub20		
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X-8270LL.m		
Last Update:	18-Dec-2012 16:43:02	Calib Date:	18-Dec-2012 14:44:30
Quant Method:	Internal Standard	Quant By:	Continuing Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3139.D		
Limit Group:	MB - 8270RCP_MCP ICAL		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Process Host:	XAWRK017		

First Level Reviewer: mckernar Date: 18-Dec-2012 16:43:02

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.580	6.594	-0.014	84	235486	5.00	
* 2 Naphthalene-d8	136	8.467	8.486	-0.019	98	842989	5.00	
* 3 Acenaphthene-d10	164	11.112	11.116	-0.004	88	524288	5.00	
* 4 Phenanthrene-d10	188	13.128	13.128	0.0	96	956639	5.00	
* 5 Chrysene-d12	240	15.767	15.767	0.0	97	825243	5.00	
* 6 Perylene-d12	264	17.047	17.051	-0.004	95	830996	5.00	
$ 7 2-Fluorophenol	112	4.687	4.701	-0.014	0	51938	0.9719	M
$ 8 Phenol-d5	99	6.118	6.118	0.0	78	67367	1.04	M
$ 9 Nitrobenzene-d5	82	7.416	7.435	-0.019	64	57504	0.9098	
$ 10 2-Fluorobiphenyl	172	10.127	10.127	0.0	86	131707	1.00	
$ 11 2,4,6-Tribromophenol	330	12.300	12.291	0.009	0	15302	0.8695	M
$ 12 p-Terphenyl-d14	244	14.807	14.802	0.005	90	141897	0.8918	
18 1,4-Dioxane	88	2.461	2.466	-0.005	51	25494	0.9192	M
19 N-Nitrosodimethylamine	42	2.818	2.813	0.005	56	41753	0.9705	M
20 Pyridine	52	2.908	2.908	0.0	1	30554	0.6994	M
21 Benzaldehyde	77	5.952	5.961	-0.009	80	47929	1.04	M
23 Aniline	93	6.113	6.128	-0.015	87	77634	0.9004	
(1) 22 Phenol	94	6.142	6.142	0.0	0	63116	0.8799	M
24 Bis(2-chloroethyl)ether	93	6.213	6.223	-0.010	86	53034	0.9391	
25 2-Chlorophenol	128	6.289	6.294	-0.005	81	55968	0.9178	M
26 1,3-Dichlorobenzene	146	6.494	6.503	-0.009	90	67570	0.8934	
27 1,4-Dichlorobenzene	146	6.603	6.622	-0.019	60	71304	0.9438	
29 1,2-Dichlorobenzene	146	6.822	6.841	-0.019	79	62406	0.8859	
28 Benzyl alcohol	108	6.889	6.846	0.043	20	14091	0.7958	M
32 2,2'-oxybis[1-chloropropane]	45	7.017	7.022	-0.005	67	88085	0.9595	M
31 2-Methylphenol	108	7.022	7.031	-0.009	40	45407	0.8871	M
33 Acetophenone	105	7.207	7.212	-0.005	76	79952	0.9155	M
34 N-Nitrosodi-n-propylamine	70	7.207	7.217	-0.010	77	35043	0.7989	
36 4-Methylphenol	108	7.312	7.288	0.024	0	57517	1.11	M

JR 2/19/13

$RRF_{Phenol} = \frac{63116}{235486} \times \frac{5}{1} = 1.3401$ OK

$\%RSD = \frac{.169078}{1.523075} = 11.1$ OK

$\overline{RRF} = (1.2105 + 1.3401 + 1.6689 + 1.4788 + 1.6176 + 1.5984 + 1.6898 + 1.5805)/8 = 1.523$ OK

IRAL – SVOC

Report Date: 18-Dec-2012 16:43:03 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3133.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
37 Hexachloroethane	117	7.307	7.331	-0.024	79	26747	0.8385	
38 Nitrobenzene	77	7.455	7.464	-0.009	75	55225	0.8417	
40 Isophorone	82	7.806	7.821	-0.015	71	90545	0.8391	
41 2-Nitrophenol	139	7.930	7.939	-0.009	56	27016	0.9049	M
43 2,4-Dimethylphenol	107	8.063	8.058	0.005	0	56555	1.00	M
45 Bis(2-chloroethoxy)methane	93	8.182	8.177	0.005	75	68136	1.07	M
44 Benzoic acid	105		8.268					
47 2,4-Dichlorophenol	162	8.382	8.358	0.024	0	41301	0.9012	M
48 1,2,4-Trichlorobenzene	180	8.396	8.410	-0.014	87	52870	0.9385	
(2) 49 Naphthalene	128	8.501	8.520	-0.019	80	198868	1.06	
51 4-Chloroaniline	127	8.672	8.662	0.010	71	48018	0.7107	
52 Hexachlorobutadiene	225	8.696	8.710	-0.014	71	29942	0.9727	
54 Caprolactam	113	9.276	9.209	0.067	42	13444	0.8060	M
55 4-Chloro-3-methylphenol	107	9.518	9.466	0.052	1	41948	0.8285	M
56 2-Methylnaphthalene	142	9.561	9.566	-0.005	69	135097	1.03	
57 1-Methylnaphthalene	142	9.699	9.709	-0.010	86	129919	1.08	
58 Hexachlorocyclopentadiene	237	9.785	9.794	-0.009	8	6833	0.4089	
59 1,2,4,5-Tetrachlorobenzene	216	9.818	9.818	0.0	78	51072	1.04	
60 2,4,6-Trichlorophenol	196	10.070	10.037	0.033	49	27547	0.9099	M
61 2,4,5-Trichlorophenol	196	10.208	10.146	0.062	1	23950	0.8178	M
62 1,1'-Biphenyl	154	10.270	10.274	-0.004	92	147932	0.9759	
63 2-Chloronaphthalene	162	10.317	10.317	0.0	84	165356	0.9202	M
64 Phenyl ether	170	10.441	10.436	0.005	88	78549	0.9529	
65 2-Nitroaniline	65	10.546	10.512	0.034	55	24342	0.7010	M
66 1,4-Dinitrobenzene	75	10.779	10.755	0.024	36	23696	0	M
67 Dimethyl phthalate	163	10.783	10.779	0.004	84	131233	0.9673	
68 2,6-Dinitrotoluene	165	10.879	10.864	0.015	82	60374	0.9816	
69 Acenaphthylene	152	10.902	10.907	-0.005	81	189943	1.04	
70 3-Nitroaniline	138	11.216	11.159	0.057	1	21070	0.6898	M
(3) 71 Acenaphthene	153	11.164	11.169	-0.005	83	124892	0.9780	
72 2,4-Dinitrophenol	184	11.383	11.349	0.034	0	7990	0.8823	M
73 Dibenzofuran	168	11.444	11.440	0.004	96	158117	1.02	
74 2,4-Dinitrotoluene	165	11.516	11.492	0.024	1	40061	1.02	M
75 4-Nitrophenol	109	11.687	11.611	0.076	1	35867	1.37	M
76 2,3,4,6-Tetrachlorophenol	232	11.687	11.668	0.019	37	25922	1.10	M
78 Diethyl phthalate	149	11.830	11.825	0.005	89	157267	1.06	M
79 Fluorene	166	11.944	11.934	0.010	82	142510	1.00	
80 4-Chlorophenyl phenyl ether	204	11.963	11.953	0.010	77	67135	1.06	
81 4-Nitroaniline	138	12.120	12.067	0.053	43	28981	1.23	M
82 4,6-Dinitro-2-methylphenol	198	12.105	12.082	0.023	47	21166	1.87	M
84 Diphenylamine	169	12.134	12.124	0.010	95	224688	1.01	
83 N-Nitrosodiphenylamine	169	12.134	12.124	0.010	95	224688	1.01	
16 1,2-Diphenylhydrazine	77	12.177	12.167	0.010	96	109056	0.7584	
85 Azobenzene	77	12.177	12.167	0.010	97	109056	0.7600	
86 Benzophenone	105	12.196	12.191	0.005	94	116350	0.9332	
89 4-Bromophenyl phenyl ether	248	12.600	12.595	0.005	73	31913	0.8900	
91 Hexachlorobenzene	284	12.662	12.652	0.010	61	33846	0.9560	
92 Simazine	201	12.814	12.809	0.005	68	10972	0	
93 Atrazine	200	12.838	12.838	0.0	77	75813	1.92	
95 Pentachloronitrobenzene	237	12.928	12.923	0.005	8	11461	0.9091	
94 Pentachlorophenol	266	12.961	12.933	0.028	1	11624	1.49	
(4) 97 Phenanthrene	178	13.156	13.156	0.0	80	220154	1.03	

$RRF_{Naphthalene}$ = 1.0433, 1.1736, 1.1795, 1.1537, 1.0933, 1.1148, 1.1246 + 1.0861 + .9997 / 9 = 1.1076 OK

$RRF_{Naphthalene} = \frac{198868}{542989} \times \frac{5}{1} = 1.1795$ OK

$\%RSD = \frac{.0596}{1.1076} = 5.38\%$ OK

JR 2/19/13

IRAL-SVOC

Report Date: 18-Dec-2012 16:43:03 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3133.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
98 Anthracene	178	13.223	13.218	0.005	90	217098	1.00	
99 Carbazole	167	13.442	13.427	0.015	96	190469	0.9459	M
101 Alachlor	160	13.565	13.565	0.0	82	36999	0	
102 Di-n-butyl phthalate	149	13.808	13.803	0.005	93	236333	1.01	
104 Fluoranthene	202	14.440	14.431	0.009	92	215639	1.02	
105 Benzidine	184	14.621	14.597	0.024	73	107316	1.18	M
106 Pyrene	202	14.659	14.654	0.005	97	228073	1.03	
107 Famphur	218	15.206	15.201	0.005	65	71908	0	
108 Butyl benzyl phthalate	149	15.244	15.244	0.0	86	114162	0.9336	
110 Bis(2-ethylhexyl) phthalate	149	15.739	15.734	0.005	94	160627	0.9542	
109 3,3'-Dichlorobenzidine	252	15.753	15.743	0.010	8	68680	0.9263	
111 Benzo[a]anthracene	228	15.763	15.753	0.010	57	161424	0.9080	
(5) 112 Chrysene	228	15.791	15.791	0.0	76	252184	1.25	
113 Di-n-octyl phthalate	149	16.276	16.271	0.005	96	281150	1.06	
114 Benzo[b]fluoranthene	252	16.704	16.695	0.010	77	174956	0.9066	
115 Benzo[k]fluoranthene	252	16.723	16.718	0.005	77	177253	0.8914	
116 Benzo[a]pyrene	252	17.008	17.004	0.004	0	174699	0.9362	M
118 Dibenz(a,h)anthracene	278	18.140	18.150	-0.010	0	129231	0.7645	M
(6) 117 Indeno[1,2,3-cd]pyrene	276	18.136	18.150	-0.014	91	167625	0.8416	M
119 Benzo[g,h,i]perylene	276	18.459	18.468	-0.009	72	168957	1.02	M
S 121 3-Methylphenol	1		0.000					

QC Flag Legend

Review Flags
M - Manually Integrated

$$RRF_{Chrysene} = \frac{252184}{825243} \times \frac{5}{1} = 1.5279 \quad \underline{OK}$$

$$\overline{RRF}_{Chrysene} = 1.22186 \quad \underline{OK}$$

$$\%RSD = \frac{.236187}{1.22186} \times 100\% = 19.3 \quad \underline{OK}$$

$$RRF_{Indeno(1,2,3-cd)pyrene} = \frac{167625}{830996} \times \frac{5}{1} = 1.00858 \quad \underline{OK}$$

$$\overline{RRF}_{Indeno(1,2,3\,cd)pyrene} = 1.19835 \quad \underline{OK}$$

$$\%RSD = \frac{.11297}{1.19835} = 9.43\% \quad \underline{OK}$$

JN 2/19/13

CCAL - SVOC

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1

SDG No.:

Lab Sample ID: CCVIS 480-97673/2 Calibration Date: 12/28/2012 11:21

Instrument ID: HP5973X Calib Start Date: 12/18/2012 11:20

GC Column: RXI-5Sil MS ID: 0.25(mm) Calib End Date: 12/18/2012 14:44

Lab File ID: X3360.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
N-Nitrosodimethylamine	Ave	0.9135	0.9892		8660	8000	8.3	20.0
Pyridine	Ave	0.9276	0.8851		7630	8000	-4.6	20.0
Benzaldehyde	Ave	0.9800	1.017	0.0100	8300	8000	3.7	20.0
Aniline	Ave	1.831	1.856		8110	8000	1.4	20.0
Phenol	Ave	1.523	1.486	0.7000	7810	8000	-2.4	20.0
Bis(2-chloroethyl)ether	Ave	1.199	1.152	0.6000	7680	8000	-4.0	20.0
2-Chlorophenol	Ave	1.295	1.297	0.8000	8010	8000	0.2	20.0
1,3-Dichlorobenzene	Ave	1.606	1.528		7610	8000	-4.8	20.0
1,4-Dichlorobenzene	Ave	1.604	1.594		7950	8000	-0.7	20.0
Benzyl alcohol	QuaF		0.4780		8190	8000	2.4	20.0
1,2-Dichlorobenzene	Ave	1.496	1.489		7960	8000	-0.5	20.0
2-Methylphenol	Ave	1.087	1.046	0.6000	7700	8000	-3.7	20.0
2,2'-oxybis[1-chloropropane]	Ave	1.949	1.915	0.0100	7860	8000	-1.7	20.0
Acetophenone	Ave	1.854	1.903	0.0100	8210	8000	2.7	20.0
N-Nitrosodi-n-propylamine	Ave	0.9313	0.9826	0.0500	8440	8000	5.5	20.0
4-Methylphenol	Ave	1.101	1.059	0.6000	7700	8000	-3.8	20.0
Hexachloroethane	Lin1		0.5914	0.3000	7430	8000	-7.2	20.0
Nitrobenzene	Ave	0.3891	0.4178	0.1000	8590	8000	7.4	20.0
Isophorone	Ave	0.6400	0.6507	0.3000	8130	8000	1.7	20.0
2-Nitrophenol	Ave	0.1771	0.1898	0.0500	8570	8000	7.2	20.0
2,4-Dimethylphenol	Ave	0.3340	0.3115	0.1000	7460	8000	-6.8	20.0
Bis(2-chloroethoxy)methane	Ave	0.3791	0.3670	0.2000	7740	8000	-3.2	20.0
Benzoic acid	QuaF		0.1915		8800	8000	10.1	20.0
2,4-Dichlorophenol	Ave	0.2718	0.3280	0.1000	9650	8000	20.7*	20.0
1,2,4-Trichlorobenzene	Ave	0.3341	0.3727		8920	8000	11.5	20.0
Naphthalene	Ave	1.108	1.055	0.6000	7620	8000	-4.8	20.0
4-Chloroaniline	Ave	0.4008	0.4100	0.0100	8180	8000	2.3	20.0
Hexachlorobutadiene J/UJ	Ave	0.1826	0.2372	0.0100	10400	8000	29.9*	20.0
Caprolactam	Ave	0.0989	0.0814	0.0100	6580	8000	-17.7	20.0
4-Chloro-3-methylphenol	Ave	0.3003	0.3080	0.2000	8200	8000	2.6	20.0
2-Methylnaphthalene	Ave	0.7764	0.7888	0.4000	8130	8000	1.6	20.0
1-Methylnaphthalene	Ave	0.7151	0.7303		8170	8000	2.1	20.0
Hexachlorocyclopentadiene	QuaF		0.2323	0.0500	9800	8000	22.5*	20.0
1,2,4,5-Tetrachlorobenzene	Ave	0.4691	0.5339	0.0100	9100	8000	13.8	20.0
2,4,6-Trichlorophenol J/UJ	Ave	0.2887	0.3670	0.2000	10200	8000	27.1*	20.0
2,4,5-Trichlorophenol	Ave	0.2793	0.3462	0.2000	9920	8000	23.9*	20.0
1,1'-Biphenyl	Ave	1.446	1.435	0.0100	7940	8000	-0.7	20.0
2-Chloronaphthalene	Lin1		1.151	0.8000	8250	8000	3.1	20.0
Phenyl ether	Ave	0.7862	0.8362		8510	8000	6.4	20.0
2-Nitroaniline	Ave	0.3311	0.3657	0.0100	8840	8000	10.4	20.0
Dimethyl phthalate	Ave	1.294	1.398	0.0100	8650	8000	8.1	20.0

FORM VII 8270D

2/14/13

CCAL-SVOC

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1

SDG No.:

Lab Sample ID: CCVIS 480-97673/2 Calibration Date: 12/28/2012 11:21

Instrument ID: HP5973X Calib Start Date: 12/18/2012 11:20

GC Column: RXI-5Sil MS ID: 0.25(mm) Calib End Date: 12/18/2012 14:44

Lab File ID: X3360.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
2,6-Dinitrotoluene	Ave	0.5865	0.6558	0.1000	8950	8000	11.8	20.0
Acenaphthylene	Ave	1.749	1.749	0.9000	8000	8000	-0.0	20.0
3-Nitroaniline	Ave	0.2913	0.2893	0.0100	7950	8000	-0.7	20.0
Acenaphthene	Ave	1.218	1.113	0.9000	7310	8000	-8.6	20.0
2,4-Dinitrophenol	QuaF		0.1533	0.0100	19600	16000	22.4*	20.0
Dibenzofuran	Ave	1.486	1.668	0.8000	8980	8000	12.3	20.0
2,4-Dinitrotoluene	Ave	0.3744	0.4460	0.2000	9530	8000	19.1	20.0
4-Nitrophenol	Ave	0.2503	0.2607	0.0500	16700	16000	4.2	20.0
2,3,4,6-Tetrachlorophenol J/UJ	Ave	0.2247	0.3277	0.0100	11700	8000	45.8*	20.0
Diethyl phthalate	Ave	1.417	1.409	0.0100	7960	8000	-0.5	20.0
Fluorene	Ave	1.359	1.417	0.8000	8340	8000	4.3	20.0
4-Chlorophenyl phenyl ether	Ave	0.6017	0.6920	0.4000	9200	8000	15.0	20.0
4-Nitroaniline	Lin1		0.3137	0.0100	7830	8000	-2.1	20.0
4,6-Dinitro-2-methylphenol	Lin1		0.2606	0.0100	19200	16000	20.3*	20.0
Diphenylamine	Ave	1.164	1.213		8340	8000	4.3	20.0
N-Nitrosodiphenylamine	Ave	1.163	1.213	0.0100	8350	8000	4.4	20.0
1,2-Diphenylhydrazine	Ave	0.7515	0.7789		8290	8000	3.6	20.0
Azobenzene	Ave	0.7500	0.7789		8310	8000	3.9	20.0
Benzophenone	Ave	1.189	1.041		7000	8000	-12.5	20.0
4-Bromophenyl phenyl ether	Ave	0.1874	0.2066	0.1000	8820	8000	10.2	20.0
Hexachlorobenzene	Lin1		0.2217	0.1000	8980	8000	12.2	20.0
Atrazine	Ave	0.3761	0.4323	0.0100	18400	16000	14.9	20.0
Pentachloronitrobenzene	Lin1		0.1239		9350	8000	16.9	20.0
Pentachlorophenol	Lin1		0.1149	0.0500	18900	16000	18.2	20.0
Phenanthrene	Ave	1.115	1.121	0.6000	8040	8000	0.5	20.0
Anthracene	Ave	1.135	1.142	0.6000	8050	8000	0.6	20.0
Carbazole	Ave	1.052	1.058	0.0100	8050	8000	0.6	20.0
Di-n-butyl phthalate	Ave	1.220	1.266	0.0100	8300	8000	3.7	20.0
Fluoranthene	Ave	1.104	1.236	0.6000	8960	8000	12.0	20.0
Benzidine J/UJ	Ave	0.5523	0.3765		5450	8000	-31.8*	20.0
Pyrene	Ave	1.340	1.286	0.6000	7680	8000	-4.0	20.0
Butyl benzyl phthalate	Ave	0.7409	0.6218	0.0100	6710	8000	-16.1	20.0
3,3'-Dichlorobenzidine	Ave	0.4492	0.4464	0.0100	7950	8000	-0.6	20.0
Bis(2-ethylhexyl) phthalate	Ave	1.020	0.8342	0.0100	6540	8000	-18.2	20.0
Benzo[a]anthracene	Ave	1.077	1.180	0.6000	8760	8000	9.5	20.0
Chrysene	Ave	1.222	1.100	0.6000	7200	8000	-10.0	20.0
Di-n-octyl phthalate	Ave	1.608	1.295	0.0100	6440	8000	-19.5	20.0
Benzo[b]fluoranthene	Ave	1.161	1.241	0.7000	8550	8000	6.9	20.0
Benzo[k]fluoranthene	Ave	1.196	1.279	0.7000	8550	8000	6.9	20.0
Benzo[a]pyrene	Ave	1.123	1.094	0.7000	7790	8000	-2.6	20.0
Dibenz(a,h)anthracene	Ave	1.017	0.9693	0.4000	7620	8000	-4.7	20.0

FORM VII 8270D

2/14/13

CCAL-SVOC

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1

SDG No.:

Lab Sample ID: CCVIS 480-97673/2 Calibration Date: 12/28/2012 11:21

Instrument ID: HP5973X Calib Start Date: 12/18/2012 11:20

GC Column: RXI-5Sil MS ID: 0.25(mm) Calib End Date: 12/18/2012 14:44

Lab File ID: X3360.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Indeno[1,2,3-cd]pyrene	Ave	1.198	1.211	0.5000	8080	8000	1.1	20.0
Benzo[g,h,i]perylene	Ave	1.000	0.9823	0.4000	7860	8000	-1.8	20.0
1,4-Dioxane	Lin1					8000	-100.0*	20.0
2-Fluorophenol	Ave	1.135	1.200		8460	8000	5.8	20.0
Phenol-d5	Ave	1.381	1.412		8180	8000	2.3	20.0
Nitrobenzene-d5	Ave	0.3749	0.3988		8510	8000	6.4	20.0
2-Fluorobiphenyl	Ave	1.255	1.356		8640	8000	8.0	20.0
2,4,6-Tribromophenol	Ave	0.0920	0.0983		8550	8000	6.8	20.0
p-Terphenyl-d14	Ave	0.9641	1.014		8410	8000	5.1	20.0

JN 2/19/13

CCAL-SVOC

Report Date: 28-Dec-2012 11:52:47 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121228-17911.b\X3360.D		
Lims ID:	CCVIS	Client ID:	
Inject. Date:	28-Dec-2012 11:21:30	Dil. Factor:	1.0000
Sample Type:	CCVIS		
Sample ID:	480-0017911-002		
Misc. Info.:			
Operator:	RMM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	3
Lims Batch ID:	97673	Lims Sample ID:	2
Sublist:	chrom-X-8270LL*sub20		
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973X\20121228-17911.b\X-8270LL.m		
Last Update:	28-Dec-2012 11:52:47	Calib Date:	18-Dec-2012 14:44:30
Quant Method:	Internal Standard	Quant By:	Continuing Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3139.D		
Limit Group:	MB - 8270RCP_MCP ICAL		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Process Host:	XAWRK025		

