DATA VALIDATION REPORT
2012 REMEDIAL INVESTIGATION/FEASIBILITY STUDY

OPERABLE UNITS 1 AND 2
DECEMBER 2012
SUPPLEMENTAL SOIL INVESTIGATION

OLIN CHEMICAL SUPERFUND SITE
51 EAMES STREET
WILMINGTON, MASSACHUSETTS

Prepared for:

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April 04, 2013

AMEC Project No. 6107130016.01.10

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ACRONYMS AND ABBREVIATION

APHA	American Public Health Association
CCV%D	Continuing Calibration Verification Percent Difference
EDD	Electronic Data Deliverable
J	estimated value
-L	low bias
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
mg/L	milligrams per liter
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MS/MSD	Matrix Spikes/Matrix Spike Duplicate
QAPP	Quality Assurance Project Plan
QC	Quality Control
RI/FS	Remedial Investigation/Feasibility Study
RPD	Relative Percent Difference
RRF	Relative Response Factor
SDG	Sample Delivery Group
SVOC	Semivolatile Organic Compound
TIC	Tentatively identified compounds
TMP	trimethyl pentenes
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Surface and subsurface soil samples were collected at the Olin Chemical Superfund Site in December 2012 as specified in the Supplemental Work Plan – Operable Unit 1, Olin Chemical Superfund Site, Wilmington, MA (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	VOCs (trimethyl pentenes [TMPs])	SW-846 8260C	Tier II/III
TestAmerica - Buffalo, NY	SVOCs	SW-846 8270D – Low Level	Tier II/III
TestAmerica - Buffalo, NY	EPH	MADEP EPH-98-1	Olin Level 1
TestAmerica – Burlington, VT	Tributyltin	Lab Method: GC/FPD	Chemist Review
TestAmerica - Buffalo, NY	Metals (tin)	SW-846 6010B	Tier II/III
TestAmerica - Edison, NJ and Irvine, CA	Hexavalent Chromium (Cr+6)	SW-846 7199	Chemist Review
TestAmerica - Buffalo, NY	Percent solids/percent moisture	EPA 160.3	Chemist Review
TestAmerica - Buffalo, NY	pH/ORP	SW9045C / ASTM 2580B	Chemist Review

A summary of samples (by sample delivery group [SDG]) included in this data validation report is presented in Table 1. With the exception of tributyltin, 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). Tributyltin was added to the program in an addendum to the RI/FS Work Plan in December 2012 and was not part of the QAPP. A chemist review was performed on the tributyltin data and is discussed in Section 5 of this report. 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) (Massachusetts Department of Environmental Protection [MassDEP], 2004). 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 reviewed (Tier II/III, Olin Level 1, chemist review) are summarized above.

Final validated sample results are presented in a series of tables (Table 2s) associated with Sections 2 through 8 of this document. Tables 2.2 through 2.8 present the final data for the various analytical methods that are addressed in Sections 2 through 8 (i.e., VOCs presented in Table 2.2, SVOCs presented in Table 2.3).

Documentation of data validation actions is presented in a series of tables (Table 3s) associated with Sections 2 through 8 of this document. Tables 3.2 through 3.8 present final results that have been qualified (data validation has resulted in revisions to the laboratory result) for the various analytical methods that are addressed in Sections 2 through 8 as well as the associated validation reason codes. An index of the reason codes is presented on the last page of Table 3. There are no tables 3.4 and 3.8 because no validation actions were taken for the associated methods.

Tentatively identified compounds (TICs) were reported by the laboratory for VOC and SVOC analyses. Samples collected in this investigation were analyzed for SVOCs and TMPs (VOCs). TICs in VOC samples were not evaluated during validation of the data and are not addresses in this validation report. TICs reported in SVOC samples were evaluated during validation and were removed from the data set if reported in associated method blanks or if they are identified as common lab contaminants in validation guidelines. SVOC TICs, discussed in Section 3, are summarized by SDG in Table 4.1.

2.0 VOLATILE ORGANIC COMPOUNDS (VOCS)

Samples were analyzed for 2,4,4-trimethyl-1-pentene and 2,4,4-trimethyl-2-pentene by method SW-846 8260C.

Data were reviewed for the following parameters:

* Data Completeness
* Holding Times and Preservation
* Blanks
* Surrogate Recovery
  Initial and Continuing Calibration Standards
  Laboratory Control Sample (LCS)
* Instrument Tunes
* Internal Standards
* Matrix Spike/Matrix Spike Duplicate (MS/MSD)
* Field Duplicates
  Detection Limits
* Sample Result Verification / Electronic