First Level Reviewer: mckernar Date: 28-Dec-2012 11:52:47

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.499	6.499	0.0	90	223410	5.00	
* 2 Naphthalene-d8	136	8.420	8.420	0.0	98	831874	5.00	
* 3 Acenaphthene-d10	164	11.059	11.059	0.0	90	570706	5.00	
* 4 Phenanthrene-d10	188	13.071	13.071	0.0	96	1026574	5.00	
* 5 Chrysene-d12	240	15.734	15.734	0.0	86	1011177	5.00	
* 6 Perylene-d12	264	17.023	17.023	0.0	99	901218	5.00	
$ 7 2-Fluorophenol	112	4.596	4.596	0.0	73	429033	8.46	
$ 8 Phenol-d5	99	6.018	6.018	0.0	85	504782	8.18	
$ 9 Nitrobenzene-d5	82	7.345	7.345	0.0	85	530750	8.51	
$ 10 2-Fluorobiphenyl	172	10.075	10.075	0.0	93	1237817	8.64	
$ 11 2,4,6-Tribromophenol	330	12.224	12.224	0.0	70	161421	8.55	
$ 12 p-Terphenyl-d14	244	14.759	14.759	0.0	96	1640077	8.41	
18 1,4-Dioxane	88		2.452					19
19 N-Nitrosodimethylamine	42	2.709	2.709	0.0	61	353589	8.66	
20 Pyridine	52	2.766	2.766	0.0	89	316377	7.63	
21 Benzaldehyde	77	5.861	5.861	0.0	89	363380	8.30	
23 Aniline	93	6.023	6.023	0.0	97	663465	8.11	
(1) 22 Phenol RRF = $\frac{531175}{223410} \times \frac{5}{8}$	94	6.033	6.033	0.0	36	531175	7.81	
24 Bis(2-chloroethyl)ether	93	6.133	6.133	0.0	96	411655	7.68	
25 2-Chlorophenol = 1.486	128	6.194	6.194	0.0	96	463533	8.01	
26 1,3-Dichlorobenzene	146	6.408	6.408	0.0	95	546231	7.61	
27 1,4-Dichlorobenzene	146	6.527	6.527	0.0	72	569670	7.95	
28 Benzyl alcohol	108	6.741	6.741	0.0	81	170845	8.19	
29 1,2-Dichlorobenzene	146	6.746	6.746	0.0	84	532122	7.96	
31 2-Methylphenol	108	6.936	6.936	0.0	77	373965	7.70	
32 2,2'-oxybis[1-chloropropane]	45	6.946	6.946	0.0	79	684677	7.86	
33 Acetophenone	105	7.126	7.126	0.0	94	680405	8.21	
34 N-Nitrosodi-n-propylamine	70	7.136	7.136	0.0	84	351246	8.44	
36 4-Methylphenol	108	7.183	7.183	0.0	77	378561	7.70	

$\%D = \frac{1.486 - 1.523}{1.523} = -2.4\%$ OK

JR 2/19/13

CCAL - SVOC

Report Date: 28-Dec-2012 11:52:47 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121228-17911.b\X3360.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
37 Hexachloroethane	117	7.245	7.245	0.0	84	211397	7.43	
38 Nitrobenzene	77	7.378	7.378	0.0	76	556060	8.59	
40 Isophorone	82	7.745	7.745	0.0	74	866008	8.13	
41 2-Nitrophenol	139	7.859	7.859	0.0	88	252636	8.57	
43 2,4-Dimethylphenol	107	7.978	7.978	0.0	87	414533	7.46	
44 Benzoic acid	105	8.168	8.168	0.0	1	254904	8.80	
45 Bis(2-chloroethoxy)methane	93	8.101	8.101	0.0	96	488470	7.74	
47 2,4-Dichlorophenol	162	8.254	8.254	0.0	83	436518	9.65	
48 1,2,4-Trichlorobenzene	180	8.344	8.344	0.0	99	496095	8.92	
(2) 49 Naphthalene RRF = $\frac{1403617}{831874} \times \frac{5}{8}$	128	8.448	8.448	0.0	94	1403617	7.62	
51 4-Chloroaniline	127	8.582	8.582	0.0	87	545673	8.18	
52 Hexachlorobutadiene	225	8.648	8.648	0.0	86	315696	10.4	
54 Caprolactam = 1.05456	113	9.119	9.119	0.0	69	108370	6.58	
55 4-Chloro-3-methylphenol	107	9.376	9.376	0.0	92	409914	8.20	
56 2-Methylnaphthalene OK	142	9.504	9.504	0.0	80	1049819	8.13	
57 1-Methylnaphthalene	142	9.652	9.652	0.0	92	972061	8.17	
58 Hexachlorocyclopentadiene	237	9.742	9.742	0.0	87	212071	9.80	
59 1,2,4,5-Tetrachlorobenzene	216	9.761	9.761	0.0	90	487471	9.10	
60 2,4,6-Trichlorophenol	196	9.966	9.966	0.0	98	335155	10.2	
61 2,4,5-Trichlorophenol	196	10.046	10.046	0.0	96	316119	9.92	
62 1,1'-Biphenyl	154	10.218	10.218	0.0	99	1310643	7.94	
63 2-Chloronaphthalene	162	10.260	10.260	0.0	94	1050572	8.25	
64 Phenyl ether	170	10.379	10.379	0.0	94	763598	8.51	
65 2-Nitroaniline	65	10.436	10.436	0.0	79	333971	8.84	
66 1,4-Dinitrobenzene	75	10.660	10.660	0.0	84	201229	0	
67 Dimethyl phthalate	163	10.717	10.717	0.0	94	1276970	8.65	
68 2,6-Dinitrotoluene	165	10.807	10.807	0.0	96	598870	8.95	
69 Acenaphthylene	152	10.845	10.845	0.0	89	1596700	8.00	
70 3-Nitroaniline	138	11.064	11.064	0.0	91	264193	7.95	
(3) 71 Acenaphthene RRF = $\frac{1016379}{570706} \times \frac{5}{8}$	153	11.107	11.107	0.0	89	1016379	7.31	
72 2,4-Dinitrophenol	184	11.235	11.235	0.0	89	279958	19.6	
75 4-Nitrophenol	109	11.430	11.430	0.0	14	476081	16.7	M
73 Dibenzofuran = 1.1131 OK	168	11.373	11.373	0.0	99	1523331	8.98	
74 2,4-Dinitrotoluene	165	11.411	11.411	0.0	98	407279	9.53	
76 2,3,4,6-Tetrachlorophenol	232	11.587	11.587	0.0	88	299198	11.7	
78 Diethyl phthalate	149	11.768	11.768	0.0	93	1286796	7.96	
79 Fluorene	166	11.872	11.872	0.0	89	1293475	8.34	
80 4-Chlorophenyl phenyl ether	204	11.896	11.896	0.0	94	631854	9.20	
81 4-Nitroaniline	138	11.972	11.972	0.0	84	286458	7.83	
82 4,6-Dinitro-2-methylphenol	198	12.006	12.006	0.0	72	475963	19.2	
83 N-Nitrosodiphenylamine	169	12.072	12.072	0.0	99	1992943	8.35	
84 Diphenylamine	169	12.072	12.072	0.0	99	1992943	8.34	
85 Azobenzene	77	12.110	12.110	0.0	94	1279308	8.31	
16 1,2-Diphenylhydrazine	77	12.110	12.110	0.0	93	1279308	8.29	
86 Benzophenone	105	12.134	12.134	0.0	97	950120	7.00	
89 4-Bromophenyl phenyl ether	248	12.538	12.538	0.0	88	339266	8.82	
91 Hexachlorobenzene	284	12.600	12.600	0.0	79	364196	8.98	
92 Simazine	201	12.757	12.757	0.0	80	201739	0	
93 Atrazine	200	12.795	12.795	0.0	92	789423	18.4	
95 Pentachloronitrobenzene	237	12.871	12.871	0.0	85	203419	9.35	
94 Pentachlorophenol	266	12.876	12.876	0.0	76	377435	18.9	
(4) 97 Phenanthrene	178	13.099	13.099	0.0	94	1840459	8.04	

RRF = $\frac{1840459}{1026574} \times \frac{5}{8}$ = 1.1205 OK

JR 2/19/13

CCAL - SVOL

Report Date: 28-Dec-2012 11:52:47 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121228-17911.b\X3360.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
98 Anthracene	178	13.161	13.161	0.0	95	1875779	8.05	
99 Carbazole	167	13.370	13.370	0.0	99	1738462	8.05	
101 Alachlor	160	13.523	13.523	0.0	91	375070	0	
102 Di-n-butyl phthalate	149	13.760	13.760	0.0	96	2078722	8.30	
104 Fluoranthene	202	14.388	14.388	0.0	96	2030912	8.96	
105 Benzidine	184	14.555	14.555	0.0	99	609076	5.45	
106 Pyrene	202	14.607	14.607	0.0	97	2081245	7.68	
107 Famphur	218	15.168	15.168	0.0	80	809625	0	
108 Butyl benzyl phthalate	149	15.216	15.216	0.0	94	1005945	6.71	
109 3,3'-Dichlorobenzidine	252	15.705	15.705	0.0	90	722234	7.95	
110 Bis(2-ethylhexyl) phthalate	149	15.715	15.715	0.0	95	1349652	6.54	
111 Benzo[a]anthracene	228	15.725	15.725	0.0	95	1908852	8.76	
(5) 112 Chrysene	228	15.763	15.763	0.0	90	1779101	7.20	
113 Di-n-octyl phthalate	149	16.252	16.252	0.0	97	2095212	6.44	
114 Benzo[b]fluoranthene	252	16.661	16.661	0.0	93	1789391	8.55	
115 Benzo[k]fluoranthene	252	16.685	16.685	0.0	98	1844248	8.55	
116 Benzo[a]pyrene	252	16.966	16.966	0.0	72	1577425	7.79	
(6) 117 Indeno[1,2,3-cd]pyrene	276	18.107	18.107	0.0	95	1746303	8.08	
118 Dibenz(a,h)anthracene	278	18.102	18.102	0.0	60	1397647	7.62	
119 Benzo[g,h,i]perylene	276	18.421	18.421	0.0	96	1416383	7.86	
S 121 3-Methylphenol	1		0.000					

$RRF = \frac{1779101}{1011177} \times \frac{5}{8} = 1.09965$ OK

$RRF_{\text{Indeno (1,2,3-cd) pyrene}} = 1746303 / 901218 \times \frac{5}{8} = 1.2111$ 2/19/13

QC Flag Legend

Processing Flags
1 - Missing Peaks
9 - Failed A Reference Spectral Test

Review Flags
M - Manually Integrated

Method Blank - SVOC

Report Date: 02-Jan-2013 11:53:02 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121228-17911.b\X3361.D		
Lims ID:	MB 480-97118/1-A	Client ID:	
Inject. Date:	28-Dec-2012 11:52:30	Dil. Factor:	1.0000
Sample Type:	MB		
Sample ID:	480-0017911-003		
Misc. Info.:			
Operator:	RMM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	4
Lims Batch ID:	97673	Lims Sample ID:	3
Detector:	MS SCAN		

Method:	\\Bufchrom\ChromData\HP5973X\20121228-17911.b\X-8270LL.m		
Last Update:	31-Dec-2012 10:16:01	Calib Date:	18-Dec-2012 14:44:30
Quant Method:	Internal Standard	Quant By:	Continuing Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3139.D		
Limit Group:	MB - 8270RCP_MCP ICAL		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Process Host:	XAWRK016		

First Level Reviewer: mckernar Date: 28-Dec-2012 12:16:40

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.551	6.499	0.052	81	156860	5.00	
* 2 Naphthalene-d8	136	8.434	8.420	0.014	97	566160	5.00	
* 3 Acenaphthene-d10	164	11.064	11.059	0.005	91	395084	5.00	
* 4 Phenanthrene-d10	188	13.085	13.071	0.014	96	695354	5.00	
* 5 Chrysene-d12	240	15.724	15.734	-0.010	96	710338	5.00	
* 6 Perylene-d12	264	17.008	17.023	-0.015	92	613234	5.00	
$ 7 2-Fluorophenol	112	4.653	4.596	0.057	64	104879	2.79 *	
$ 8 Phenol-d5	99	6.080	6.018	0.062	79	91913	2.07 *	M
$ 9 Nitrobenzene-d5	82	7.388	7.345	0.043	83	238146	5.27 *	
$ 10 2-Fluorobiphenyl	172	10.075	10.075	0.0	94	554046	5.17	
$ 11 2,4,6-Tribromophenol	330	12.238	12.224	0.014	42	65472	4.79	
$ 12 p-Terphenyl-d14	244	14.754	14.759	-0.005	96	1025628	7.12	
15 4-Chloro-3-nitro-alpha,alpha,alp	1		0.000					
13 4-tert-Octylphenol	1		0.000					
14 Alpha-Terpineol	59		0.000					
17 1,2,3-Trimethylbenzene	1		0.000					
18 1,4-Dioxane	88	2.475	2.452	0.023	1	2521	0	
19 N-Nitrosodimethylamine	42		2.709				14	
20 Pyridine	52		2.766				14	
21 Benzaldehyde	77		5.861				9	
23 Aniline	93		6.023					
22 Phenol	94		6.033					
24 Bis(2-chloroethyl)ether	93		6.133					
25 2-Chlorophenol	128		6.194					
26 1,3-Dichlorobenzene	146		6.408					
27 1,4-Dichlorobenzene	146		6.527					
28 Benzyl alcohol	108		6.741					
29 1,2-Dichlorobenzene	146		6.746					
30 Pentachlorophenol_T	266		6.787					
31 2-Methylphenol	108		6.936					

gr 3/13/13

OK See attached reissued MB summary

%rec

Conc 2-FP = $\frac{104879}{156860} \times \frac{5.0}{1.135} = 2.94^*$ 37*

Conc phenol-d5 = $\frac{91913}{156860} \times \frac{5.0}{1.381} = 2.12^*$ 24*

Conc NB-d5 = $\frac{238146}{566160} \times \frac{5.0}{.3749} = 5.61^*$ 70*

* Appears that lab used daily RRF (not $\overline{RRF}$) for calculation of concentrations for QC and samples. CL 2/20/13

Method Blank - SVOC

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-30497-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 480-97118/1-A
Matrix: Water
Lab File ID: X3361.D
Analysis Method: 8270D
Date Collected:
Extract. Method: 3510C
Date Extracted: 12/21/2012 15:01
Sample wt/vol: 1000(mL)
Date Analyzed: 12/28/2012 11:52
Con. Extract Vol.: 1(mL)
Dilution Factor: 1
Injection Volume: 1(uL)
Level: (low/med) Low
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 97673
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
98-86-2	Acetophenone	ND		1.0	0.30
95-50-1	1,2-Dichlorobenzene	ND		1.0	0.30
91-94-1	3,3'-Dichlorobenzidine	ND		2.0	0.36
67-72-1	Hexachloroethane	ND		1.0	0.30
131-11-3	Dimethyl phthalate	ND		1.0	0.30

CAS NO.	SURROGATE	%REC	Q	LIMITS
118-79-6	2,4,6-Tribromophenol	60		15-110
4165-60-0	Nitrobenzene-d5	66		30-130
4165-62-2	Phenol-d5	26		15-110
321-60-8	2-Fluorobiphenyl	65		30-130
1718-51-0	p-Terphenyl-d14	89		30-130
367-12-4	2-Fluorophenol	35		15-110

Calcs checked and do not match; appears lab used daily RRF (not $\overline{RRF}$) for calcs.

OK - see attached corrected method blank summary
JN 2/20/13 JN 3/13/13

FORM I 8270D

LCS – SVOC

Report Date: 02-Jan-2013 11:53:05 Chrom Revision: 2.0 22-Oct-2012 16:30:48

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121228-17911.b\X3362.D		
Lims ID:	LCS 480-97118/2-A	Client ID:	
Inject. Date:	28-Dec-2012 12:17:30	Dil. Factor:	1.0000
Sample Type:	LCS		
Sample ID:	480-0017911-004		
Misc. Info.:			
Operator:	RMM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	5
Lims Batch ID:	97673	Lims Sample ID:	4
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973X\20121228-17911.b\X-8270LL.m		
Last Update:	31-Dec-2012 10:16:01	Calib Date:	18-Dec-2012 14:44:30
Quant Method:	Internal Standard	Quant By:	Continuing Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3139.D		
Limit Group:	MB - 8270RCP_MCP ICAL		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Process Host:	XAWRK016		

gr 3/13/13

Conc 2-FP = 92324 / 141415 x 5.0 / 1.135 = 2.88* % rec = 2.88 / 8 = 36*

OK – see attached reissued LCS results

Conc 4-methylphenol = 302403 / 141415 x 5.0 / 1.101 = 9.71* % rec = 9.71 / 8 = 121**

** 4-MP not reported on LCS summary

First Level Reviewer: mckernar Date: 28-Dec-2012 12:44:53

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.532	6.499	0.033	83	141415	5.00	
* 2 Naphthalene-d8	136	8.434	8.420	0.014	97	523224	5.00	
* 3 Acenaphthene-d10	164	11.073	11.059	0.014	84	374396	5.00	
* 4 Phenanthrene-d10	188	13.085	13.071	0.014	96	644151	5.00	
* 5 Chrysene-d12	240	15.743	15.734	0.009	86	643083	5.00	
* 6 Perylene-d12	264	17.023	17.023	0.0	98	624273	5.00	
$ 7 2-Fluorophenol	112	4.625	4.596	0.029	45	92324	2.72 *	
$ 8 Phenol-d5	99	6.052	6.018	0.034	60	83514	2.09	
$ 9 Nitrobenzene-d5	82	7.374	7.345	0.029	85	249052	5.97	
$ 10 2-Fluorobiphenyl	172	10.079	10.075	0.004	95	654701	6.45	
$ 11 2,4,6-Tribromophenol	330	12.234	12.224	0.010	46	86762	6.85	
$ 12 p-Terphenyl-d14	244	14.764	14.759	0.005	96	957094	7.34	
18 1,4-Dioxane	88	2.471	2.452	0.019	1	3607	0	
19 N-Nitrosodimethylamine	42	2.723	2.709	0.015	63	111729	3.99	
20 Pyridine	52	2.789	2.766	0.023	79	96721	3.86	M
21 Benzaldehyde	77	5.890	5.861	0.029	87	163307	5.68	
23 Aniline	93	6.056	6.023	0.033	96	297845	5.67	
22 Phenol	94	6.075	6.033	0.042	39	119796	2.85	
24 Bis(2-chloroethyl)ether	93	6.161	6.133	0.029	98	188811	5.80	
25 2-Chlorophenol	128	6.227	6.194	0.033	95	174881	4.77	
26 1,3-Dichlorobenzene	146	6.441	6.408	0.033	97	221580	5.13	
27 1,4-Dichlorobenzene	146	6.560	6.527	0.033	71	219712	4.87	
28 Benzyl alcohol	108	6.774	6.741	0.033	75	75398	5.58	
29 1,2-Dichlorobenzene	146	6.779	6.746	0.033	84	230183	5.47	
31 2-Methylphenol	108	6.965	6.936	0.029	70	158689	5.36	
32 2,2'-oxybis[1-chloropropane]	45	6.974	6.946	0.028	65	312299	5.76	M
33 Acetophenone	105	7.150	7.126	0.024	94	663255	12.3	
34 N-Nitrosodi-n-propylamine	70	7.160	7.136	0.024	89	170825	6.15	
36 4-Methylphenol	108	7.212	7.183	0.029	81	302403	10.1	gr 2/20/13
37 Hexachloroethane	117	7.274	7.245	0.029	80	77852	4.65	

* Appears that lab used daily RRF instead of IRAL RRF for all sample and QC calculations.

LCS - SVOC

Report Date: 02-Jan-2013 11:53:05 Chrom Revision: 2.0 22-Oct-2012 16:30:48

Data File: \\Bufchrom\ChromData\HP5973X\20121228-17911.b\X3362.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
38 Nitrobenzene	77	7.402	7.378	0.024	80	262490	6.00	
40 Isophorone	82	7.764	7.745	0.019	77	434737	6.39	
41 2-Nitrophenol	139	7.882	7.859	0.023	80	109464	5.51	
43 2,4-Dimethylphenol	107	8.001	7.978	0.023	86	187014	5.74	
45 Bis(2-chloroethoxy)methane	93	8.120	8.101	0.019	99	262522	6.84	
44 Benzoic acid	105	8.111	8.168	-0.057	87	692	0.0345	
47 2,4-Dichlorophenol	162	8.277	8.254	0.023	81	193044	5.62	M
48 1,2,4-Trichlorobenzene	180	8.358	8.344	0.014	96	207498	5.32	
49 Naphthalene	128	8.467	8.448	0.019	92	695553	6.30 *	
51 4-Chloroaniline	127	8.601	8.582	0.018	97	269602	6.28	
52 Hexachlorobutadiene	225	8.662	8.648	0.014	79	130004	5.24	
54 Caprolactam	113	9.143	9.119	0.024	15	23793	2.79	M
55 4-Chloro-3-methylphenol	107	9.395	9.376	0.019	89	202585	6.29	
56 2-Methylnaphthalene	142	9.514	9.504	0.010	77	511596	6.20	
57 1-Methylnaphthalene	142	9.656	9.652	0.004	94	949990	12.4	
58 Hexachlorocyclopentadiene	237	9.747	9.742	0.005	81	71028	4.08	
59 1,2,4,5-Tetrachlorobenzene	216	9.770	9.761	0.009	92	242352	6.06	
60 2,4,6-Trichlorophenol	196	9.980	9.966	0.014	96	172365	6.27	
61 2,4,5-Trichlorophenol	196	10.060	10.046	0.014	89	154385	5.96	
62 1,1'-Biphenyl	154	10.227	10.218	0.009	98	692480	6.44	
63 2-Chloronaphthalene	162	10.270	10.260	0.010	94	549368	6.38	
64 Phenyl ether	170	10.389	10.379	0.010	93	391643	6.25	
65 2-Nitroaniline	65	10.450	10.436	0.014	87	182798	6.67	
66 1,4-Dinitrobenzene	75	10.679	10.660	0.019	78	113936	0	
67 Dimethyl phthalate	163	10.726	10.717	0.009	94	713677	6.82	
68 2,6-Dinitrotoluene	165	10.817	10.807	0.010	93	173224	3.53	
69 Acenaphthylene	152	10.859	10.845	0.014	90	899526	6.87	
70 3-Nitroaniline	138	11.083	11.064	0.019	76	134501	6.21	
71 Acenaphthene	153	11.121	11.107	0.014	91	559209	6.71*	
72 2,4-Dinitrophenol	184	11.283	11.235	0.048	74	50249	4.38	M
73 Dibenzofuran	168	11.383	11.373	0.009	99	848541	6.79	
74 2,4-Dinitrotoluene	165	11.435	11.411	0.024	95	228515	6.84	
75 4-Nitrophenol	109	11.539	11.430	0.109	17	35660	1.83	M
76 2,3,4,6-Tetrachlorophenol	232	11.611	11.587	0.024	89	152633	6.22	
78 Diethyl phthalate	149	11.782	11.768	0.014	94	738728	7.00	
79 Fluorene	166	11.887	11.872	0.015	79	749405	7.07	
80 4-Chlorophenyl phenyl ether	204	11.906	11.896	0.010	91	352409	6.80	
81 4-Nitroaniline	138	11.996	11.972	0.024	81	150510	6.41	
82 4,6-Dinitro-2-methylphenol	198	12.029	12.006	0.023	66	105073	5.38	
84 Diphenylamine	169	12.082	12.072	0.010	98	1215344	7.77	
83 N-Nitrosodiphenylamine	169	12.082	12.072	0.010	98	1215344	7.77	
16 1,2-Diphenylhydrazine	77	12.124	12.110	0.014	95	749437	7.47	
86 Benzophenone	105	12.143	12.134	0.009	95	565407	7.26	
89 4-Bromophenyl phenyl ether	248	12.552	12.538	0.014	90	204298	7.68	
91 Hexachlorobenzene	284	12.614	12.600	0.014	71	184381	6.45	
93 Atrazine	200	12.795	12.795	0.0	89	229144	7.08	
95 Pentachloronitrobenzene	237	12.881	12.871	0.009	55	112392	7.04	
94 Pentachlorophenol	266	12.900	12.876	0.024	21	59939	4.05	
97 Phenanthrene	178	13.109	13.099	0.010	94	1127909	7.81	
98 Anthracene	178	13.171	13.161	0.010	95	1126600	7.66	
99 Carbazole	167	13.380	13.370	0.010	99	1043052	7.65	
102 Di-n-butyl phthalate	149	13.765	13.760	0.005	96	1273740	7.81	

gr 3/13/13 reissued LCS results! gr 2/20/13

Conc Naphthalene = $\frac{695553}{523224} \times \frac{5.0}{1.108}$ = 5.999*

Conc Acenaphthene = $559209/374396 \times \frac{5.0}{1.218}$ = 6.13*

OK - see attached * lab used daily RRF not RRF as required

Sample - SVOC

Report Date: 09-Mar-2013 10:31:10 Chrom Revision: 2.0 01-Feb-2013 10:03:10

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121228-17911.b\X3366.D		
Lims ID:	480-30497-A-3-A	Client ID:	OC-SW-SD-1-XXX
Inject. Date:	28-Dec-2012 14:00:30	Dil. Factor:	1.0000
Sample Type:	Client		
Sample ID:	480-0017911-008		
Misc. Info.:			
Operator:	RMM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	9
Lims Batch ID:	97673	Lims Sample ID:	8
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973X\20121228-17911.b\X-8270LL.m		
Last Update:	09-Mar-2013 10:31:04	Calib Date:	18-Dec-2012 14:44:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3139.D		
Limit Group:	MB - 8270RCP_MCP ICAL		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Process Host:	XAWRK034		

First Level Reviewer: mckernar Date: 28-Dec-2012 15:59:14

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.494	6.499	-0.005	84	136454	5.00	
* 2 Naphthalene-d8	136	8.396	8.420	-0.024	97	537923	5.00	
* 3 Acenaphthene-d10	164	11.050	11.059	-0.009	89	367945	5.00	
* 4 Phenanthrene-d10	188	13.094	13.071	0.023	95	678684	5.00	
* 5 Chrysene-d12	240	15.743	15.734	0.009	96	677158	5.00	
* 6 Perylene-d12	264	17.023	17.023	0.0	92	657117	5.00	
$ 7 2-Fluorophenol	112	4.558	4.596	-0.038	46	102643	3.31 ✓	
$ 8 Phenol-d5	99	6.023	6.018	0.005	94	71262	1.89 ✓	
$ 9 Nitrobenzene-d5	82	7.340	7.345	-0.005	84	236967	5.88 ✓	
$ 10 2-Fluorobiphenyl	172	10.046	10.075	-0.029	95	619372	6.71	
$ 11 2,4,6-Tribromophenol	330	12.238	12.224	0.014	72	103090	8.26	
$ 12 p-Terphenyl-d14	244	14.768	14.759	0.009	95	979559	7.50	
21 Benzaldehyde	77		5.861					
23 Aniline	93		6.023					
22 Phenol	94		6.033					9
24 Bis(2-chloroethyl)ether	93		6.133					
25 2-Chlorophenol	128		6.194					
28 Benzyl alcohol	108		6.741					
29 1,2-Dichlorobenzene	146		6.746					9
31 2-Methylphenol	108		6.936					
32 2,2'-oxybis[1-chloropropane]	45		6.946					
33 Acetophenone	105		7.126					
34 N-Nitrosodi-n-propylamine	70		7.136					14
35 DFTPP								
36 4-Methylphenol	108		7.183					
37 Hexachloroethane	117		7.245					19
38 Nitrobenzene	77		7.378					
40 Isophorone	82		7.745					9
41 2-Nitrophenol	139		7.859					
43 2,4-Dimethylphenol	107		7.978					9

Conc 2-FP $= \frac{102643}{136454} \times \frac{5.0}{1.135} = 3.314$ OK

$\%r = \frac{3.314}{8} = 41$ OK

Conc Phenol-d_5 $= \frac{71262}{136454} \times \frac{5.0}{1.381} = 1.89$ OK

$\%r = \frac{1.89}{8} = 24$ OK

Conc NB-d_5 $= \frac{236967}{537923} \times \frac{5.0}{.3749} = 5.88$ OK

$\%r = \frac{5.88}{8} = 73$ OK

JR 3/13/13

OLIN-WILMINGTON
CHEMIST REVIEW
STANDARD OPERATING PROCEDURE AND CHECKLIST
N-NITROSODIMETHYLAMINE (NDMA) AND
N-NITROSODI-N-PROPYLAMINE (NDPA) BY METHOD 521

Reviewer/Date Tige Cunningham 2/27/13
Sr. Review/Date
Lab Report # 480-30497-1
Project 6107130016-10
December SW

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Check items received. **Yes** [✓] No [ ] N/A [ ] Comments:

[✓] *Name of Laboratory* [✓] *Address* [✓] *Project ID* [✓] *Phone #* [✓] *Sample identification – Field and Laboratory (IDs must be cross-referenced)*

Client Information: [✓] *Name* [✓] *Address* [✓] *Client Contact*

[✓] Data Package Narrative [✓] results and QC summaries [✓] raw data [✓] chromatograms

ACTION: If no, contact lab for submission of missing or illegible information.

1.1 Laboratory Case Narrative:

Yes [✓] *No* [ ] *N/A* [ ] *Comments:*

[✓] *Narrative serves as an exception report for the project and method QA/QC performance.*

***ACTION**: If no, contact lab for submission of missing or illegible information.*

1.2 Chain of Custody (COC) copy present of completed COC? **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include a copy of the completed Chain of Custody forms containing all samples in this SDG?

ACTION: If no, contact lab for submission of missing completed *COC*.

1.3 Sample Receipt Information (*Cooler Receipt Form*): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory? **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☑ Container type noted ☑ Condition observed ☑ Field and lab IDs cross referenced **ACTION**: If no, contact lab for submission of missing or incomplete documentation.

1.3.1 Were the correct bottles and preservatives used? **Yes** [✓] No [ ] N/A [ ] Comments:

Water - 1 Liter amber bottle cool to 4°C. Sodium thiosulfate may be added if source is chlorinated.

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) if cooler temperature exceeds 10°C or use professional judgment for data rejection.

1.3.2 Were all samples delivered to the laboratory without breakage? **Yes** [✓] No [ ] N/A [ ] Comments:

1.3.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? Yes [ ] **No** [✓] N/A [ ] Comments:

1.4 Sample Results Section: *Was the following information supplied in the laboratory report for each sample?* **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Field ID and Lab ID ☑ *Date and time collected* ☑ Analyst Initials ☑ *Dilution Factor* ☑ *Reporting limits*
☑ Analysis method ☑ *Preparation method* ☑ *Date of preparation/extraction/ and analysis,* ☑ Matrix ☑ Target analytes and concentrations ☐ Units

ACTION: If no, contact lab for submission of missing or incomplete information.

1.5 QA/QC Information: Was the following information provided in the laboratory report for each sample batch?

Yes [✓] No [ ] Comments:

☑ Method blank results ☑ LCS recoveries ☐ MS/MSD recoveries and RPDs (Not Submitted) ☑ Internal Standard Recoveries

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times Yes [ ] **No** [✓] N/A [ ] Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded?

NOTE: For water samples, the holding time is 7 days from sampling to extraction and 40 days from extraction to analysis.

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. For soil samples professional judgement will be used to determine if rejection is necessary.

3.0 Laboratory Method — **Yes** [✓] No [ ] N/A [ ] Comments:

3.1 Was the correct laboratory method used?

Water Extraction 3510C or *3520C*
NDMA and NDPA 521

ACTION: If no, contact project manager to inform Client of change; request variance from Client; contact laboratory to provide justification for method change compared to the requested method.

3.2 Are the practical quantitation limits the same as those specified by the [✓] QAPP — **Yes** [✓] No [ ] N/A [ ] Comments: Lab reported values to 2ng/L

NOTE: *The project PQL is 2 ng/L for GW and 5 ng/L for SW.*

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Did the (TC) laboratory complete a mulit-point initial calibration with a NDMA ~~RPD~~ ≤ 20? Is NDPA ~~RPD~~ ≤ 30? Is the low point standard equal to the PQL? %RSD (TC) %RSD — **Yes** [ ] No [✓]

Comments: Initial Cal from 12/4/12. NDMA was calibrated using Linear Regression R^2 = 0.995. ~~RRF~~ %RSD was calculated for RRF @ 26.8% NDMA Qualified J/UJ in Samples

Has a second source standard been analyzed to verify initial calibration? Is the percent difference < 25? — **Yes** [✓] No [ ]

NDMA = 2% D
NDPA = 15.1 %D

3.4 Did the laboratory analyze a continuing calibration every 12 hours or every 20 samples? Was the NDMA recovery 80-120 percent (percent difference ≤ 20)? Was the NDPA recovery 70 -130 percent (percent difference ≤ 30)? — **Yes** [✓] No [ ]

3.5 Is the RRT in the CCAL ± 0.06 min from ICAL? — **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present? — **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 For the analysis of NDMA, has a method blank been analyzed for each analysis batch of field samples of 20 or less? — **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL?

Yes [✓] No [ ] N/A [ ] Comments:

4.4 Do any method blanks have positive results for NDMA parameters? Qualify data according to the following:

Yes [ ] **No** [✓] N/A [ ] Comments:

For NDMA contaminants:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

5.0 Laboratory Control Sample

5.1 Was a laboratory control sample extracted and run with each analytical batch of 20 samples or less?

Yes [✓] No [ ] N/A [ ] Comments:

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgment to determine the usability of sample results associated with that batch.

5.2 Is a LCS Summary Form present?

Yes [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of control limits? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: QAPP LCS recovery limits 60-140.

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit but > 10%, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project specified MS/MSDs analyzed? List project samples that were spiked. **Yes** [ ] No [✓] N/A [ ] Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the MS/MSD recovery form present? **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: If no, contact lab for resubmission of missing data.

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix? **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.4 Are any NDMA spike recoveries outside of the QC limits? Yes [ ] No [ ] N/A [✓] Comments:

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$

Where: SSR = Spiked sample result SA = Spike added
SR = Sample result

NOTE: *QAPP MS/MSD recovery limits are 60-140.*

NOTES: 1) Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: Professional judgment used to qualify associated samples. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify both positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where: S = MS sample result
D = MSD sample result

NOTE: *QAPP MS/MSD RPD limits for water ≤ 20.*

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Isotope IS Recoveries

Were internal recoveries outside of laboratory limits for any sample or method blank? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: *Lab IS recovery limits 25 -150.*

ACTION: If recoveries are <10% and sample extracts were not diluted, reject non-detects and qualify positive detections as estimated (J). For recoveries outside the lab QC limit, qualify non-detects and positives (J).

8.0 Sampling Accuracy

If ground water samples are collected directly from a tap, process stream, or with dedicated tubing, rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples. **Yes** [ ] No [✓] N/A [✓] TC Comments:

8.2 Do any rinsate blanks have positive results? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of the samples and their associated field duplicates. **Yes** [ ] No [✓] N/A [ ] Comments:

9.2 Was the RPD ≤ 30% for waters? Calculate the RPD for all results and attach to this review. **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: RPD must be ≤30% for water. Qualify data (J) for both sample results if the RPD exceeds 30%.

10.0 Calculation and Transcription Checks

- [✓] Initial Calibration
- [✓] Continuing Calibration
- [✓] Method Blank Raw Data Reveiw
- [✓] Sample NDMA and NDPA Results
- [✓] LCS
- [✓] Internal Standard Recovery

REFERENCES

MACTEC, 2009, "Project Operation Plan Volume III-B Quality Assurance Project Plan, Olin Wilmington Superfund Site, 51 Eames Street, Wilmington, MA", April 2009.

U.S. Environmental Protection Agency (USEPA), 1996. "Region 1 EPA-NE Data Validation Guidelines For Evaluating Environmental Analyses"; Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December 1996.

FORM VI
LCMS INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 480-30497-1 Analy Batch No.: 6853

SDG No.:

Instrument ID: IT1 GC Column: VF-624MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2012 14:25 Calibration End Date: 12/04/2012 20:21 Calibration ID: 1750

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD01 320-6853/4	CS-1...1.0pg-uL,
Level 2	STD02 320-6853/5	CS-2...2.0pg-uL,
Level 3	STD03 320-6853/6	CS-3...5.0pg-uL,
Level 4	STD04 320-6853/7	CS-4...10pg-uL,
Level 5	STD05 320-6853/8	CS-5...20pg-uL,
Level 6	STD06 320-6853/9	CS-6...50pg-uL,
Level 7	STD07 320-6853/10	CS-7...100pg-uL,
Level 8	STD08 320-6853/11	CS-8...200pg-uL,

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5		B	M1	M2								
N-Nitrosodimethylamine	+++++ 4784.0	2273.5 5284.9	3796.0 6069.1	4667.7	4513.2	L2ID	-3.081	2.6818							0.9950	✓	0.9900
N-Nitrosomethylethylamine	5755.0 6154.9	5333.5 6590.1	5705.4 7050.7	6590.6	6019.0	AveID		3.1835				8.6		30.0			
N-Nitrosodiethylamine	3304.0 2528.2	2938.5 2595.5	3121.6 2487.8	3457.5	2712.1	AveID		1.5064				17.0		30.0			
N-Nitrosodi-n-propylamine	8977.0 7202.0	7867.5 7480.9	7486.0 6403.5	8221.4	7769.5	AveID		1.3415				13.0		30.0	✓		Average is 7675. %RSD calculated @ 9.8
N-Nitrosopyrrolidine	6425.0 9448.5	7473.0 8854.4	7143.0 8504.2	8350.8	8804.6	AveID		1.4157				12.0		30.0			
N-Nitrosopiperidine	12953 16522	13104 15372	14095 14094	15727	16626	AveID		2.5796				8.3		30.0			
N-Nitrosodi-n-butylamine	+++++ 7678.8	5081.0 6882.4	5883.4 6892.8	7097.3	7271.0	AveID		1.1508				14.0		30.0			
N-Nitrosodimethylamine-d6	0.1898 0.2007	0.1900 0.1891	0.2066 0.2024	0.1926	0.2037	Ave		0.1969				3.7		40.0	✓		
N-Nitrosodi-n-propylamine-d14	0.5483 0.6254	0.5834 0.5307	0.5926 0.5050	0.6651	0.6433	Ave		0.5867				9.6		40.0	✓		

See attached excel sheet for %RSD calculation

TC 2/27/13

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

Olin Level I
Calculations
NDMA SDG 480-27937-1, 480-27939-1, 480-30497-1
OU1/OU2 SW and SD
Olin

12/4/2012	RRF										
Analyte	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	**Ave.**	**%SD**	**%RSD**
NDMA	****	2273	3796	4667	4513	4784	5284	6069	4483.71	119989.0	26.8
NDMA-d6	0.1898	0.19	0.2066	0.1926	0.2037	0.2007	0.1891	0.2024	0.19686	0.7	3.7
NDPA	8977	7867.5	7486	8221.4	7769.5	7202	7480.9	6403.5	7675.98	75152.9	9.8
NDPA-d14	0.5483	0.5834	0.5926	0.6651	0.6433	0.6254	0.5307	0.505	0.58673	5.6	9.6

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 480-30497-1

SDG No.:

Lab Sample ID: CCV 320-7865/12 Calibration Date: 12/27/2012 04:14

Instrument ID: IT1 Calib Start Date: 12/04/2012 14:25

GC Column: VF-624MS ID: 0.25(mm) Calib End Date: 12/04/2012 20:21

Lab File ID: CS-4...10pg-uL, 12-27-2012, Conc. Units: pg/uL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
N-Nitrosodimethylamine	L2ID		2.595		10.8	10.0	8.2	20.0
N-Nitrosomethylethylamine	AveID	3.184	2.265		7.11	10.0	-28.9	30.0
N-Nitrosodiethylamine	AveID	1.506	1.243		8.25	10.0	-17.5	30.0
N-Nitrosodi-n-propylamine	AveID	1.342	1.398		10.4	10.0	4.2	30.0
N-Nitrosopyrrolidine	AveID	1.416	0.5829		4.12	10.0	-58.8*	30.0
N-Nitrosopiperidine	AveID	2.580	2.345		9.09	10.0	-9.1	30.0
N-Nitrosodi-n-butylamine	AveID	1.151	1.088		9.46	10.0	-5.4	30.0

%D $\frac{10.8}{10} - 1 = 8\%$ ✓

TC
2/27/13

Report Date: 05-Dec-2012 11:28:13 Chrom Revision: 2.1 03-Dec-2012 11:37:40

TestAmerica West Sacramento
Target Compound Quantitation Report

Data File: \\SACCHROM\ChromData\IT1\20121204-1670.b\2nd Source.10pg-uL, 12-4-2012, 9-12-17 PM.d
Lims ID: ICV
Client ID:
Inject. Date: 04-Dec-2012 21:12:18
Dil. Factor: 1.0000
Sample Type: ICV
Sample ID:
Misc. Info.:
Operator:
Instrument ID: IT1
Injection Vol: 20.0 ul
ALS Bottle#: 0
Lims Batch ID: 6853
Lims Sample ID: 12
Sublist:
Raw Data: Smoothed
Detector: MS SCAN

Method: \\SACCHROM\ChromData\IT1\20121204-1670.b\NDMA_IT1.m
Last Update: 05-Dec-2012 11:28:12
Calib Date: 04-Dec-2012 20:21:32
Quant Method: Isotopic Dilution
Quant By: Initial Calibration
Last ICal File: \\SACCHROM\ChromData\IT1\20121204-1670.b\CS-8...200pg-uL, 12-4-2012, 8-21-31 PM.d
Limit Group: MSS - NDMA_CIMSMS - ICAL
Integrator: Falcon
ID Type: RT Order ID
Column Type: VF-624MS
Column Dia: 0.25 mm
Process Host: XAWRK025

First Level Reviewer: nihartv
Date: 05-Dec-2012 11:28:12

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.212	12.212	0.0	68	198987	108.7	100.0- 100.0	100.0		
81	12.185	12.212	-0.027		552033		303.0- 303.0	277.4		
2 N-Nitrosodimethylamine										
43	12.263	12.263	0.0	82	28701		100.0- 100.0	100.0	386	
47	12.263	12.263	0.0		19593		70.8- 70.8	68.3		
	Summary Peak				48294	10.2				
3 N-Nitrosomethylethylamine										
61	14.421	14.421	0.0	77	63773	10.1			Infinity	
4 N-Nitrosodiethylamine										
75	16.237	16.237	0.0	52	34158	11.4			Infinity	
* 5 2-Chloropyridine										
110	16.871	16.871	0.0	83	1859221	200.0	100.0- 100.0	100.0		
116	16.871	16.871	0.0		1519925		83.2- 83.2	81.8		
D 6 N-Nitrosodi-n-propylamine-d14										
97	20.798	20.798	0.0	73	547870	100.4				
7 N-Nitrosodi-n-propylamine										
89	21.014	21.014	0.0	51	84602	11.5			960	
8 N-Nitrosopyrrolidine										
55	21.787	21.787	0.0	65	84613	10.9			2664	
9 N-Nitrosopiperidine										
68	22.712	22.712	0.0	67	154860	11.0			8092	

NDMA Peak Area 48294 / 4483 = 10.77 ng/ml

10.2 calculated by lab using Linear Regression OK ✓

10ng/ml Std w/in control Limits ✓

TC 2/27/13

Report Date: 27-Dec-2012 11:24:47 Chrom Revision: 2.1 24-Dec-2012 15:14:58

TestAmerica West Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121226-1972.b\MB 320-7784-1-A, 12-26-2012, 7-25-24 PM.d		
Lims ID:	MB 320-7784/1-A	Client ID:	
Inject. Date:	26-Dec-2012 19:25:25	Dil. Factor:	1.0000
Sample Type:	MB		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	7865	Lims Sample ID:	4
Raw Data:	Smoothed		
Detector:	MS SCAN		

Method:	\\SACCHROM\ChromData\IT1\20121226-1972.b\NDMA_IT1.m		
Last Update:	27-Dec-2012 11:24:47	Calib Date:	04-Dec-2012 20:21:32
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121204-1670.b\CS-8...200pg-uL, 12-4-2012, 8-21-31 PM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	XAWRK019		

First Level Reviewer: nihartv Date: 27-Dec-2012 11:24:47

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.187	12.209	-0.022	53	325398	117.2	100.0- 100.0	100.0		
81	12.161	12.209	-0.048		25902		303.0- 303.0	8.0		
4 N-Nitrosodiethylamine										
75	16.195	16.246	-0.051	1	1540	0.6283 / .5ml x .5ml = 0.31 OK			8.9	
* 5 2-Chloropyridine										
110	16.847	16.877	-0.030	84	5641392	400.0	100.0- 100.0	100.0		
116	16.847	16.877	-0.030		4372960		83.2- 83.2	77.5		
D 6 N-Nitrosodi-n-propylamine-d14										
97	20.786	20.811	-0.025	68	1200047	145.0				
8 N-Nitrosopyrrolidine										
55	21.731	21.797	-0.066	36	47094	5.54			Infinity	
9 N-Nitrosopiperidine										
68	22.688	22.719	-0.031	49	72713	4.70			348	

TC
2/27/13

TestAmerica West Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121226-1972.b\LCS 320-7784-2-A, 12-26-2012, 8-31-12 PM.d		
Lims ID:	LCS 320-7784/2-A	Client ID:	
Inject. Date:	26-Dec-2012 20:31:13	Dil. Factor:	1.0000
Sample Type:	LCS		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	7865	Lims Sample ID:	5
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20121226-1972.b\NDMA_IT1.m		
Last Update:	27-Dec-2012 11:25:52	Calib Date:	04-Dec-2012 20:21:32
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121204-1670.b\CS-8...200pg-uL, 12-4-2012, 8-21-31 PM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	XAWRK019		

First Level Reviewer: nihartv Date: 27-Dec-2012 11:25:52

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.187	12.209	-0.022	68	329507	114.5	100.0- 100.0	100.0		
81	12.153	12.209	-0.056		29931		303.0- 303.0	9.1		
2 N-Nitrosodimethylamine										M
43	12.240	12.270	-0.030	0	88542		100.0- 100.0	100.0	-0.3	M
47	12.240	12.270	-0.030		49929		70.8- 70.8	56.4		
	Summary Peak				138471	32.5				
3 N-Nitrosomethylethylamine										
61	14.333	14.422	-0.089	79	206389	39.3			Infinity	
4 N-Nitrosodiethylamine										
75	16.196	16.246	-0.050	57	139397	56.2			482	
* 5 2-Chloropyridine										
110	16.843	16.877	-0.034	80	5844950	400.0	100.0- 100.0	100.0		
116	16.843	16.877	-0.034		4738122		83.2- 83.2	81.1		
D 6 N-Nitrosodi-n-propylamine-d14										
97	20.786	20.811	-0.025	68	1217741	142.0				
7 N-Nitrosodi-n-propylamine										
89	20.994	21.017	-0.023	56	311221	38.1			6.0	
8 N-Nitrosopyrrolidine										
55	21.736	21.797	-0.061	16	173817	20.2			Infinity	
9 N-Nitrosopiperidine										
68	22.684	22.719	-0.035	56	609258	38.8			866	
10 N-Nitrosodi-n-butylamine										
57	26.110	26.131	-0.021	60	39643		100.0- 100.0	100.0	4440	
103	26.110	26.131	-0.021		245039		609.7- 609.7	618.1		
	Summary Peak				284682	40.6				

32.5 x .5ml = 16.25/20 = 81%

19.05/20 = 95%

TC
2/27/13

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121226-1972.b\480-30497-D-1-B, 12-27-2012, 10-52-12 AM.d		
Lims ID:	480-30497-D-1-B	Client ID:	OC-SW-SD-501-XXX
Inject. Date:	27-Dec-2012 10:52:13	Dil. Factor:	1.0000
Sample Type:	Client		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	7865	Lims Sample ID:	18
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20121226-1972.b\NDMA_IT1.m		
Last Update:	03-Jan-2013 13:05:26	Calib Date:	04-Dec-2012 20:21:32
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121204-1670.b\CS-8...200pg-uL, 12-4-2012, 8-21-31 PM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	XAWRK031		

First Level Reviewer: nihartv Date: 03-Jan-2013 13:05:26

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.159	12.177	-0.018	53	349008	107.6	100.0- 100.0	100.0		
81	12.142	12.177	-0.035		20586		303.0- 303.0	5.9		
* 5 2-Chloropyridine										
110	16.847	16.857	-0.010	77	6589517	400.0	100.0- 100.0	100.0		
116	16.847	16.857	-0.010		6787105		83.2- 83.2	103.0		
D 6 N-Nitrosodi-n-propylamine-d14										
97	20.785	20.794	-0.009	63	1078815	111.6				

NDMA ND @ 1.9ng/L

TC
2/27/13

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\SACCHROM\ChromData\IT1\20121226-1972.b\480-30497-C-3-B, 12-27-2012, 1-04-51 PM.d		
Lims ID:	480-30497-C-3-B	Client ID:	OC-SW-SD-1-XXX
Inject. Date:	27-Dec-2012 13:04:52	Dil. Factor:	1.0000
Sample Type:	Client		
Sample ID:			
Misc. Info.:			
Operator:		Instrument ID:	IT1
Injection Vol:	20.0 ul	ALS Bottle#:	0
Lims Batch ID:	7865	Lims Sample ID:	20
Raw Data:	Smoothed		
Detector:	MS SCAN		
Method:	\\SACCHROM\ChromData\IT1\20121226-1972.b\NDMA_IT1.m		
Last Update:	03-Jan-2013 13:08:21	Calib Date:	04-Dec-2012 20:21:32
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\SACCHROM\ChromData\IT1\20121204-1670.b\CS-8...200pg-uL, 12-4-2012, 8-21-31 PM.d		
Limit Group:	MSS - NDMA_CIMSMS - ICAL		
Integrator:	Falcon	ID Type:	RT Order ID
Column Type:	VF-624MS	Column Dia:	0.25 mm
Process Host:	XAWRK031		

First Level Reviewer: nihartv Date: 03-Jan-2013 13:08:21

Sig	RT	EXP RT	DLT RT	Q	Response	On-Col Amt ng/ml	Ratio Range	Ratio	S/N	Flags
D 1 N-Nitrosodimethylamine-d6										
50	12.148	12.177	-0.029	56	319664	104.3	100.0- 100.0	100.0		
81	12.148	12.177	-0.029		35491		303.0- 303.0	11.1		
2 N-Nitrosodimethylamine										
43	12.200	12.237	-0.037	3	126386		100.0- 100.0	100.0	10.9	
47	12.200	12.237	-0.037		72180		70.8- 70.8	57.1		
	Summary Peak				198566	47.5				
* 5 2-Chloropyridine										
110	16.842	16.857	-0.015	58	6228402	400.0	100.0- 100.0	100.0		
116	16.850	16.857	-0.007		9488141		83.2- 83.2	152.3		
D 6 N-Nitrosodi-n-propylamine-d14										
97	20.804	20.794	0.010	63	1120670	122.7				
7 N-Nitrosodi-n-propylamine										
89	20.977	20.996	-0.019	26	71938	9.57			23.2	

$$NDMA = \frac{47.5\,ng}{mL} \times \frac{.5\,ml}{.9731\,L} = 24.40\,ng/L$$

$$NDPrA = 9.57 \times \frac{.5\,ml}{.9731\,L} = 4.9172\,ng/L$$

TC
2/27/13

Dec Surface Water

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER I / (II) / (III) (circle one) See Attached Tier 3 checklist

SITE: **Olin Chemical** Project #: 6107130016-10 SDG #: 480-30497-1

LAB # : Test America - Buffalo

Sample IDs: Attached tracking sheet or sample listing.

This checklist is designed to be used with the USEPA Data Validation Guidelines Part IV (November 2008). During Level III validation, calculation and transcription checks are completed for instrument tuning, surrogates, target compounds, spike recoveries, calibration data, and internal standards as specified in the guideline. These checks are documented on attached validation notes.

Method 6020A for Copper, Lead and Silver, Hg by 7470A, All other Metals by 6010C.

YES	NO	NA		
Data completeness				
☑	☐	☐	All data summaries, QC forms and raw data available from hard copy or electronic data package	Contact lab if missing data. Lab to respond with 24 hours.
☑	☐	☐	Data summaries match EDD	
Holding Times and Preservation				
☑	☐	☐	Hold times met (6 months, 28 days Hg)	
☑	☐	☐	Preserved (waters HNO_3)	
Calibration				
☐	☑	☐	ICP/MS Instrument Tune. See RSD	Verify that tuning meets mass, resolution, and RSD method criteria.
☑	☐	☐	Mass calibration criteria ≤ 0.1amu from true	ICP: at least one blank and one standard
☑	☐	☐	Resolution <0.7 +/-0.1amu full width @ 10% peak height	Hg: at least one blank and four standards
☐	☑	☐	RSD < 5% See attached Tune Report	Correlation coefficient criteria applicable to all analyses except ICP-AES.
☑	☐	☐	Appropriate number of standards used to establish calibration curve.	90-110% for ICP-AES/MS, 80-120% for Hg. See additional qualification actions in the Region 1 guidelines.
☑	☐	☐	Correlation coefficient > 0.995 for Hg	
☑	☐	☐	Calibrated daily.	Every 10 samples or every 2 hrs.
☑	☐	☐	ICV/CCV %R within acceptance range.	
☑	☐	☐	CCVs analyzed at the proper frequency.	70-130% for QL Standard. If out low, (J) detects less then 2X QL standard and (UJ) non-detects. See additional validation actions in the Region I guidelines.
☐	☑	☐	QL Standard within limits	

Cr @ 131% → J Qual in SW-SD-503
Sn @ 59%/58% → UJ all SW samples

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

Yes	No	N/A	TIER I / II / III (circle one)	
			Blanks	
			Method:	Evaluate all blanks for contamination. Highest contaminant level used for action level. 5X the highest blank contamination is the action level.
☑	☐	☐	Method blank was prepared with each batch of samples or with a maximum of 20 samples	
☑	☐	☐	Results >MDL Cu @ 0.333 mg/L	not affecting Sample Results
☐	☑	☐	Absolute value negative MB results > 5x MDL	
☑	☐	☐	For ICP/MS verify IS responses meet method criteria	
			Calibration Blanks:	
☐	☑	☐	ICB/CCB results > IDL	
☐	☑	☐	Absolute value of negative ICB/CCB results > 5x MDL	
☑	☐	☐	CCB analyzed every 10 samples or 2 hrs.	
			Equipment/Rinseate Blanks:	
☐	☐	☑	Results >MDL	
☐	☐	☑	Absolute value of negative ICB/CCB results > 5x MDL	Not Submitted
			Interference Check Sample	
☑	☐	☐	ICS analyzed at proper frequency	An ICS must be run at the beginning and end of run or every 8 hours.
☐	☑	☐	Interference present in sample at > 50% concentration in ICS	If interferences (Al, Ca, Fe, Mg) are not > 50% ICS concentration in sample, do not apply.
☑	☐	☐	ICS AB %R 80%-120%	
			ICP-MS Internal Standard Intensities	
☑	☐	☐	Internal standard relative intensities reported by the laboratory	
☑	☐	☐	Internal standard relative intensities are within 60 – 125 %	Qualify data based on Region 1 guideline Note: MCP Limits are 30 – 120%
			Matrix Spikes	
☑	☐	☐	All compounds are within %R of 75-125% excluding results exceeding the spike concentration by ≥4x	
☑	☐	☐	Were post-digestion spikes reported for unacceptable pre-digestion spike recoveries	OC-SW-SD-1-XXX analyzed
☐	☑	☐	Was a field blank used for spike analysis	Post-digestion spikes %R limits = 75% - 125%

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

Yes No N/A **TIER I / II / III (circle one)**

Laboratory Control Samples (LCS) ☑ ☐ ☐ Percent recoveries are within limits (waters and soil 80-120%) ☑ ☐ ☐ An LCS was analyzed for each matrix, batch of samples, or every 20 samples.	
Laboratory Duplicate ☐ ☐ ☑ Was a field blank used as the lab duplicate ☐ ☐ ☑ Is the RPD within water control limits of ±20% for sample values >5x RL(35% for soil) ☐ ☐ ☑ Is the control limit of ± RL met for sample values <5x RL (2x RL for soil) ☐ ☐ ☑ Was a duplicate analyzed for every matrix and every 20 samples or batch	Not Analyzed, however MS/MSD RPD's were w/in Limits
Field Duplicate ☐ ☐ ☑ For sample values >5x RL, the RPD control limit of ± 30% (50% for soil) was met ☐ ☐ ☑ For sample values <5x RL, the control limit of ±2x RL (4x RL for soil) was met	Not Submitted
Serial Dilution ☐ ☑ ☐ Are any percent difference criteria > 15% (for samples with a concentration >50 times the IDL) ☑ ☐ ☐ Are results of the diluted samples > the original sample results	

Validator's Signature: [signature]

Date: 2/27/13

Reference:

MACTEC, Project Operation Plan Volume IIB, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. .April 2009.

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: OC-SW-SD-501-XXX

Lab Sample ID: 480-30497-1

Lab Name: TestAmerica Buffalo

Job No.: 480-30497-1

SDG ID.:

Matrix: Water

Date Sampled: 12/17/2012 12:15

Reporting Basis: WET

Date Received: 12/17/2012 18:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-38-2	Arsenic	ND	10	5.6	ug/L			1	6010
7440-39-3	Barium	49	10	0.70	ug/L			1	6010
7440-41-7	Beryllium	ND	1.0	0.30	ug/L			1	6010
7440-43-9	Cadmium	ND	1.0	0.50	ug/L			1	6010
7440-47-3	Chromium	8.5	5.0	1.0	ug/L			1	6010
7440-02-0	Nickel	5.3	10	1.3	ug/L	J		1	6010
7440-28-0	Thallium	ND	10	10	ug/L			1	6010
7440-62-2	Vanadium	ND	10	1.5	ug/L			1	6010
7440-66-6	Zinc	40	50	1.5	ug/L	J		1	6010
7782-49-2	Selenium	ND	10	8.7	ug/L			1	6010
7440-36-0	Antimony	ND	6.0	6.8	ug/L			1	6010
7429-90-5	Aluminum	210	200	60	ug/L			1	6010
7440-70-2	Calcium	190000	500	100	ug/L			1	6010
7440-48-4	Cobalt	1.2	4.0	0.63	ug/L	J		1	6010
7440-09-7	Potassium	7600	500	100	ug/L			1	6010
7439-95-4	Magnesium	13000	200	43	ug/L			1	6010
7439-96-5	Manganese	700	3.0	0.40	ug/L			1	6010
7440-23-5	Sodium	68000	1000	320	ug/L			1	6010
7440-31-5	Tin	ND	10	5.1	ug/L			1	6010
7439-89-6	Iron	430	50	19	ug/L			1	6010
7440-22-4	Silver	0.015	1.0	0.014	ug/L	J		1	6020A
7439-92-1	Lead	0.90	1.0	0.069	ug/L	J		1	6020A
7440-50-8	Copper	1.8	1.0	0.22	ug/L		B	1	6020A
7439-97-6	Mercury	ND	0.20	0.12	ug/L			1	7470A

TC
2/27/13

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: OC-SW-SD-503-XXX

Lab Sample ID: 480-30497-2

Lab Name: TestAmerica Buffalo

Job No.: 480-30497-1

SDG ID.:

Matrix: Water

Date Sampled: 12/17/2012 14:30

Reporting Basis: WET

Date Received: 12/17/2012 18:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-38-2	Arsenic	ND	10	5.6	ug/L			1	6010
7440-39-3	Barium	26	10	0.70	ug/L			1	6010
7440-41-7	Beryllium	ND	1.0	0.30	ug/L			1	6010
7440-43-9	Cadmium	ND	1.0	0.50	ug/L			1	6010
7440-47-3	Chromium	6.8	5.0	1.0	ug/L			1	6010
7440-02-0	Nickel	1.4	10	1.3	ug/L	J		1	6010
7440-28-0	Thallium	ND	10	10	ug/L			1	6010
7440-62-2	Vanadium	2.0	10	1.5	ug/L	J		1	6010
7440-66-6	Zinc	10	50	1.5	ug/L	J		1	6010
7782-49-2	Selenium	ND	10	8.7	ug/L			1	6010
7440-36-0	Antimony	ND	6.0	6.8	ug/L			1	6010
7429-90-5	Aluminum	900	200	60	ug/L			1	6010
7440-70-2	Calcium	53000	500	100	ug/L			1	6010
7440-48-4	Cobalt	ND	4.0	0.63	ug/L			1	6010
7440-09-7	Potassium	4000	500	100	ug/L			1	6010
7439-95-4	Magnesium	2400	200	43	ug/L			1	6010
7439-96-5	Manganese	120	3.0	0.40	ug/L			1	6010
7440-23-5	Sodium	18000	1000	320	ug/L			1	6010
7440-31-5	Tin	ND	10	5.1	ug/L			1	6010
7439-89-6	Iron	1500	50	19	ug/L			1	6010
7440-22-4	Silver	0.056	1.0	0.014	ug/L	J		1	6020A
7439-92-1	Lead	3.0	1.0	0.069	ug/L			1	6020A
7440-50-8	Copper	2.7	1.0	0.22	ug/L		B	1	6020A
7439-97-6	Mercury	ND	0.20	0.12	ug/L			1	7470A

TC
2/27/13

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: OC-SW-SD-1-XXX
Lab Sample ID: 480-30497-3
Lab Name: TestAmerica Buffalo
Job No.: 480-30497-1
SDG ID.:
Matrix: Water
Date Sampled: 12/17/2012 15:30
Reporting Basis: WET
Date Received: 12/17/2012 18:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-38-2	Arsenic	ND	10	5.6	ug/L			1	6010
7440-39-3	Barium	13	10	0.70	ug/L			1	6010
7440-41-7	Beryllium	ND	1.0	0.30	ug/L			1	6010
7440-43-9	Cadmium	ND	1.0	0.50	ug/L			1	6010
7440-47-3	Chromium	290	5.0	1.0	ug/L			1	6010
7440-02-0	Nickel	9.0	10	1.3	ug/L	J		1	6010
7440-28-0	Thallium	ND	10	10	ug/L			1	6010
7440-62-2	Vanadium	ND	10	1.5	ug/L			1	6010
7440-66-6	Zinc	25	50	1.5	ug/L	J		1	6010
7782-49-2	Selenium	ND	10	8.7	ug/L			1	6010
7440-36-0	Antimony	ND	6.0	6.8	ug/L			1	6010
7429-90-5	Aluminum	1800	200	60	ug/L			1	6010
7440-70-2	Calcium	23000	500	100	ug/L			1	6010
7440-48-4	Cobalt	7.6	4.0	0.63	ug/L			1	6010
7440-09-7	Potassium	1300	500	100	ug/L			1	6010
7439-95-4	Magnesium	3300	200	43	ug/L			1	6010
7439-96-5	Manganese	500	3.0	0.40	ug/L			1	6010
7440-23-5	Sodium	52000	1000	320	ug/L			1	6010
7440-31-5	Tin	ND	10	5.1	ug/L			1	6010
7439-89-6	Iron	1500	50	19	ug/L			1	6010
7440-22-4	Silver	0.017	1.0	0.014	ug/L	J		1	6020A
7439-92-1	Lead	0.43	1.0	0.069	ug/L	J		1	6020A
7440-50-8	Copper	4.4	1.0	0.22	ug/L			1	6020A
7439-97-6	Mercury	ND	0.20	0.12	ug/L			1	7470A

TC
2/27/13

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: OC-SW-PZ-17RR-XXX
Lab Sample ID: 480-30497-4
Lab Name: TestAmerica Buffalo
Job No.: 480-30497-1
SDG ID.:
Matrix: Water
Date Sampled: 12/17/2012 15:45
Reporting Basis: WET
Date Received: 12/17/2012 18:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-38-2	Arsenic	ND	10	5.6	ug/L			1	6010
7440-39-3	Barium	21	10	0.70	ug/L			1	6010
7440-41-7	Beryllium	0.56	1.0	0.30	ug/L	J		1	6010
7440-43-9	Cadmium	ND	1.0	0.50	ug/L			1	6010
7440-47-3	Chromium	710	5.0	1.0	ug/L			1	6010
7440-02-0	Nickel	14	10	1.3	ug/L			1	6010
7440-28-0	Thallium	ND	10	10	ug/L			1	6010
7440-62-2	Vanadium	2.2	10	1.5	ug/L	J		1	6010
7440-66-6	Zinc	38	50	1.5	ug/L	J		1	6010
7782-49-2	Selenium	ND	10	8.7	ug/L			1	6010
7440-36-0	Antimony	ND	6.0	6.8	ug/L			1	6010
7429-90-5	Aluminum	3600	200	60	ug/L			1	6010
7440-70-2	Calcium	26000	500	100	ug/L			1	6010
7440-48-4	Cobalt	13	4.0	0.63	ug/L			1	6010
7440-09-7	Potassium	1700	500	100	ug/L			1	6010
7439-95-4	Magnesium	5100	200	43	ug/L			1	6010
7439-96-5	Manganese	850	3.0	0.40	ug/L			1	6010
7440-23-5	Sodium	88000	1000	320	ug/L			1	6010
7440-31-5	Tin	ND	10	5.1	ug/L			1	6010
7439-89-6	Iron	3700	50	19	ug/L			1	6010
7440-22-4	Silver	ND	1.0	0.014	ug/L			1	6020A
7439-92-1	Lead	0.56	1.0	0.069	ug/L	J		1	6020A
7440-50-8	Copper	9.6	1.0	0.22	ug/L			1	6020A
7439-97-6	Mercury	ND	0.20	0.12	ug/L			1	7470A

TC
2/27/13

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1

SDG No.:

Method: 6010 Instrument ID: ICAP1

Lab Sample ID: CRI 480-97272/7 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00045

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Arsenic	0.0100	0.00783	J	78	70-130
Barium	0.00200	0.00213	J	107	70-130
Beryllium	0.00200	0.00208		104	70-130
Cadmium	0.00100	0.000900	J	90	70-130
Chromium	0.00400	0.00525	^	131	70-130
Nickel	0.0100	0.00968	J	97	70-130
Thallium	0.0200	0.0194		97	70-130
Vanadium	0.00500	0.00494	J	99	70-130
Zinc	0.0100	0.0115	J	115	70-130
Antimony	0.0200	0.0204		102	70-130
Aluminum	0.200	0.202		101	70-130
Calcium	0.500	0.548		110	70-130
Cobalt	0.00400	0.00394	J	99	70-130
Potassium	0.500	0.562		112	70-130
Magnesium	0.200	0.210		105	70-130
Manganese	0.00300	0.00292	J	97	70-130
Sodium	1.00	0.973	J	97	70-130
Tin	0.0100	0.00592	J ^	59	70-130
Iron	0.0500	0.0515		103	70-130

Lab Sample ID: CRI 480-97272/32 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00045

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Arsenic	0.0100	0.00923	J	92	70-130
Barium	0.00200	0.00196	J	98	70-130
Beryllium	0.00200	0.00216		108	70-130
Cadmium	0.00100	0.00106		106	70-130
Chromium	0.00400	0.00462	J	116	70-130
Nickel	0.0100	0.00978	J	98	70-130
Thallium	0.0200	0.0184		92	70-130
Vanadium	0.00500	0.00470	J	94	70-130
Zinc	0.0100	0.0111	J	111	70-130
Antimony	0.0200	0.0193		96	70-130
Aluminum	0.200	0.215		107	70-130

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IIB-IN

TC
2/27/13

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1

SDG No.:

Method: 6010 Instrument ID: ICAP1

Lab Sample ID: CRI 480-97272/32 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00045

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Calcium	0.500	0.585		117	70-130
Cobalt	0.00400	0.00395	J	99	70-130
Potassium	0.500	0.431	J	86	70-130
Magnesium	0.200	0.211		106	70-130
Manganese	0.00300	0.00284	J	95	70-130
Sodium	1.00	0.996	J	100	70-130
Tin	0.0100	0.00575	J ^	58	70-130
Iron	0.0500	0.0499	J	100	70-130

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IIB-IN

TC 2/27/13

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-30497-1

SDG No.:

Lab Sample ID: ICSA 480-97525/8 Instrument ID: ELAN

Lab File ID: e122612a-2.rep ICS Source: MEM_07_ICSA_00046

Concentration Units: ug/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Copper		**2.24** *	
Lead		**0.248**	
Silver		**0.222**	
Antimony		*0.515*	
Arsenic		*0.366*	
Barium		*0.236*	
Beryllium		*0.0103*	
Cadmium		*0.927*	
Chromium		*1.77*	
Mn		*1.77*	
Molybdenum	*2000*	*2111*	*106*
Nickel		*4.09*	
Selenium		*-1.63*	
Thallium		*0.0392*	
Vanadium		*0.283*	
Zinc		*7.77*	

* low level impurity in Standard

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IVA-IN

TC
2/27/13

ELAN 9000 Tuning Report

Sample ID: Mass Calibration and Resolution - Retry 1
Sample Date/Time: Wednesday, December 26, 2012 09:57:19
Tuning File: C:\Elandata\Tuning\epa.tun
Method File: C:\Elandata\Method\TA200 TUNING.mth
Dataset File: C:\Elandata\DataSet\2012_Daily\Mass Calibration and Resolution - Retry 1.1001
Smart Tune Solution ID: 1114953
Internal Standard ID: 1120742

Criteria: Mass Accuracy +/-0.07 amu; Resolution = 0.65 +/-0.05 amu

Tuning File

Analyte	Exact Mass	Meas. Mass	Mass DAC	Res. DAC	Meas. Pk. Width	Custom Res.
He	3.016	2.975	589	2064	0.672	
Be	9.012	8.975	2043	2062	0.649	
Mg	23.985	23.975	5664	2066	0.655	
Co	58.933	58.925	14145	2063	0.650	
Rh	102.905	102.925	24839	2065	0.647	
In	114.904	114.925	27751	2068	0.652	
Pb	207.977	207.975	50366	2074	0.644	
U	238.050	238.075	57673	2069	0.646	

Summary

Mass	Meas. Intens. Mean	Meas. Intens. SD	Meas. Intens. RSD
2.000	272509.877	12635.533	4.637
8.000	15.600	6.229	39.929
23.000	22023.885	359.921	1.634
58.000	1513.416	47.892	3.165
102.000	548.296	90.025	16.419
114.000	1654.357	36.239	2.191 ✓
207.000	23089.713	1342.238	5.813
237.000	39.400	3.847	9.764

RSD > 5

J/UJ Qualify
all 6020 Analytes

TC
2/27/13

INORGANICS

TAL METALS (including mercury)

REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER III Checklist

SITE: **Olin Chemical** Project #: 6 10713 0016-10 SDG #: 480-30497-1

LAB Name : TAL-Buffalo

Sample IDs: Attached tracking sheet or sample listing.

This checklist is designed to be used with the USEPA Data Validation Guidelines Part IV (November 2008). During Level III validation, calculation and transcription checks are completed for instrument tuning (ICP-MS), target compounds, spike recoveries, calibration data, and internal standards (ICP-MS) as specified in the guideline. Tier III checks contained in the USEPA Data Validation Guidelines Part IV (November 2008) are documented below.

YES	NO	NA		Action
			Holding Times and Preservation	
☑	☐	☐	Check the raw data including instrument run to verify reported sample extraction and analysis dates.	
			ICP-MS Tune	If any transcription and/or calculation errors are detected, perform a more comprehensive review to determine the magnitude of the problem. If the problem is extensive, then the validator should have the laboratory requantitate and resubmit all corrected raw data and forms.
☐	☐	☑	Were the method-required number of analyses or scans of the tuning solution performed? Not provided by Lab. Tune Report provided	
☐	☐	☑	Check raw data. Is the tune data accurately reported on the tabulated forms? Not Provided	
☐	☐	☑	Review standard preparation logs (if available in the data package) to verify that the analytes in the tuning solution were at the method-required concentrations. Not Provided by lab	Samples were Qualified during the Tier II review using information from Tune report.
			Calibration	If the correlation coefficient for any target analyte did not meet the method QC acceptance criteria, then the validator should: Estimate (J or UJ) all associated samples. Depending on the degree of the deviation from linearity, the validator may use professional judgment to reject (R) all positive detects and/or all non-detects.
☑	☐	☐	For methods that require determination of correlation coefficients for the calibration curve, verify that the method-required correlation coefficient criteria were met. Were Criteria met?	
☐	☐	☑	For methods which require replicate analyses (i.e., replicate integrations). Is the %RSD is within the method QC acceptance criteria?	If any %RSD for replicate analyses in the ICV or CCV is outside the method QC acceptance criteria, then the validator should use professional judgment to either accept or qualify associated sample data.

INORGANICS
TAL METALS (including mercury)
REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER III Checklist

YES	NO	NA		Action
Calibration (continued)				
☐	☐	☑	Review standard preparation logs (if provided in the data package) to ensure that all initial calibration, initial calibration verification, continuing calibration verification and Quantitation Limit Check Standard concentrations are accurate and traceable. Not Provided by Lab	If standards preparation data have not been submitted with the data package, then the validator should use professional judgment to determine if standards preparation data are necessary to facilitate the validation of sample data. If necessary, the validator should contact the laboratory to obtain the information.
☐	☐	☑	Check and recalculate the initial calibration, initial calibration verification, continuing calibration verification, and QL Check Standard concentrations and percent recoveries for at least one analyte per method (if standards preparation documentation was provided in the data package). Verify that the calculated values agree within 10% of the laboratory reported values. Do values agree? Not Provided by Lab	If errors greater than 10% are detected in the standard concentration calculations, then the validator should perform a more comprehensive review to determine the magnitude of the problem. If the problem is extensive, then the validator should have the laboratory requantitate and resubmit all corrected raw data and forms. If a discrepancy remains unresolved, the validator must use professional judgment to decide which value is accurate. Under these circumstances, the validator may determine that the sample data should be qualified or rejected. A discussion of the rationale for data qualification should be documented in the Data Validation Memorandum.
☑	☐	☐	For methods that require determination of calibration curve correlation coefficients, check and recalculate the correlation coefficient for at least one target analyte per method. Verify that the recalculated value agrees within ±10% of the laboratory reported value. Do values agree?	

6010C Al 12/21/12 Line

7470A Hg 12/17/12 Line

6020A Cu 12/26/12 Line

INORGANICS
TAL METALS (including mercury)
REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER III Checklist

YES	NO	NA		Action
Blanks				
☑	☐	☐	Verified from the raw data. Were the digestion/distillation and analysis dates and times, sample IDs, sequence of blank analyses and times, sample IDs, etc., accurately reported on the tabulated result forms?	If review of the raw data reveals discrepancies and/or transcription errors, then the validator should have the laboratory requantitate and resubmit all corrected raw data and forms. If a discrepancy remains unresolved, the validator must use professional judgment to decide which value is accurate. Under these circumstances, the validator may determine that the sample data should be qualified or rejected. A discussion of the rationale for data qualification and the qualifiers used should be documented in the Data Validation Memorandum.
☑	☐	☐	For ICP/MS Data. Were the standard responses and/or percent relative intensities correctly transcribed to the tabulated forms? Check 10% of the raw data for each blank to verify that internal standard responses and/or percent relative intensities have been correctly transcribed to tabulated forms and that percent relative intensities have been correctly calculated.	
☑	☑	☐	Review the raw data to confirm the presence of target analytes in the blanks and to evaluate the presence of additional contaminants. Confirm any negative results reported for the blanks as well as any negative blank results in the raw data that were not reported on the tabulated forms. Were additional contaminants found on the raw data?	If review of the raw data suggests that additional contaminants or additional negative results are present or, conversely, the review indicates false positive or false negative results have been reported, then the validator should contact the laboratory to obtain additional information and/or have the laboratory requantitate and resubmit all corrected raw data and forms. If a discrepancy remains unresolved, the validator must use professional judgment to decide which value is accurate. Under these circumstances, the validator may determine that the sample data should be qualified or rejected. A discussion of the rationale for data qualification and the qualifiers used should be documented in the Data Validation Memorandum.
Interference Check Sample- ICP-AES				
☑	☐	☐	Check raw data. Were the ICS results accurately reported on the tabulated forms? Confirm that results equal to or below the negative MDL are also reported on the forms.	If there are any transcription and/or calculation errors, then the validator should contact the laboratory to obtain corrected raw data and forms. If errors greater than 10% are detected, then the validator should perform a more comprehensive review to determine the magnitude of the problem. If the problem is extensive, then the validator should have the laboratory requantitate and resubmit all corrected raw data and forms. If a discrepancy remains unresolved, the validator must use professional judgment to decide which value is accurate. Under these circumstances, the validator may determine that the sample data should be qualified or rejected. A discussion of the rationale for data qualification and the qualifiers used should be documented in the Data Validation Memorandum.
☑	☐	☐	Check and recalculate the ICS percent recovery for at least one analyte per each pair of ICSA/ICSAB. Were the recalculated values within ±10% of the reported value?	

INORGANICS
TAL METALS (including mercury)
REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER III Checklist

YES NO NA	Action
Interference Check Sample- ICP-MS	
☐ ☐ ☑ Were the ICS solutions obtained from a source providing certified solutions? If the ICS solution was prepared by the laboratory, verify that the required concentrations of analytes and interferents were used. Not provided by Lab	If the ICS solution was not obtained from a source providing certified solutions or if the required analytes and interferents were not used to prepare the ICS solutions at the required concentrations, then the validator should use professional judgment to determine if sample qualification is required.
☑ ☐ ☐ Check raw data. Were the ICS results accurately reported on the tabulated forms? Confirm that results equal to or below the negative MDL are also reported on the forms. ☑ ☐ ☐ Check and recalculate the ICS percent recovery for at least one analyte per each pair of ICSA/ICSAB. Do the calculated values agree within ±10% of the reported value.	If any transcription and/or calculation errors are detected, perform a more comprehensive review to determine the magnitude of the problem. If the problem is extensive, then the validator should have the laboratory requantitate and resubmit all corrected raw data and forms. If a discrepancy remains unresolved, the validator must use professional judgment to decide which value is accurate. Under these circumstances, the validator may determine that the sample data should be qualified or rejected. A discussion of the rationale for data qualification and the qualifiers used should be documented in the Data Validation Memorandum.
ICP-MS - Internal Standards	
☑ ☐ ☐ Check raw data to verify that IS relative intensities are accurately reported on the tabulated forms. Recalculate the internal standard percent relative intensities for each internal standard in at least one sample. Do the recalculated value agrees within ±10% of the reported value?	If errors greater than 10% are detected in the percent relative intensity calculations, then the validator should perform a more comprehensive review to determine the magnitude of the problem. If the problem is extensive, then the validator should have the laboratory requantitate and resubmit all corrected raw data and forms. If a discrepancy remains unresolved, the validator must use professional judgment to decide which value is accurate.
Matrix Spikes	
☑ ☐ ☐ Check and recalculate the analytical concentrations and percent recovery for at least one spiked analyte per method. Does the recalculated value agree within ±10% of the reported value?	**Follow action from ICP-MS - Internal Standards**

INORGANICS
TAL METALS (including mercury)
REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER III Checklist

YES NO NA	Action
Lab Duplicates ☐ ☐ ☑ Check and recalculate the analytical concentrations and RPD for at least one duplicate sample per analytical method. Does the recalculated value agree within ±10% of the reported value? Not Analyzed	If any transcription and/or calculation errors are detected, perform a more comprehensive review to determine the magnitude of the problem. If the problem is extensive, then the validator should have the laboratory requantitate and resubmit all corrected raw data and forms. If a discrepancy remains unresolved, the validator must use professional judgment to decide which value is accurate. Under these circumstances, the validator may determine that the sample data should be qualified or rejected. A discussion of the rationale for data qualification and the qualifiers used should be documented in the Data Validation Memorandum.
Field Duplicates ☐ ☐ ☑ Check and recalculate the analytical concentrations for at least one positive detect and one sample quantitation limit (for a diluted sample or soil sample) for each analytical method in each field duplicate sample. Were errors detected? Not analyzed	If calculation and/or transcription errors are detected, then the validator should follow the procedures outlined in Section INORG-XIV (Analyte Quantitation and Reported Quantitation Limits), D.1-D.3.
Serial Dilutions ☑ ☐ ☐ Check and recalculate the analytical concentrations and percent differences for at least one analyte per analytical method. Verify that the recalculated values and % differences agree within ±10% of the reported values. Confirm that the laboratory used the appropriate method criteria. Are values within criteria?	**Follow action from ICP-MS - Internal Standards**

INORGANICS
TAL METALS (including mercury)
REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER III Checklist

YES NO NA	Action
Sensitivity Check	
☑ ☐ ☐ Was the MDL study was generated in accordance with the method and 40 CFR Part 136, App. B? Were a minimum of seven replicates for each matrix of interest prepared and analyzed?	If the required MDL study was not performed at all or was not performed according to the method or the CFR criteria, then the validator should evaluate the LFB data, if available, to determine the action to be taken. See Table INORG-XII-1. If no LFB data are available, then the validator should use professional judgment to assess the impact of analytical sensitivity on data quality. The results of other low level standards (e.g., Quantitation Limit Check Standard) should be evaluated and appropriate action taken. (See Section III, Calibrations.)
☑ ☐ ☐ For ICP-MS, do the internal standard responses meet QC acceptance criteria?	If the MDL study reveals that a target analyte has a detection limit greater than the method-required quantitation limit, then the validator should evaluate the LFB data.
☑ ☐ ☐ Check and recalculate the MDL value for at least one analyte per MDL study per method. Do the recalculated values agree within ±10% of the reported results? (Note: The MDL study raw data may not be provided with the data packages and may not be readily available to allow for verification or recalculation, as in the case of the CLP SOWs.) Checked Aqueous MDL Analyzed 3/10/11, 2/9/11, MDL Verification 2/15/12	If any transcription and/or calculation errors are detected, perform a more comprehensive review to determine the magnitude of the problem. If the problem is extensive, the validator should have the laboratory requantitate and resubmit all corrected raw data and forms. If a discrepancy remains unresolved, the validator must use professional judgment to decide which value is accurate. Under these circumstances, the validator may determine that the sample data should be qualified or rejected. A discussion of the rationale for data qualification and the qualifiers used should be documented in the Data Validation Memorandum.
Lab Control Samples	
☑ ☐ ☐ Check and recalculate the percent recovery for at least one analyte per method per LCS. Do the recalculated values agree within ±10% of the reported result?	If any transcription and/or calculation errors are detected, perform a more comprehensive review to determine the magnitude of the problem. If the problem is extensive, the validator should have the laboratory requantitate and resubmit all corrected raw data and forms. If a discrepancy remains unresolved, the validator must use professional judgment to decide which value is accurate.

INORGANICS
TAL METALS (including mercury)
REGION I VALIDATION CHECKLIST for
OLIN CHEMICAL SUPERFUND SITE
Criteria and Qualifiers: Region I Guidelines (11/08)

TIER III Checklist

YES NO NA	Action
PE Samples	
☐ ☐ ☑ Were PES analytes with in acceptance criteria? NO PES in data set	If more than half of the PES analytes for a particular method are high or low, then the validator should check the raw data and/or contact the laboratory to verify that the PE sample was prepared according to the PE instructions (if applicable). Check also that the appropriate PE instructions (for that PE concentration level) were sent to the laboratory.
☐ ☐ ☑ Check and recalculate the analytical concentrations for at least one analyte per method per PES. Do the recalculated values agree within ±10% of the reported result?	If any transcription and/or calculation errors are detected, perform a more comprehensive review to determine the magnitude of the problem. If the problem is extensive, the validator should have the laboratory requantitate and resubmit all corrected raw data and forms. If a discrepancy remains unresolved, the validator must use professional judgment to decide which value is accurate. Under these circumstances, the validator may determine that the sample data should be qualified or rejected.
Sample Quantitation	
☑ ☐ ☐ Recalculate from the raw data the concentrations for at least one positive detect and one sample quantitation limit (for a diluted sample or a soil sample) for each method, in every field sample. Were the laboratory-reported sample results accurately calculated according to the method?	If incorrect values, equations or factors have been used to calculate sample results and/or sample quantitation limits, then the validator should have the laboratory requantitate and resubmit all corrected raw data and forms.
☑ ☐ ☐ Verify that the concentrations for positive detects and sample quantitation limits have been adjusted to reflect sample dilutions, concentrations, sample preparation factors, and dry weight factors that are not accounted for in the method. Were results accurately reported?	If the concentrations for positive detects and/or sample quantitation limits were not correctly adjusted for sample dilutions, concentrations, preparation methods, or dry weight factors, then the validator should have the laboratory requantitate and resubmit all corrected raw data and forms.

Validator's Signature: [signature]

Date: 2/28/13

WinHg Database 1.1

File Utility Help

RN⇩ RN⇧ ?

Protocol hgppb | BUSY | Dataset/Proto H12202W1/hgppb

L2

12/20/11

Protocol | Line info | Cal Curve | Report | Ctrl Chart | Viewer

Reset

Calib Coeffs

New Cal

Update Coeffs

Spike Coeffs

A

B 1.25947e-5

C -4.34772e-2

rho .999986

☑ Calibrated

☑ Accepted

Accept

Type Linear

Rel. Abs. 796938

Accepted

New

Include S8 Rep 1 2 3 4 5

Conc. 10.0

S	Conc.	Calc.	Dev.	Mean	SD or %RSD	Rep 1	Rep 2	Rep 3
01	.00000	-.019	-.019	1978	968	2998	1865	1072
02	.20000	.188	-.012	18376	19.98%	14137	20504	20488
03	1.0000	1.00	.001	82909	2.23%	83039	84689	80999
04	2.0000	2.04	.039	165384	1.22%	167715	164238	164199
05	5.0000	5.00	-.003	400174	0.53%	398092	402325	400106
06	10.000	9.99	-.006	796938	0.15%	797885	797368	795562

96799

Ready CAP NUM

Cal: H12202C1

Run: H12202W1

Batches: 96744
96746

Line R^2 calculated on Excel Sheet See attached excel

2/28/13 TC

ICP-MS Report

Sample ID: ICV-1115695

Sample Date/Time: Wednesday, December 26, 2012 11:46:35
Sample Type: Sample
Sample Description:
Sample File: C:\Elandata\Sample\e122612a.sam
Method File: C:\Elandata\Method\A 6020-200.8 FULL LIST with CRI ICSA ICSAB -- Br79 add for Se eval 11-1:

	Analyte	Mass	Meas. Intensity	Conc. Mean	Conc. SD	Conc. RSD	Units
>	Li-6	6	491246				ug/L
	Li	7	111171	25.0279	1.2251	4.89	ug/L
	Be	9	21350	25.8568	0.9953	3.85	ug/L
>	Sc	45	746472				ug/L
	V	51	249049	25.3460	0.9423	3.72	ug/L
	Cr	52	224656	25.4000	0.8383	3.30	ug/L
	Mn	55	354451	24.5448	1.0088	4.11	ug/L
	Co	59	264002	24.4422	0.5537	2.27	ug/L
	Ni	60	56312	24.7073	0.2599	1.05	ug/L
	Cu	63	128348	24.9336	0.2672	1.07	ug/L
	Zn	66	39258	23.9256	0.3246	1.36	ug/L
>	Ge	72	405816				ug/L
	As	75	41904	24.4010	0.1596	0.65	ug/L
	Br	79	460				ug/L
	Se	82	4070	24.6993	0.6560	2.66	ug/L
	Kr	82	407				ug/L
	Kr	83	173				ug/L
	Kr	84	472				ug/L
	Kr	86	53879				ug/L
	Sr	88	513241	24.3341	0.8404	3.45	ug/L
>	Y	89	2792813				ug/L
	Mo	98	125463	24.7649	0.4109	1.66	ug/L
	Ag	107	214009	24.8268	0.8671	3.49	ug/L
	Cd	111	55230	24.8905	0.6605	2.65	ug/L
>	In	115	1445972				ug/L
	Sn	118	144899	22.9327	0.4125	1.80	ug/L
	Sb	121	203275	26.9523	0.3670	1.36	ug/L
	Ba	135	48749	25.1680	0.4479	1.78	ug/L
>	Tb	159	4050598				ug/L
	Ti	205	537332	25.6822	0.3292	1.28	ug/L
	Pb	208	723311	25.0891	1.0784	4.30	ug/L
>	Bi	209	2609919				ug/L

ICV check for Copper

ug/L
24.9 instrument
25.06 excel calculation
ok ✓

Sample ID: ICV-1115695
Report Date/Time: Thursday, December 27, 2012 09:31:57
Page 1

TC
2/28/13

Sample Name: MB 480-97039/1-A Acquired: 12/21/2012 18:12:45 Type: Unk
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00056**	**.01880**	**-.00102**	**.00148**	**.00004**	**.00001**	**.02136**	**-.00010**	**.00009**
Stddev	.00096	.00324	.00357	.00004	.00001	.00005	.00071	.00002	.00001
%RSD	171.91	17.242	350.43	2.6555	21.916	358.08	3.3454	16.587	9.8211
#1	.00123	.01651	-.00354	.00145	.00005	.00005	.02086	-.00009	.00008
#2	-.00012	.02110	.00150	.00150	.00003	-.00002	.02187	-.00012	.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00034**	**.00019**	**.00171**	**-.04740**	**.00289**	**.00185**	**.00508**	**.00029**	**-.00011**
Stddev	.00008	.00010	.00322	.02837	.00094	.00160	.00161	.00002	.00000
%RSD	22.797	50.482	187.88	59.857	32.382	86.401	31.777	8.1107	3.0163
#1	.00039	.00026	.00399	-.02734	.00355	.00298	.00394	.00028	-.00011
#2	.00028	.00012	-.00056	-.06746	.00223	.00072	.00622	.00031	-.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Line	589.592 { 57}	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}
IS Ref	(Y_3774)	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.07094**	**.00021**	**-.00044**	**F .0052**	**.00002**	**-.00041**	**.00103**	**-.00002**	**.00025**
Stddev	.00657	.00009	.00041	.0003	.00002	.00417	.00734	.00050	.00007
%RSD	9.2559	43.430	94.594	4.773	100.79	1007.4	714.78	2726.2	26.260
#1	.07559	.00014	-.00014	.0051	.00004	-.00336	-.00416	-.00037	.00020
#2	.06630	.00027	-.00073	.0054	.00001	.00253	.00621	.00034	.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				.0030					
Low Limit				-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Line	334.904 {101}	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm	ppm
Avg	**.00040**	**-.00022**	**.00005**	**.00072**
Stddev	.00020	.00173	.00013	.00006
%RSD	48.688	805.04	262.35	8.2805
#1	.00054	.00101	.00014	.00068
#2	.00026	-.00144	-.00004	.00076
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**4131.6**	**7261.7**	**64999.**	**9200.9**
Stddev	6.6	5.2	197.	33.6
%RSD	.15966	.07224	.30358	.36477
#1	4126.9	7258.0	65139.	9224.6
#2	4136.3	7265.4	64860.	9177.2

Method Blank
Al ND ✓

2/28/13
TC

Sample Name: 480-30497-G-1-D Acquired: 12/21/2012 18:21:42 Type: Unk
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00099**	**.21270**	**.00205**	**.04302**	**.04858**	**.00008**	**191.32**	**.00008**	**.00119**
Stddev	.00007	.02635	.00082	.00110	.00008	.00007	1.67	.00001	.00017
%RSD	6.8204	12.388	39.838	2.5586	.16762	91.510	.87328	16.494	14.458
#1	.00094	.23133	.00263	.04380	.04852	.00013	190.14	.00009	.00131
#2	.00103	.19406	.00147	.04225	.04863	.00003	192.50	.00007	.00107
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00853**	**.00253**	**.42581**	**7.6342**	**9.5801**	**.00709**	**12.608**	**.70095**	**.00026**
Stddev	.00013	.00016	.00096	.1025	.0871	.00096	.035	.00058	.00022
%RSD	1.5249	6.3287	.22470	1.3420	.90867	13.556	.28063	.08240	85.998
#1	.00862	.00242	.42513	7.5617	9.5185	.00641	12.633	.70055	.00010
#2	.00843	.00264	.42648	7.7066	9.6416	.00777	12.583	.70136	.00041
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Line	818.326 { 41}	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}
IS Ref	(Y_3774)	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**68.303**	**.00526**	**.00044**	F **183.0**	**-.00025**	**.00450**	**4.2990**	**-.00003**	**.30129**
Stddev	.577	.00029	.00067	.1	.00011	.00080	.0327	.00024	.00411
%RSD	.84538	5.5891	151.14	.0507	45.237	17.843	.76068	679.88	1.3656
#1	67.895	.00505	.00092	183.0	-.00017	.00506	4.2759	.00013	.29838
#2	68.712	.00547	-.00003	182.9	-.00033	.00393	4.3222	-.00020	.30420
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				10.00					
Low Limit				-.0100					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Line	334.904 {101}	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm	ppm
Avg	**.00496**	**.00098**	**.00052**	**.03986**
Stddev	.00008	.00132	.00012	.00000
%RSD	1.5394	135.10	23.623	.00776
#1	.00502	.00191	.00043	.03986
#2	.00491	.00004	.00061	.03986
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3615.0**	**6714.0**	**61834.**	**8841.8**
Stddev	4.5	2.7	127.	37.4
%RSD	.12420	.03959	.20514	.42244
#1	3611.9	6712.2	61924.	8868.2
#2	3618.2	6715.9	61744.	8815.4

Sample SW-SD-1

Al reported @ 210 ppb

OK ✓

TC
2/28/13

Sample Name: LCS 480-97039/2-A Acquired: 12/21/2012 18:15:02 Type: Unk
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.04979**	**10.377**	**.20388**	**.20639**	**.19614**	**.22055**	**10.621**	**.20245**	**.20802**
Stddev	.00058	.013	.00067	.00058	.00113	.00040	.042	.00170	.00070
%RSD	1.1654	.12936	.33017	.28260	.57388	.18139	.39245	.84112	.33560
#1	.04938	10.386	.20436	.20680	.19535	.22083	10.650	.20366	.20851
#2	.05020	10.367	.20341	.20598	.19694	.22027	10.591	.20125	.20752
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20220**	**.20079**	**10.518**	**10.484**	**9.6796**	**.21469**	**9.7930**	**.19878**	**.20768**
Stddev	.00143	.00172	.051	.046	.0495	.00089	.0239	.00030	.00158
%RSD	.70496	.85488	.48591	.44292	.51090	.41590	.24448	.15107	.75866
#1	.20120	.19958	10.554	10.517	9.7146	.21533	9.7760	.19857	.20880
#2	.20321	.20200	10.482	10.451	9.6447	.21406	9.8099	.19899	.20657
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Line	589.592 { 57}	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}
IS Ref	(Y_3774)	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**10.624**	**.20702**	**.20733**	**F .0018**	**.20557**	**.20044**	**10.272**	**.20088**	**.21270**
Stddev	.067	.00010	.00001	.0013	.00120	.00051	.082	.00126	.00164
%RSD	.62668	.04592	.00705	73.78	.58393	.25526	.79351	.62782	.77097
#1	10.671	.20709	.20734	.0009	.20642	.20008	10.330	.20177	.21386
#2	10.577	.20696	.20732	.0028	.20472	.20080	10.215	.19999	.21154
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				11.50					
Low Limit				8.500					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Line	334.904 {101}	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm	ppm
Avg	**.19855**	**.20721**	**.19914**	**.20909**
Stddev	.00112	.00366	.00186	.00116
%RSD	.56473	1.7669	.93330	.55642
#1	.19776	.20980	.19783	.20827
#2	.19934	.20462	.20046	.20991
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3933.7**	**7151.5**	**64861.**	**9020.8**
Stddev	10.4	26.4	322.	37.7
%RSD	.26522	.36965	.49617	.41756
#1	3926.3	7132.8	65089.	8994.2
#2	3941.1	7170.2	64634.	9047.4

Al
LCS check

$\frac{10377}{10000} = 104\%$

2/28/13
TC

Sample Name: ICV-1120773 Acquired: 12/21/2012 14:10:39 Type: QC
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.37297**	**18.876**	**.36326**	**.36682**	**.37762**	**.38159**	**19.133**	**.36648**	**.36038**	**.36966**	**.36858**	**18.522**	**19.196**
Stddev	.00403	1.080	.00279	.00248	.00253	.02042	1.031	.00216	.00165	.00229	.00207	.997	1.007
%RSD	1.0808	5.7209	.76914	.67735	.66917	5.3502	5.3901	.58834	.45695	.61857	.56036	5.3817	5.2474
#1	.37012	18.112	.36128	.36858	.37583	.36715	18.404	.36801	.36154	.36805	.36712	17.818	18.483
#2	.37582	19.639	.36523	.36507	.37940	.39603	19.862	.36496	.35921	.37128	.37005	19.227	19.908
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**18.197**	**.38163**	**18.023**	**.37490**	**.36904**	**19.169**	**.36223**	**.36426**	**18.13**	**.37132**	**.36503**	**19.291**	**.37934**
Stddev	.695	.02296	.145	.00341	.00288	.983	.00180	.00186	.08	.00199	.00015	1.038	.00101
%RSD	3.8166	6.0155	.80540	.90940	.78143	5.1302	.49584	.50992	.4324	.53573	.04070	5.3815	.26558
#1	17.706	.36540	17.920	.37249	.37108	18.473	.36350	.36557	18.19	.37272	.36493	18.557	.38005
#2	18.688	.39786	18.125	.37731	.36700	19.864	.36096	.36294	18.08	.36991	.36514	20.025	.37862
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.38118**	**.37073**	**.36957**	**.36837**	**.37070**
Stddev	.01956	.00356	.00241	.00191	.00340
%RSD	5.1326	.96101	.65177	.51804	.91853
#1	.36735	.36821	.36786	.36702	.36829
#2	.39502	.37325	.37127	.36972	.37311
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value					
Range					

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3728.4**	**6839.0**	**60834.**	**8928.5**
Stddev	8.9	14.8	350.	346.5
%RSD	.23779	.21681	.57583	3.8805
#1	3722.1	6828.6	61082.	9173.5
#2	3734.6	6849.5	60587.	8683.5

ICV Cal Check

Al

$\frac{18.87 ppm}{18.8 (true)} = 100.3\%$

2/28/13
TC

Sample Name: ICB-1118274 Acquired: 12/21/2012 14:12:49 Type: QC
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00033**	**.00205**	**-.00133**	**.00062**	**.00002**	**.00006**	**.00009**	**-.00010**	**-.00006**	**.00055**	**-.00010**	**.00320**	**.03145**
Stddev	.00023	.00777	.00233	.00009	.00002	.00000	.00067	.00005	.00005	.00011	.00003	.00524	.00233
%RSD	68.227	378.29	176.12	14.976	106.05	.70050	774.10	55.539	83.232	20.083	30.879	163.77	7.4131
#1	.00017	.00755	-.00298	.00069	.00003	.00006	-.00038	-.00006	-.00002	.00047	-.00008	-.00051	.03310
#2	.00049	-.00344	.00033	.00056	.00000	.00006	.00056	-.00013	-.00009	.00063	-.00012	.00690	.02980
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00228**	**-.00098**	**.00410**	**-.00010**	**.00024**	**-.00550**	**-.00008**	**.00059**	F **.0031**	**.00060**	**.00030**	**.01703**	**.00032**
Stddev	.00043	.00036	.00320	.00007	.00025	.00450	.00042	.00146	.0026	.00064	.00216	.00109	.00028
%RSD	18.844	36.444	77.934	74.320	103.88	81.875	519.46	247.98	81.91	106.42	709.84	6.4006	88.721
#1	.00259	-.00123	.00637	-.00005	.00006	-.00869	-.00038	-.00044	.0049	.00015	.00183	.01780	.00012
#2	.00198	-.00073	.00184	-.00015	.00041	-.00232	.00022	.00163	.0013	.00106	-.00122	.01626	.00052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									.0030				
Low Limit									-.0040				

Elem	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**.00025**	**.00121**	**-.00011**	**.00018**
Stddev	.00010	.00015	.00079	.00029	.00030
%RSD	291.99	59.386	65.505	256.27	173.60
#1	.00011	.00015	.00177	-.00032	.00039
#2	-.00004	.00036	.00065	.00009	-.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**4044.9**	**7027.0**	**61090.**	**9240.6**
Stddev	7.6	5.7	874.	51.4
%RSD	.18842	.08045	1.4304	.55650
#1	4050.3	7031.0	61708.	9204.2
#2	4039.5	7023.0	60472.	9277.0

ICB

2/28/12
TC

Sample Name: CCV Acquired: 12/21/2012 18:28:26 Type: QC
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49361**	**25.457**	**.49574**	**.49387**	**.52422**	**.51355**	**26.238**	**.49229**	**.49851**	**.49655**	**.50070**	**24.847**	**25.629**
Stddev	.00724	.377	.00215	.00202	.00589	.00780	.362	.00194	.00187	.00626	.00416	.389	.205
%RSD	1.4672	1.4818	.43389	.40840	1.1245	1.5198	1.3781	.39461	.37605	1.2609	.83009	1.5657	.80113
#1	.49873	25.724	.49726	.49529	.52838	.51906	26.494	.49366	.49983	.50097	.50364	25.123	25.774
#2	.48849	25.190	.49422	.49244	.52005	.50803	25.983	.49091	.49718	.49212	.49776	24.572	25.484
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**25.194**	**.51637**	**24.079**	**.49868**	**.48704**	**25.515**	**.49889**	**.50522**	**24.33**	**.49649**	**.50597**	**24.412**	**.50897**
Stddev	.456	.00759	.322	.00578	.00233	.307	.00219	.00159	.07	.00054	.00139	.269	.00061
%RSD	1.8080	1.4693	1.3381	1.1589	.47831	1.2029	.43880	.31428	.3046	.10887	.27421	1.1000	.11925
#1	25.516	.52173	24.307	.50277	.48869	25.732	.50044	.50634	24.38	.49611	.50499	24.602	.50940
#2	24.872	.51100	23.851	.49459	.48539	25.298	.49735	.50410	24.27	.49687	.50695	24.222	.50854
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.52101**	**.49659**	**.49485**	**.48788**	**.49757**
Stddev	.00624	.00790	.00030	.00623	.00816
%RSD	1.1971	1.5901	.06097	1.2765	1.6394
#1	.52542	.50217	.49464	.49229	.50333
#2	.51660	.49100	.49507	.48348	.49180
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value					
Range					

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3766.1**	**6945.1**	**61895.**	**8837.1**
Stddev	8.4	19.2	559.	97.7
%RSD	.22307	.27587	.90267	1.1055
#1	3760.1	6931.5	61500.	8768.0
#2	3772.0	6958.6	62290.	8906.2

Al CCV check

$\frac{25.4}{25} = 102\%$

2/28/13
TC

Sample Name: 480-30497-G-3-C MS Acquired: 12/21/2012 18:37:22 Type: Unk
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05156**	**12.065**	**.20613**	**.21908**	**.21336**	**.21045**	**31.716**	**.20487**	**.21925**
Stddev	.00037	.012	.00001	.00014	.00022	.00075	.149	.00050	.00015
%RSD	.72577	.10339	.00268	.06579	.10180	.35549	.47064	.24587	.06789
#1	.05183	12.056	.20613	.21918	.21351	.20992	31.610	.20523	.21914
#2	.05130	12.073	.20612	.21898	.21320	.21098	31.821	.20452	.21935
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48390**	**.21013**	**11.382**	**11.389**	**13.097**	**.21482**	**13.230**	**.70267**	**.20564**
Stddev	.00147	.00047	.038	.092	.064	.00263	.075	.00238	.00024
%RSD	.30286	.22170	.33328	.81078	.49009	1.2225	.56809	.33886	.11670
#1	.48494	.21046	11.356	11.324	13.051	.21296	13.283	.70436	.20581
#2	.48286	.20980	11.409	11.454	13.142	.21668	13.177	.70099	.20547
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Line	818.326 { 41}	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}
IS Ref	(Y_3774)	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**60.145**	**.21477**	**.20738**	**F 44.11**	**.20656**	**.20879**	**13.089**	**.20342**	**.25870**
Stddev	.392	.00002	.00051	.04	.00085	.00080	.005	.00016	.00159
%RSD	.65115	.00908	.24715	.0832	.41223	.38218	.03991	.08079	.61593
#1	59.868	.21478	.20775	44.08	.20595	.20935	13.093	.20353	.25757
#2	60.422	.21475	.20702	44.14	.20716	.20822	13.086	.20330	.25983
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				10.00					
Low Limit				-.0100					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Line	334.904 {101}	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm	ppm
Avg	**.20033**	**.20612**	**.20439**	**.23588**
Stddev	.00021	.00420	.00107	.00144
%RSD	.10679	2.0390	.52183	.60986
#1	.20048	.20315	.20515	.23690
#2	.20018	.20909	.20364	.23487
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3750.9**	**6892.8**	**62083.**	**9100.8**
Stddev	7.4	2.1	25.	25.5
%RSD	.19846	.03118	.03962	.27974
#1	3756.2	6894.3	62065.	9118.8
#2	3745.6	6891.3	62100.	9082.8

MS spike check

12065 ug/L − 1800

$\frac{10265}{10000}$ = 103% Recovery

TC
2/28/13

Sample Name: 480-30497-G-3-D MSD Acquired: 12/21/2012 18:39:34 Type: Unk
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05332**	**12.158**	**.21270**	**.22405**	**.22043**	**.21309**	**32.227**	**.20960**	**.22374**
Stddev	.00020	.114	.00054	.00077	.00011	.00230	.329	.00121	.00098
%RSD	.37587	.94069	.25449	.34158	.05044	1.0793	1.0195	.57683	.43815
#1	.05346	12.077	.21309	.22459	.22051	.21146	31.994	.21046	.22443
#2	.05318	12.239	.21232	.22351	.22035	.21471	32.459	.20875	.22305
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49920**	**.21650**	**11.517**	**11.503**	**13.250**	**.21882**	**13.706**	**.73091**	**.21148**
Stddev	.00359	.00011	.112	.101	.056	.00223	.007	.00079	.00109
%RSD	.71855	.05265	.97074	.87525	.42409	1.0190	.05051	.10869	.51677
#1	.50173	.21642	11.438	11.432	13.210	.21724	13.711	.73035	.21226
#2	.49666	.21658	11.596	11.574	13.290	.22040	13.701	.73147	.21071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Line	818.326 { 41}	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}
IS Ref	(Y_3774)	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**61.667**	**.21939**	**.21051**	**F 45.37**	**.21194**	**.21369**	**13.435**	**.20859**	**.26207**
Stddev	.299	.00108	.00218	.25	.00055	.00532	.089	.00149	.00300
%RSD	.48563	.49389	1.0362	.5464	.25794	2.4883	.66594	.71352	1.1442
#1	61.455	.22015	.21206	45.54	.21156	.21745	13.372	.20964	.25995
#2	61.879	.21862	.20897	45.19	.21233	.20993	13.499	.20753	.26419
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				10.00					
Low Limit				-.0100					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Line	334.904 {101}	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm	ppm
Avg	**.20597**	**.20923**	**.21179**	**.23827**
Stddev	.00037	.00182	.00050	.00115
%RSD	.18159	.87143	.23798	.48085
#1	.20624	.21052	.21214	.23908
#2	.20571	.20794	.21143	.23746
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3723.0**	**6849.1**	**61135.**	**9090.0**
Stddev	10.4	22.2	48.	41.0
%RSD	.28055	.32463	.07841	.45068
#1	3715.6	6833.4	61169.	9119.0
#2	3730.4	6864.9	61101.	9061.0

Sample

12158 ug/L − 1800 ug/L

10,000 ug/L

104% Rec

TC
2/28/13

Sample Name: CRI-1107665 Acquired: 12/21/2012 20:51:42 Type: QC
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00305**	**.21460**	**.00923**	**.02348**	**.00196**	**.00216**	**.58450**	**.00106**	**.00395**	**.00462**	**.01106**	**.04987**
Stddev	.00071	.01674	.00191	.00015	.00004	.00003	.00718	.00005	.00015	.00035	.00050	.00164
%RSD	23.247	7.8022	20.743	.61798	1.8058	1.5634	1.2281	4.6070	3.9064	7.6038	4.5584	3.2852
#1	.00255	.20276	.00787	.02338	.00199	.00218	.57943	.00103	.00406	.00437	.01142	.04871
#2	.00356	.22644	.01058	.02358	.00194	.00214	.58958	.00110	.00384	.00487	.01071	.05103
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.43137**	**.40763**	**.03425**	**.21119**	**.00284**	**.01024**	**.99601**	**.00978**	**.00450**	F **.0563**	**.01926**	**.01457**
Stddev	.00213	.00247	.00124	.00123	.00007	.00009	.00340	.00023	.00069	.0005	.00006	.00097
%RSD	.49312	.60547	3.6097	.58398	2.4652	.83363	.34097	2.3711	15.358	.9147	.28591	6.6675
#1	.43288	.40589	.03512	.21207	.00279	.01030	.99841	.00994	.00401	.0566	.01922	.01525
#2	.42987	.40938	.03338	.21032	.00289	.01018	.99361	.00961	.00498	.0559	.01930	.01388
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
Value										.0030		
Range										50.00%		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52090**	W **.00575**	**.00541**	**.00511**	**.01835**	**.00470**	**.01113**
Stddev	.00826	.00026	.00010	.00007	.00013	.00015	.00025
%RSD	1.5849	4.5735	1.8804	1.3555	.69867	3.2880	2.2143
#1	.51507	.00594	.00548	.00516	.01844	.00459	.01130
#2	.52674	.00557	.00534	.00507	.01826	.00481	.01096
Check ?	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value		.01000					
Range		-30.000%					

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**4097.3**	**7046.2**	**64301.**	**8865.6**
Stddev	1.6	5.7	48.	1.2
%RSD	.03934	.08128	.07440	.01346
#1	4096.1	7050.3	64267.	8864.8
#2	4098.4	7042.2	64335.	8866.4

CRI check

$\frac{0.2146}{0.2} = 107.3\%$ OK

TC
2/28/13

Sample Name: ICSA-1101769 Acquired: 12/21/2012 20:54:03 Type: QC
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00059**	**495.98**	**.00290**	**-.00112**	**.00025**	**-.00004**	**478.81**	**-.00080**	**-.00075**	**.00279**	**.00297**	**179.00**	**-.05479**
Stddev	.00093	1.74	.00252	.00070	.00002	.00000	5.75	.00011	.00002	.00066	.00030	.61	.03365
%RSD	158.38	.35039	86.764	62.310	8.4237	5.8782	1.2010	13.683	2.7251	23.547	10.026	.34258	61.420
#1	.00125	494.75	.00112	-.00063	.00023	-.00004	474.74	-.00072	-.00077	.00325	.00276	178.56	-.03099
#2	-.00007	497.21	.00468	-.00161	.00026	-.00004	482.88	-.00088	-.00074	.00232	.00318	179.43	-.07858
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00215**	**.00615**	**502.05**	**.00135**	**-.00031**	**.00518**	**.00658**	**.00184**	F **-.1484**	**-.00870**	**.00498**	**.00636**	**.00141**
Stddev	.00047	.00074	1.24	.00011	.00047	.00396	.00016	.00035	.0029	.00612	.00413	.00352	.00064
%RSD	21.971	12.061	.24767	8.1502	151.07	76.516	2.4695	18.894	1.942	70.338	82.818	55.427	45.625
#1	.00248	.00562	502.93	.00143	-.00065	.00798	.00669	.00208	-.1463	-.01302	.00206	.00386	.00187
#2	.00181	.00667	501.17	.00127	.00002	.00238	.00646	.00159	-.1504	-.00437	.00790	.00885	.00096
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	None	Chk Pass
High Limit									.0060				
Low Limit									-.0060				

Elem	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00542**	**.00441**	**-.00288**	**-.00196**	**.00183**
Stddev	.00001	.00004	.00457	.00038	.00034
%RSD	.16111	.89748	158.78	19.149	18.627
#1	.00542	.00444	-.00611	-.00170	.00159
#2	.00541	.00438	.00035	-.00223	.00207
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3010.6**	**6061.5**	**54511.**	**8423.6**
Stddev	9.9	25.0	64.	76.4
%RSD	.32987	.41178	.11744	.90664
#1	3017.6	6079.2	54466.	8477.7
#2	3003.6	6043.9	54556.	8369.6

ICSA

$\frac{495}{500} = 99\%$

2/28/13
TC

Sample Name: ICSAB-1086099 Acquired: 12/21/2012 20:56:27 Type: QC
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2714
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.21726**	**507.59**	**.10882**	**.00099**	**.51501**	**.49276**	**474.72**	**1.0307**	**.51092**	**.49106**	**.54012**	**89.176**
Stddev	.00068	2.97	.00261	.00077	.00339	.00403	3.68	.0053	.00247	.00144	.00285	.272
%RSD	.31440	.58601	2.3960	78.331	.65794	.81776	.77425	.51024	.48381	.29407	.52704	.30546
#1	.21774	509.70	.11066	.00154	.51741	.49561	477.32	1.0270	.50917	.49003	.53810	89.369
#2	.21677	505.49	.10697	.00044	.51262	.48991	472.12	1.0344	.51267	.49208	.54213	88.983
Check ?	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.08297**	**.01361**	**.53993**	**522.09**	**.47838**	**-.00011**	**.08398**	**1.0014**	**.05451**	F **-.1312**	**.60484**	F **.06286**
Stddev	.01955	.00026	.00417	4.60	.00330	.00024	.00215	.0032	.00103	.0070	.00345	.00436
%RSD	23.564	1.8817	.77262	.88093	.69068	222.61	2.5624	.32038	1.8963	5.322	.57109	6.9388
#1	-.06915	.01379	.54288	518.84	.47605	.00006	.08246	.99913	.05378	-.1361	.60240	.06595
#2	-.09680	.01343	.53698	525.35	.48072	-.00027	.08550	1.0037	.05524	-.1262	.60728	.05978
Check ?	None	None	None	Chk Pass	Chk Pass	None	None	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Fail
Value										.2000		.05000
Range										-20.00%		20.000%

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.99525**	**.00062**	**.50316**	**.00410**	**.09643**	**.48688**	**.97263**
Stddev	.00782	.00054	.00482	.00006	.00158	.00376	.00333
%RSD	.78592	86.878	.95751	1.5416	1.6414	.77264	.34278
#1	.98972	.00024	.50657	.00415	.09755	.48422	.97027
#2	1.0008	.00100	.49976	.00406	.09531	.48954	.97498
Check ?	Chk Pass	None	None	None	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3035.7**	**6112.3**	**54239.**	**8469.3**
Stddev	4.7	10.2	323.	42.1
%RSD	.15361	.16677	.59570	.49668
#1	3039.0	6119.5	54468.	8439.6
#2	3032.4	6105.1	54011.	8499.1

ICSAB
Al = 507.5 / 500 = 101%

2/28/13
TC

ICP-MS Report

Sample ID: CCV-1114955

Sample Date/Time: Wednesday, December 26, 2012 14:27:14
Sample Type: Sample
Sample Description:
Sample File: C:\Elandata\Sample\e122612a.sam
Method File: C:\Elandata\Method\A 6020-200.8 FULL LIST with CRI ICSA ICSAB -- Br79 add for Se eval 11-1:

	Analyte	Mass	Meas. Intensity	Conc. Mean	Conc. SD	Conc. RSD	Units
>	Li-6	6	570537				ug/L
	Li	7	125137	23.9762	0.2429	1.01	ug/L
	Be	9	22932	23.9025	0.4872	2.04	ug/L
>	Sc	45	840724				ug/L
	V	51	279104	25.2077	0.8428	3.34	ug/L
	Cr	52	250525	25.1320	0.6554	2.61	ug/L
	Mn	55	397180	24.4091	1.2658	5.19	ug/L
	Co	59	296026	25.6920	0.7428	2.89	ug/L
	Ni	60	62142	25.5599	0.8603	3.37	ug/L
	Cu	63	141780	25.8239	0.1235	0.48	ug/L
	Zn	66	42836	24.4864	0.0738	0.30	ug/L
>	Ge	72	432920				ug/L
	As	75	45542	24.8624	0.2039	0.82	ug/L
	Br	79	10352				ug/L
	Se	82	4402	25.0366	0.4743	1.89	ug/L
	Kr	82	617				ug/L
	Kr	83	169				ug/L
	Kr	84	532				ug/L
	Kr	86	59415				ug/L
	Sr	88	557742	24.7046	0.4623	1.87	ug/L
>	Y	89	2988753				ug/L
	Mo	98	131691	25.2467	0.3107	1.23	ug/L
	Ag	107	223556	25.1854	0.4019	1.60	ug/L
	Cd	111	56841	24.8748	0.5063	2.04	ug/L
>	In	115	1488806				ug/L
	Sn	118	165087	25.3788	0.2773	1.09	ug/L
	Sb	121	190548	24.5369	0.2802	1.14	ug/L
	Ba	135	50493	25.7931	0.3617	1.40	ug/L
>	Tb	159	4094267				ug/L
	Tl	205	509130	24.0791	0.4460	1.85	ug/L
	Pb	208	685003	24.3117	0.3140	1.29	ug/L
>	Bi	209	2548407				ug/L

Cu CCV

$\frac{25.82}{25}$: 103%

Sample ID: CCV-1114955
Report Date/Time: Thursday, December 27, 2012 09:32:38
Page 1

TC
2/28/12
TC

ICP-MS Report

Sample ID: LCS 480-97040/2-A

Sample Date/Time: Wednesday, December 26, 2012 15:11:38
Sample Type: Sample
Sample Description:
Sample File: C:\Elandata\Sample\e122612a.sam
Method File: C:\Elandata\Method\A 6020-200.8 FULL LIST with CRI ICSA ICSAB -- Br79 add for Se eval 11-1:

	Analyte	Mass	Meas. Intensity	Conc. Mean	Conc. SD	Conc. RSD	Units
⌈>	Li-6	6	554832				ug/L
|	Li	7	104967	19.5215	0.1701	0.87	ug/L
⌊	Be	9	18924	20.2792	0.6233	3.07	ug/L
⌈>	Sc	45	838824				ug/L
|	V	51	242854	21.9610	0.4150	1.89	ug/L
|	Cr	52	217546	21.7669	0.1559	0.72	ug/L
⌊	Mn	55	336246	20.6494	0.3137	1.52	ug/L
⌈	Co	59	243288	21.6040	0.5316	2.46	ug/L
|	Ni	60	50803	21.3728	0.4676	2.19	ug/L
|	Cu	63	121298	22.5877	0.6779	3.00	ug/L
|	Zn	66	91108	53.9336	1.7814	3.30	ug/L
|>	Ge	72	423202				ug/L
|	As	75	36481	20.3484	0.2555	1.26	ug/L
|	Br	79	3961				ug/L
|	Se	82	3449	20.0871	0.6684	3.33	ug/L
|	Kr	82	401				ug/L
⌊	Kr	83	178				ug/L
⌈	Kr	84	569				ug/L
|	Kr	86	47837				ug/L
|	Sr	88	453760	21.0390	0.2714	1.29	ug/L
⌊>	Y	89	2853769				ug/L
⌈	Mo	98	108080	21.1946	0.2274	1.07	ug/L
|	Ag	107	164352	18.9397	0.2727	1.44	ug/L
|	Cd	111	48002	21.3867	0.2819	1.32	ug/L
|>	In	115	1455222				ug/L
|	Sn	118	134817	21.2000	0.2812	1.33	ug/L
⌊	Sb	121	163109	21.4880	0.3377	1.57	ug/L
⌈	Ba	135	42189	21.4466	0.7939	3.70	ug/L
|>	Tb	159	4114683				ug/L
⌊	Tl	205	435994	20.5229	0.8037	3.92	ug/L
⌈	Pb	208	591400	21.0191	0.3732	1.78	ug/L
⌊>	Bi	209	2544392				ug/L

Copper $\frac{22.5}{25} = 90\%$

LCS check

Sample ID: LCS 480-97040/2-A
Report Date/Time: Thursday, December 27, 2012 09:32:49
Page 1

2/28/13
T

ICP-MS Report

Sample ID: LCSD 480-97040/3-A

Sample Date/Time: Wednesday, December 26, 2012 15:17:13
Sample Type: Sample
Sample Description:
Sample File: C:\Elandata\Sample\e122612a.sam
Method File: C:\Elandata\Method\A 6020-200.8 FULL LIST with CRI ICSA ICSAB -- Br79 add for Se eval 11-1:

	Analyte	Mass	Meas. Intensity	Conc. Mean	Conc. SD	Conc. RSD	Units
>	Li-6	6	546002				ug/L
	Li	7	104654	19.8921	0.6920	3.48	ug/L
	Be	9	19016	20.7103	0.5133	2.48	ug/L
>	Sc	45	839080				ug/L
	V	51	238545	21.5597	0.6183	2.87	ug/L
	Cr	52	211056	21.0865	0.3858	1.83	ug/L
	Mn	55	329768	20.2371	0.2666	1.32	ug/L
	Co	59	241310	21.9258	0.3408	1.55	ug/L
	Ni	60	49841	21.4528	0.4001	1.87	ug/L
	Cu	63	117427	22.3664	0.3355	1.50	ug/L
	Zn	66	88409	53.5359	0.2670	0.50	ug/L
>	Ge	72	413530				ug/L
	As	75	35521	20.2776	0.1865	0.92	ug/L
	Br	79	3084				ug/L
	Se	82	3332	19.8564	0.8317	4.19	ug/L
	Kr	82	476				ug/L
	Kr	83	173				ug/L
	Kr	84	494				ug/L
	Kr	86	48637				ug/L
	Sr	88	458612	20.9166	0.6383	3.05	ug/L
>	Y	89	2901528				ug/L
	Mo	98	110050	21.5890	0.5089	2.36	ug/L
	Ag	107	166413	19.1766	0.0439	0.23	ug/L
	Cd	111	47992	21.3833	0.1353	0.63	ug/L
>	In	115	1455116				ug/L
	Sn	118	134999	21.2283	0.3047	1.44	ug/L
	Sb	121	167690	22.0954	0.2888	1.31	ug/L
	Ba	135	43064	22.5039	0.1015	0.45	ug/L
>	Tb	159	4000658				ug/L
	Tl	205	426790	20.6604	0.8906	4.31	ug/L
	Pb	208	588457	20.5712	0.1220	0.59	ug/L
>	Bi	209	2586488				ug/L

LCSD

Copper $\frac{22.3}{25}$ = 89% Rec ✓

Sample ID: LCSD 480-97040/3-A
Report Date/Time: Thursday, December 27, 2012 09:32:50
Page 1

2/28/13
TC

ICP-MS Report

Sample ID: 480-30497-G-1-E

Sample Date/Time: Wednesday, December 26, 2012 15:22:47
Sample Type: Sample
Sample Description:
Sample File: C:\Elandata\Sample\e122612a.sam
Method File: C:\Elandata\Method\A 6020-200.8 FULL LIST with CRI ICSA ICSAB -- Br79 add for Se eval 11-1;

	Analyte	Mass	Meas. Intensity	Conc. Mean	Conc. SD	Conc. RSD	Units
>	Li-6	6	507328				ug/L
	Li	7	38440	2.7645	0.2706	9.79	ug/L
	Be	9	41	0.0376	0.0111	29.44	ug/L
>	Sc	45	814460				ug/L
	V	51	4625	0.2811	0.0355	12.64	ug/L
	Cr	52	72052	6.9040	0.2389	3.46	ug/L
	Mn	55	10771629	693.1188	17.9610	2.59	ug/L
	Co	59	16985	1.6089	0.0568	3.53	ug/L
	Ni	60	26134	11.7666	0.3955	3.36	ug/L
	Cu	63	10010	1.8240	0.0041	0.23	ug/L
	Zn	66	65492	41.4379	0.3801	0.92	ug/L
>	Ge	72	394634				ug/L
	As	75	2807	1.5630	0.0563	3.60	ug/L
	Br	79	116048				ug/L
	Se	82	36	0.3013	0.0698	23.16	ug/L
	Kr	82	160				ug/L
	Kr	83	174				ug/L
	Kr	84	-3477				ug/L
	Kr	86	602048				ug/L
	Sr	88	5969316	299.0154	5.3568	1.79	ug/L
>	Y	89	2653331				ug/L
	Mo	98	944	0.1871	0.0155	8.28	ug/L
	Ag	107	217	0.0151	0.0013	8.70	ug/L
	Cd	111	2019	0.2441	0.0780	31.95	ug/L
>	In	115	1323307				ug/L
	Sn	118	464	0.0530	0.0079	14.96	ug/L
	Sb	121	3006	0.4336	0.0812	18.74	ug/L
	Ba	135	97213	52.1757	0.5000	0.96	ug/L
>	Tb	159	3898519				ug/L
	Tl	205	535	0.0251	0.0033	13.02	ug/L
	Pb	208	23730	0.8957	0.0102	1.14	ug/L
>	Bi	209	2329296				ug/L

Sample Check
see excel sheet

TC
2/28/13

ICP-MS Report

Sample ID: 480-30497-G-2-D MS

Sample Date/Time: Wednesday, December 26, 2012 15:56:04
Sample Type: Sample
Sample Description:
Sample File: C:\Elandata\Sample\e122612a.sam
Method File: C:\Elandata\Method\A 6020-200.8 FULL LIST with CRI ICSA ICSAB -- Br79 add for Se eval 11-1:

	Analyte	Mass	Meas. Intensity	Conc. Mean	Conc. SD	Conc. RSD	Units
>	Li-6	6	560042				ug/L
	Li	7	109706	20.5143	0.3620	1.76	ug/L
	Be	9	19378	20.5724	0.4513	2.19	ug/L
>	Sc	45	836755				ug/L
	V	51	260649	23.6449	0.3355	1.42	ug/L
	Cr	52	263742	26.6374	0.8753	3.29	ug/L
	Mn	55	2274728	142.2225	4.1069	2.89	ug/L
	Co	59	248545	22.4552	0.2013	0.90	ug/L
	Ni	60	56256	24.0821	0.7817	3.25	ug/L
	Cu	63	127900	24.2367	0.5812	2.40	ug/L
	Zn	66	107533	64.8559	0.4895	0.75	ug/L
>	Ge	72	415886				ug/L
	As	75	43948	24.9719	0.3789	1.52	ug/L
	Br	79	47808				ug/L
	Se	82	3485	20.6545	0.6272	3.04	ug/L
	Kr	82	483				ug/L
	Kr	83	179				ug/L
	Kr	84	1				ug/L
	Kr	86	204421				ug/L
	Sr	88	1879786	86.7221	0.7466	0.86	ug/L
>	Y	89	2878553				ug/L
	Mo	98	110466	22.3187	0.8743	3.92	ug/L
	Ag	107	158107	18.7673	0.4568	2.43	ug/L
	Cd	111	47067	21.6102	0.6821	3.16	ug/L
>	In	115	1413188				ug/L
	Sn	118	98718	15.9839	0.4676	2.93	ug/L
	Sb	121	164103	22.2657	0.3168	1.42	ug/L
	Ba	135	92324	48.9479	1.3805	2.82	ug/L
>	Tb	159	3948524				ug/L
	Tl	205	422345	20.7150	0.4346	2.10	ug/L
	Pb	208	654425	24.0249	1.0714	4.46	ug/L
>	Bi	209	2466698				ug/L

MS check

Copper $\frac{24.23 - 1.8}{25}$ = 90% ✓

TC
2/28/13

ICP-MS Report

Sample ID: ICSA-1118175

Sample Date/Time: Wednesday, December 26, 2012 12:03:09
Sample Type: Sample
Sample Description:
Sample File: C:\Elandata\Sample\e122612a.sam
Method File: C:\Elandata\Method\A 6020-200.8 FULL LIST with CRI ICSA ICSAB -- Br79 add for Se eval 11-1:

	Analyte	Mass	Meas. Intensity	Conc. Mean	Conc. SD	Conc. RSD	Units
>	Li-6	6	448310				ug/L
	Li	7	24858	-0.2362	0.1683	71.26	ug/L
	Be	9	15	0.0103	0.0027	26.51	ug/L
>	Sc	45	708147				ug/L
	V	51	4037	0.2825	0.0913	32.30	ug/L
	Cr	52	20842	1.7664	0.0238	1.34	ug/L
	Mn	55	28878	1.7730	0.0394	2.22	ug/L
	Co	59	15060	1.3637	0.0430	3.15	ug/L
	Ni	60	9560	4.0869	0.0740	1.81	ug/L
	Cu	63	12609	2.2388	0.0214	0.96	ug/L
	Zn	66	13542	7.7691	0.1236	1.59	ug/L
>	Ge	72	412235				ug/L
	As	75	857	0.3664	0.1173	32.02	ug/L
	Br	79	13938				ug/L
	Se	82	-287	-1.6310	0.1298	7.96	ug/L
	Kr	82	-1572				ug/L
	Kr	83	556				ug/L
	Kr	84	758				ug/L
	Kr	86	2903				ug/L
	Sr	88	11648	0.4982	0.0070	1.41	ug/L
>	Y	89	2560801				ug/L
	Mo	98	9905631	2110.6945	53.8238	2.55	ug/L
	Ag	107	1874	0.2221	0.0022	0.98	ug/L
	Cd	111	3405	0.9272	0.3285	35.43	ug/L
>	In	115	1340585				ug/L
	Sn	118	1021	0.1469	0.0016	1.07	ug/L
	Sb	121	3631	0.5153	0.0252	4.89	ug/L
	Ba	135	478	0.2364	0.0088	3.71	ug/L
>	Tb	159	3708497				ug/L
	Tl	205	778	0.0392	0.0015	3.72	ug/L
	Pb	208	6861	0.2479	0.0078	3.15	ug/L
>	Bi	209	2262360				ug/L

Trace contamination in manufacturers solution

TC
2/28/13

ICP-MS Report

Sample ID: ICSAB-1118176

Sample Date/Time: Wednesday, December 26, 2012 12:08:41
Sample Type: Sample
Sample Description:
Sample File: C:\Elandata\Sample\e122612a.sam
Method File: C:\Elandata\Method\A 6020-200.8 FULL LIST with CRI ICSA ICSAB -- Br79 add for Se eval 11-1:

	Analyte	Mass	Meas. Intensity	Conc. Mean	Conc. SD	Conc. RSD	Units
>	Li-6	6	445024				ug/L
	Li	7	23570	-0.6030	0.1493	24.76	ug/L
	Be	9	14	0.0087	0.0027	31.47	ug/L
>	Sc	45	687589				ug/L
	V	51	369910	40.9439	0.8814	2.15	ug/L
	Cr	52	174647	21.3019	0.4034	1.89	ug/L
	Mn	55	281822	21.1222	0.1285	0.61	ug/L
	Co	59	385845	35.9384	0.6380	1.78	ug/L
	Ni	60	87077	38.4521	0.5007	1.30	ug/L
	Cu	63	98442	19.1909	0.2821	1.47	ug/L
	Zn	66	40494	24.8474	0.6390	2.57	ug/L
>	Ge	72	403498				ug/L
	As	75	34058	19.9251	0.5456	2.74	ug/L
	Br	79	22502				ug/L
	Se	82	2963	18.1074	0.6953	3.84	ug/L
	Kr	82	-1289				ug/L
	Kr	83	574				ug/L
	Kr	84	767				ug/L
	Kr	86	2526				ug/L
	Sr	88	11519	0.4940	0.0130	2.64	ug/L
>	Y	89	2550536				ug/L
	Mo	98	9936344	2127.8502	71.8214	3.38	ug/L
	Ag	107	150803	18.9573	0.3628	1.91	ug/L
	Cd	111	21900	10.2459	0.3171	3.09	ug/L
>	In	115	1334228				ug/L
	Sn	118	1212	0.1807	0.0058	3.21	ug/L
	Sb	121	4115	0.5876	0.0224	3.82	ug/L
	Ba	135	526	0.2656	0.0106	3.98	ug/L
>	Tb	159	3678060				ug/L
	Ti	205	787	0.0400	0.0018	4.62	ug/L
	Pb	208	10031	0.3746	0.0091	2.43	ug/L
>	Bi	209	2263876				ug/L

$\frac{19.19}{20} = 96\%$

2/28/13
TC

Sample Name: 480-30497-G-3-B SD@5 Acquired: 12/21/2012 18:32:58 Type: Unk
Method: ICAP1(v396) Mode: CONC Corr. Factor: 1.000000
User: AMH Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00076**	**.35396**	**.00043**	**.00246**	**.00340**	**.00017**	**4.5230**	**-.00008**	**.00155**
Stddev	.00011	.01111	.00073	.00033	.00007	.00006	.0035	.00008	.00002
%RSD	14.438	3.1378	169.17	13.473	1.9353	34.911	.07762	100.67	.99871
#1	.00068	.36181	.00094	.00223	.00345	.00021	4.5206	-.00002	.00156
#2	.00084	.34611	-.00008	.00270	.00336	.00013	4.5255	-.00014	.00154
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mo2020
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05916**	**.00138**	**.29969**	**.21113**	**.22826**	**.00387**	**.69066**	**.10475**	**.00004**
Stddev	.00089	.00018	.00183	.00310	.00249	.00102	.00257	.00011	.00018
%RSD	1.4989	13.063	.61168	1.4667	1.0899	26.331	.37270	.10808	475.95
#1	.05978	.00126	.30098	.21332	.23002	.00315	.69248	.10483	-.00009
#2	.05853	.00151	.29839	.20894	.22650	.00459	.68884	.10467	.00017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Line	589.592 { 57}	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}
IS Ref	(Y_3774)	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**10.413**	**.00177**	**.00101**	**8.873**	**.00027**	**-.00118**	**.67197**	**.00020**	**.01224**
Stddev	.021	.00057	.00104	.016	.00008	.00179	.00511	.00017	.00028
%RSD	.20034	32.274	103.11	.1756	30.587	152.05	.76067	84.804	2.2541
#1	10.428	.00137	.00174	8.862	.00021	-.00245	.66836	.00008	.01243
#2	10.398	.00218	.00027	8.884	.00033	.00009	.67559	.00032	.01204
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ti3349	Tl1908	V_2924	Zn2062
Line	334.904 {101}	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm	ppm
Avg	**.00039**	**.00148**	**.00001**	**.00574**
Stddev	.00006	.00172	.00006	.00013
%RSD	15.369	116.05	565.63	2.2344
#1	.00035	.00027	-.00003	.00565
#2	.00043	.00270	.00005	.00584
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**4031.7**	**7042.2**	**63644.**	**9056.4**
Stddev	6.8	10.7	190.	26.0
%RSD	.16952	.15206	.29831	.28739
#1	4036.6	7049.7	63510.	9038.0
#2	4026.9	7034.6	63778.	9074.8

Serial Dilution check

Mg

.69066 x5 = 3453 mg/L

$\frac{3453}{\cancel{3300}\ 3250} - 1 = \cancel{4.6\%}$ 6.2 ✓

TC
2/28/13
JC

DATA VALIDATION MDL STUDY REVIEW - Tier 3 Check
OLIN November and December 2012 OU1/OU2 SW/SD
TestAmerican-Buffalo

Analyzed	Analyte	Units	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	MDL9	Average	Standard Deviation	*MDL (T*SD)	MDL reported by the lab
3/10/2011	Al	mg/L	0.12084	0.12533	0.11663	0.13673	0.15253	0.12924	0.12901			0.13004	0.011824	0.037	0.06mg/L from 2/15/12 check
3/10/2011	Cr	mg/L	0.00287	0.00275	0.00295	0.00247	0.00191	0.00296	0.00353			0.00278	0.000498	0.002	0.001mg/L from 2/15/12 check
3/10/2011	Zn	mg/L	0.00523	0.00533	0.0052	0.00524	0.00576	0.00504	0.00542			0.00532	0.000228	0.001	0.0017mg/L from 2/15/12 check

* = **Values for the Student T @ 99% CONFIDENCE**

# Replicates (n)	Degrees of Freedom (n-1)	0.990 value
1	0	---
2	1	31.821
3	2	6.965
4	3	4.541
5	4	3.747
6	5	3.365
7	6	3.143
8	7	2.998
9	8	2.896
10	9	2.821
11	10	2.764
12	11	2.718

Is MDL > Spike Conc.?	N	Y = failure	Al
Is Spike Conc. > 10x MDL?	N	Y = failure	
Is MDL > Spike Conc.?	N	Y = failure	Cr
Is Spike Conc. > 10x MDL?	N	Y = failure	
Is MDL > Spike Conc.?	N	Y = failure	Zn
Is Spike Conc. > 10x MDL?	N	Y = failure	

DATA VALIDATION MDL STUDY REVIEW - Tier 3 Check
OLIN November and December 2012 OU1/OU2 SW/SD
TestAmerican-Buffalo

Analyzed	Analyte	Units	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	MDL9	Average	Standard Deviation	*MDL (T*SD)	MDL reported by the lab
Cu	Cu	ug/L	0.5151	0.5197	0.5398	0.588	0.5055	0.4988	0.526			0.52756	0.029822	0.094	0.220 ug/l from 2/13/12 check

METHOD 6020 ICP-MS

* = **Values for the Student T @ 99% CONFIDENCE**

# Replicates (n)	Degrees of Freedom (n-1)	0.990 value
1	0	---
2	1	31.821
3	2	6.965
4	3	4.541
5	4	3.747
6	5	3.365
7	6	3.143
8	7	2.998
9	8	2.896
10	9	2.821
11	10	2.764
12	11	2.718

Is MDL > Spike Conc.?	N	Y = failure	Al
Is Spike Conc. > 10x MDL?	N	Y = failure	

Review/Date_____

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION

STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date Tiya Cunningham 2/28/13
Sr.

Lab Report # 480-304971-1
Project # 6107130016-10

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for **Sampling, Data Evaluation and Reporting Activities.**" MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

(J) Nitrate/Nitrite for Hold time

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Check items received. **Yes** [✓] No [ ] N/A [ ] Comments:

☑ *Name of Laboratory* ☑ *Address* ☑ *Project ID* ☑ *Phone #* ☑ *Sample identification – Field and Laboratory*

Client Information: ☑ *Name* ☑ *Address* ☑ *Client Contact* *(IDs must be cross-referenced)*

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement ***Yes*** [✓] (TC) *No* [ ] *N/A* [ ] *Comments:*

Does the laboratory report include a completed Analytical Report Certification in the required format?

***ACTION**: If no, contact lab for submission of missing certification or certification with correct format.*

1.3 Laboratory Case Narrative: ***Yes*** [✓] *No* [ ] *N/A* [ ] *Comments:*

☑ *Narrative serves as an exception report for the project and method QA/QC performance.* ☐ *Narrative includes an explanation of each discrepancy on the Certification Statement.*

***ACTION**: If no, contact lab for submission of missing or illegible information.*

1.4 Chain of Custody (COC) copy present with all documentation completed? **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (*Cooler Receipt Form*): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

Yes [✓] No [ ] N/A [ ] Comments:

☑ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☑ Container type noted ☑ Condition observed ☑ pH verified (where applicable) ☑ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used? **Yes** [✓] No [ ] N/A [ ] Comments:

✓ Ammonia,– 1 Liter polyethylene/H_2SO_4 to pH<2,cool to 4°C

Alkalinity – 1 500mL polyethylene/cool to 4°C

Chemical Oxygen Demand – 250 mL polyethylene/H_2SO_4 to pH<2,cool to 4°C

✓ Chloride, pH, sulfate - 1 500mL polyethylene/cool to 4°C Nitrate/Nitrite, sulfate, chloride

✓ Organic Carbon – 500 mL amber glass bottle/HCl or H_2SO_4 to pH<2,cool to 4°C

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C
Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C

✓ TSS, TDS - 1 500mL polyethylene/cool to 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage? **Yes** [✓] No [ ] N/A [ ] Comments:

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? Yes [ ] **No** [✓] N/A [ ] Comments:

1.6 Sample Results Section: *Was the following information supplied in the laboratory report for each sample?* **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Field ID and Lab ID ☑ Date and time collected ☑ Analyst Initials ☑ Dilution Factor ☐ % moisture or solids N/A ☑ Reporting limits
☐ *Clean-up method* N/A ☑ Analysis method ☑ Preparation method ☑ Date of preparation/extraction/digestion clean-up and analysis, where applicable
☑ Matrix ☐ Target analytes and concentrations ☑ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch? **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Method blank results ☑ LCS recoveries ☐ MS/MSD recoveries and RPDs ☐ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times Yes [✓] **No** [ ] N/A [ ] Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days Sulfide, TDS, TSS = 7 days pH = analyze immediately Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs

NOTE: List samples that exceed hold time with # of days exceeded on checklist Nitrate/Nitrite analyzed 1day Past Holdtime J Qual all samples

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method **Yes** [✓] No [ ] N/A [ ] Comments:

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

3.2 Are the practical quantitation limits the same as those specified by the ☐ SOW ☑ QAPP ☐ Lab? **Yes** [ ] No [✓] N/A [ ] Comments:

Note: *The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP*. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.*

RL = 0.05 mg/L

RL = 20 mg/L

Ammonia* ☑ = 0.1 mg/ L	Alkalinity** ☐ = 1 mg/L	Bicarbonate Alkalinity** ☐ = 1 mg/L	Carbonate Alkalinity** ☐ = 1 mg/L
Nitrate Nitrogen as N* ☑ = .05 mg/L	Nitrite Nitrogen as N* ☐ = .01 mg/L	Chloride* ☑ = 1 mg/L	Hardness * ☑ = 2.64 mg/L
Spec. Cond.** ☐ 3 umhos/cm	Total Organic Carbon** ☑ = 1 mg/L		Sulfate (EPA 300.0)* ☑ = 2 mg/L
COD:* Low – 20 mg/L	pH* ☐ < 2 to > 12	TDS* ☐ = 10 mg/L	TSS* ☑ = 5 mg/L

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If *dilutions were required, were dilution factors reported?* **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact the lab for submission.

4.0 **<u>Method Blanks</u>** **Yes** [✓] No [ ] N/A [ ] Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs). **Yes** [✓] No [ ] N/A [ ] Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following: Yes [ ] **No** [✓] N/A [ ] Comments:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 5 × blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits? Yes [ ] **No** [✓] N/A [ ] Comments:

LCS Limits:

Alkalinity** ☐ = 80-120% Bicarbonate Alkalinity** ☐ = 80-120% Carbonate Alkalinity** ☐ = 80-120% Specific Conductivity *☐ = 80-120%

Total Organic Carbon** ☑ = 80-120% TDS** ☐ = 80-120% Ammonia Nitrogen as N* ☑ = 80-120%

COD Low* ☐ = 80-120% Nitrate Nitrogen as N**☑ = 80-120%% Nitrite Nitrogen as N** ☑ = 80-120%

Hardness* ☑ = 80-120% Chloride* ☑ = 80-120% Sulfate (EPA 300.0)* ☑ = 80-120% pH* ☐ = 80-120% TSS* NA

Other parameter(list) Bromide %R = 98 : 95% ☑ Rec Limits= 80-120 %

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked. **Yes** [ ] No [✓] N/A [ ] Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the MS/MSD Recovery Form present? **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: If no, contact lab for resubmission of missing data.

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix? **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: If any matrix spike data is missing, call lab for resubmission.

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$ Where: SSR = Spiked sample result; SR = Sample result; SA = Spike added

MS/MSD Recovery Limits:

Alkalinity* = NA Bicarbonate Alkalinity* = NA Carbonate alkalinity* = NA Ammonia* (LACHAT) ☐ = 74-125%

Chloride** ☐= 75-125% Specific Conductivity * = NA Total Organic Carbon* = NA TDS** = NA

COD Low* ☐ = 75-125% Nitrate Nitrogen as N** ☐ = 75-125%

Nitrite Nitrogen as N** ☐ = 75-125% Hardness* ☐ = 75-125% Sulfate (EPA 300.0)* ☐ = 75-125% pH* = NA TSS* = NA

Other parameter(list) _____ % R = _____ ☐ Rec Limits = _____

* = Laboratory Limits ** = Olin QAPP Limits *(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)*

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits? Yes [ ] **No** [✓] (TC) N/A [✓] Comments:

NOTE: $RPD = \frac{S - D}{(S + D)/2} \times 100\%$ Where S = MS result, D = MSD result

MS/MSD RPD Limits:

Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia** (LACHAT) ☐ = 20%
Chloride**(SM 4500 Cl) ☐ = 20%	Specific Conductivity * = NA	Total Organic Carbon* = NA	TDS** = NA Total Organic Carbon* = NA
COD Low** ☐ = 20%	COD High** ☐ = 20%	Nitrate Nitrogen as N** ☐ 20%	Nitrite Nitrogen as N** ☐ = 20%
Hardness* = NA	Sulfate (EPA 300.0)* ☐ = 20%	pH* = NA	TSS* = NA

Other parameter(list) _____ RPD = _____ ☐ RPD limit = _____

Other parameter(list) _____ RPD = _____ ☐ RPD limit = _____

* = Laboratory Limits ** = Olin QAPP Limits

(*MADEP has not yet defined LCS recovery limits for wet chemistry analyses.*)

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20%? Not Analyzed **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist. **Yes** [ ] No [✓] N/A [ ] Comments:

8.2 Do any rinsate blanks have positive results? Yes [ ] **No** [ ] N/A [✓] Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

NOTE: *MADEP does not require the collection of rinsate blanks.*

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates. **Yes** [ ] No [✓] N/A [ ] Comments:

9.2 Were field duplicates collected per the required frequency? **Yes** [ ] No [ ] N/A [✓] Comments:

SOW ☐ QAPP ☐ *MADEP Option 1(1 per 20)* ☐ *MADEP Option 3 (1 per 10)* ☐

9.3 Was the RPD ≤ 50% for soils or ≤30% for waters? Calculate the RPD for all results and attach to this review. **Yes** [ ] No [ ] N/A [✓] Comments:

ACTION: RPD must be ≤50% for soil or ≤30% water. Qualify data (J) for both sample results if the RPD exceeds limit.

Was any of the data qualified? Yes [✓] **No** [ ] N/A [ ] Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

Hold time for Nitrate / Nitrite

REFERENCES

MACTEC, Quality Assurance Project Plan for Remedial Investigation/Feasibility Study – Olin Chemical Superfund Site, Wilmington Property, 51 Eames Street, Wilmington, MA", MACTEC Engineering and Consulting. Draft .October 2008.

STL-Westfield, 2002. "Olin – General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: OC-SW-SD-501-XXX

Lab Sample ID: 480-30497-1

Lab Name: TestAmerica Buffalo

Job No.: 480-30497-1

SDG ID.:

Matrix: Water

Date Sampled: 12/17/2012 12:15

Reporting Basis: WET

Date Received: 12/17/2012 18:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7664-41-7	Ammonia	28	0.40	0.18	mg/L			20	350.1
14797-65-0	Nitrite as N	0.075	0.050	0.020	mg/L		~~H~~ J	1	353.2
	Hardness as calcium carbonate	460	20	5.3	mg/L			1	SM 2340C
24959-67-9	Bromide	0.13	0.20	0.073	mg/L	J		1	300.0
16887-00-6	Chloride	52	0.50	0.28	mg/L			1	300.0
14808-79-8	Sulfate	460	20	3.5	mg/L			10	300.0
14797-55-8	Nitrate as N	3.6	0.050	0.011	mg/L	J	~~H~~	1	353.2
7440-44-0	Total Organic Carbon	11	1.0	0.43	mg/L			1	SM 5310D
7440-44-0	Total Organic Carbon - Duplicates	11	1.0	0.43	mg/L			1	SM 5310D
	TOC Result 1	10	1.0	0.43	mg/L			1	SM 5310D
	TOC Result 2	11	1.0	0.43	mg/L			1	SM 5310D

TC
2/28/13

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: OC-SW-SD-503-XXX

Lab Sample ID: 480-30497-2

Lab Name: TestAmerica Buffalo

Job No.: 480-30497-1

SDG ID.:

Matrix: Water

Date Sampled: 12/17/2012 14:30

Reporting Basis: WET

Date Received: 12/17/2012 18:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7664-41-7	Ammonia	7.5	0.20	0.090	mg/L			10	350.1
14797-65-0	Nitrite as N	0.026	0.050	0.020	mg/L	J	~~H~~	1	353.2
	Hardness as calcium carbonate	120	20	5.3	mg/L			1	SM 2340C
24959-67-9	Bromide	ND	0.20	0.073	mg/L			1	300.0
16887-00-6	Chloride	9.0	0.50	0.28	mg/L			1	300.0
14808-79-8	Sulfate	96	2.0	0.35	mg/L			1	300.0
14797-55-8	Nitrate as N	0.084	0.050	0.011	mg/L	J	~~H~~	1	353.2
7440-44-0	Total Organic Carbon	11	1.0	0.43	mg/L			1	SM 5310D
7440-44-0	Total Organic Carbon - Duplicates	11	1.0	0.43	mg/L			1	SM 5310D
	TOC Result 1	11	1.0	0.43	mg/L			1	SM 5310D
	TOC Result 2	11	1.0	0.43	mg/L			1	SM 5310D

TC
2/28/13

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: OC-SW-SD-1-XXX

Lab Sample ID: 480-30497-3

Lab Name: TestAmerica Buffalo

Job No.: 480-30497-1

SDG ID.:

Matrix: Water

Date Sampled: 12/17/2012 15:30

Reporting Basis: WET

Date Received: 12/17/2012 18:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7664-41-7	Ammonia	21	0.40	0.18	mg/L			20	350.1
14797-65-0	Nitrite as N	0.043	0.050	0.020	mg/L	J	~~H~~	1	353.2
	Hardness as calcium carbonate	80	20	5.3	mg/L			1	SM 2340C
24959-67-9	Bromide	ND	0.20	0.073	mg/L			1	300.0
16887-00-6	Chloride	64	0.50	0.28	mg/L			1	300.0
14808-79-8	Sulfate	110	4.0	0.70	mg/L			2	300.0
14797-55-8	Nitrate as N	0.96	0.050	0.011	mg/L	J	~~H~~	1	353.2
7440-44-0	Total Organic Carbon	4.5	1.0	0.43	mg/L			1	SM 5310D
7440-44-0	Total Organic Carbon - Duplicates	4.5	1.0	0.43	mg/L			1	SM 5310D
	TOC Result 1	4.3	1.0	0.43	mg/L			1	SM 5310D
	TOC Result 2	4.7	1.0	0.43	mg/L			1	SM 5310D

TC
2/28/13

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: OC-SW-PZ-17RR-XXX

Lab Sample ID: 480-30497-4

Lab Name: TestAmerica Buffalo

Job No.: 480-30497-1

SDG ID.:

Matrix: Water

Date Sampled: 12/17/2012 15:45

Reporting Basis: WET

Date Received: 12/17/2012 18:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7664-41-7	Ammonia	33	0.40	0.18	mg/L			20	350.1
14797-65-0	Nitrite as N	0.022	0.050	0.020	mg/L	J	~~H~~	1	353.2
	Hardness as calcium carbonate	80	20	5.3	mg/L			1	SM 2340C
24959-67-9	Bromide	ND	0.20	0.073	mg/L			1	300.0
16887-00-6	Chloride	96	2.5	1.4	mg/L			5	300.0
14808-79-8	Sulfate	150	10	1.7	mg/L			5	300.0
14797-55-8	Nitrate as N	0.62	0.050	0.011	mg/L	J	~~H~~	1	353.2
7440-44-0	Total Organic Carbon	7.6	1.0	0.43	mg/L			1	SM 5310D
7440-44-0	Total Organic Carbon - Duplicates	7.6	1.0	0.43	mg/L			1	SM 5310D
	TOC Result 1	7.6	1.0	0.43	mg/L			1	SM 5310D
	TOC Result 2	7.6	1.0	0.43	mg/L			1	SM 5310D

TC
2/28/13

December SW

CHEMIST REVIEW-VALIDATION CHECKLIST

~~pH by 9045C ORP by SM 2580B~~ TC

Project: Olin Chemical Superfund Site
Project #: 6107130016-10
Date: 3-1-13

Method: Hexavalent Chromium by ~~7199~~ 7196 TC
Laboratory and SDG: ~~TAL-Buffalo/Edison NJ~~ TAL-Westfield
Reviewer: Tiye Cunningham

Analyzed @ TAL-Westfield

SDG# 480-30497-1

☑ Chemist Review Full Validation (add page 2)
QC Limits listed below presented in the Olin Chemical Superfund Site QAPP [MACTEC, 2009].

1. Case Narrative and Data Package Completeness (COC Review)
~~Human Health PAL = 30mg/kg Eco PAL = 12.01mg/kg~~

2. Holding Time and Sample Preservation ~~(30 days to digest, 7 days to analyze digestate)~~ 24 hrs

Samples analyzed w/in 24hrs

3. QC Blanks

MB clean ✓

4. Laboratory Control Sample Review (% recovery 80-120, RPD 20)

LCS/LCSD w/in Limits

5. Field Duplicate Precision (RPD 50)

Not Collected

6. Lab Duplicate Precision (RPD 35)

Not analyzed

7. Matrix Spike Results (if applicable) (% recovery 75-125, RPD 35)

Sample OC-SW-SD-1 used MS=96% MSD=91%

8. Surrogate Recovery (if applicable)

Not applicable.

9. Internal Standard Recovery (if applicable)

Not applicable.

CHEMIST REVIEW-VALIDATION CHECKLIST

FULL VALIDATION CHECKS

Ten Percent of data sets will have full validation checks completed during chemist review.

☑ **Initial Calibration**

See attached excel for all calculation checks w/ * below

☑ **Continuing Calibration Verification**

ICV *

Transcription and Calculation Checks

☑ **Instrument Calibration**

*

☑ **Blank Review – raw data/chromatogram check**

OK

☑ **Laboratory Control Sample**

*

☑ **Matrix Spike**

N/A

☑ **Field Sample Results**

*

☐ **Surrogate Recovery**
Not applicable.

Calibration

Calib 97411-0 / Cr (VI)

Curve Type:	Linear
Weighting:	None
Origin:	None
Dependency:	Concentration
Calib Mode:	ESTD
RF Rounding:	0

Curve Coefficients

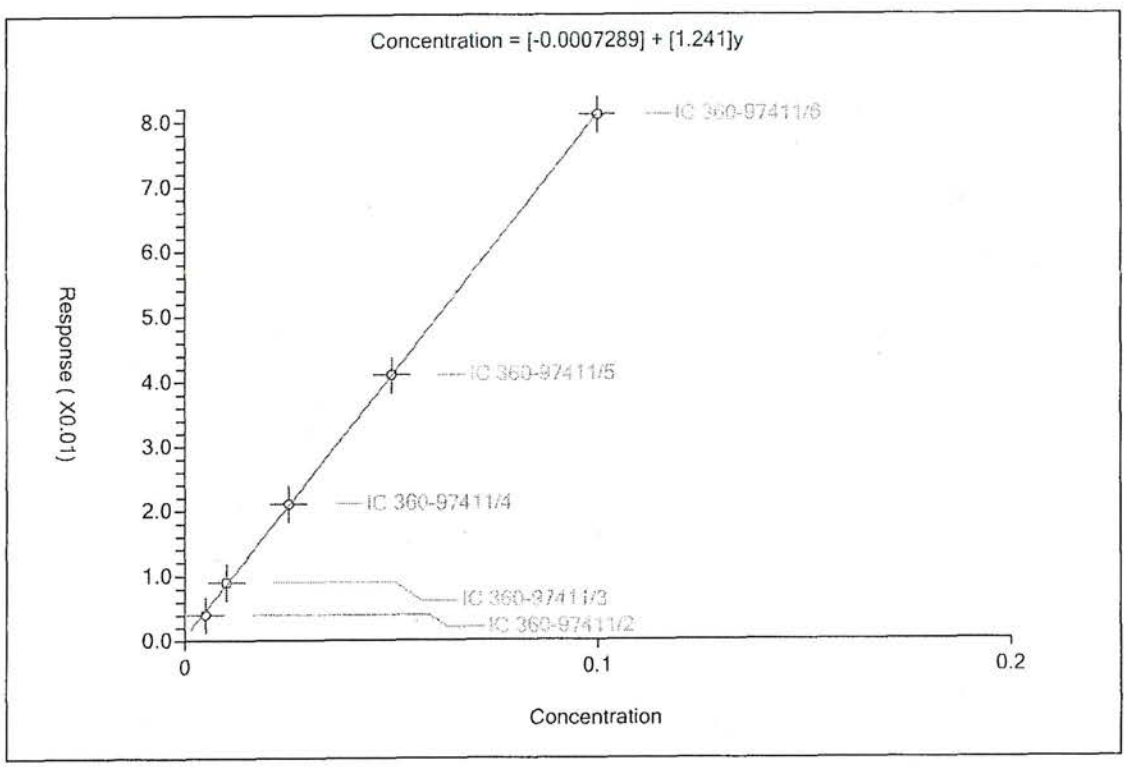
Intercept:	-0.0007289
Slope:	1.241

Error Coefficients

Standard Error:	0.000564
Relative Standard Error:	9.22
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	1.000 (1.000)

ID	Level	Concentration	Response	IS Amount	IS Response	RF	Used
1	IC 360-97411/2	0.005	0.004			0.8	Y
2	IC 360-97411/3	0.01	0.009			0.9	Y
3	IC 360-97411/4	0.025	0.021			0.84	Y
4	IC 360-97411/5	0.05	0.041			0.82	Y
5	IC 360-97411/6	0.1	0.081			0.81	Y

✓ see attached excel



3/1/13
TC

TALS Raw Data Report

Job Number: 360-30497-1
LIMS Batch: 97411
Equipment: Jenway UV/VIS

Laboratory: TestAmerica Westfield

RS# 7 Lab ID: **ICV 360-97411/7** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.041	0.050152 mg/L	mg/L	100	90	110		

RS# 8 Lab ID: **ICB 360-97411/8** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.001	0.000512 mg/L	mg/L					

RS# 9 Lab ID: **MB 360-97411/9** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0	-0.000728 mg/L	mg/L					

RS# 10 Lab ID: **LCS 360-97411/10** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.041	0.050152 mg/L	mg/L	100	80	120		

RS# 11 Lab ID: **LCSD 360-97411/11** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.041	0.050152 mg/L	mg/L	100	80	120	0	20

RS# 12 Lab ID: **480-30497-N-3** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.002	0.001753 mg/L	mg/L					

RS# 13 Lab ID: **480-30497-N-3 MS** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.020	0.0240911 mg/L	mg/L	96	85	115		

RS# 14 Lab ID: **480-30497-N-3 MSD** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.019	0.022850 mg/L	mg/L	91	85	115	5	20

RS# 15 Lab ID: **480-30497-N-2** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.009	0.010440 mg/L	mg/L					

✓ see excel sheet

RS# 16 Lab ID: **480-30497-N-1** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.002	0.001753 mg/L	mg/L					

RS# 17 Lab ID: **480-30497-N-4** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.001	0.000512 mg/L	mg/L					

RS# 18 Lab ID: **CCV 360-97411/18** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt
Cr (VI)	0.042	0.051393 mg/L	mg/L	103	90	110		

RS# 19 Lab ID: **CCB 360-97411/19** Inj Date: 12/18/2012 11:13:28AM Dil: 1.0 Meth: 7196A

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt		% RPD	RPD Lmt

TC
3/4/13

SDG 480-30497-1	Cr+6 Line from 12/18/2012		
Std Level	**Cr+6 Std Conc (ppb)**	**Area Response Cr+6**	
1	5	0.0040	
2	10	0.0090	
5	100	0.0810	
3	25	0.0210	
4	50	0.0410	
	y	x	
	Cr+6		
slope	1241.31057	-0.728889798	**intercept**
+-	9.017725805	0.377884677	**+-**
r2	0.999841698	0.564080194	**s(y)**
F	18948.15181	3	**degrees of freedom**
regression ss	6029.045441	0.954559395	**residual ss**
ICV 360-97411/7			
Cr+6			
Response	0.041		
Amount Found (ug/l)	50.165		
Amount reported in raw data	50.152		
%D	0.03%		
LCS from 12/18/12 11:13			
Cr+6			
Response	0.041		
Amount Found (ug/l)	50.165		
Amount Nominal (ug/l)	50		
Percent Recovery (%)	100.33		
SAMPLE CALCULATION CHECK = OC-SW-SD-503-XXX			
Cr+6	on 1/1/13 21:03		
Response	0.009		
Amount Found (ug/l)	10.443		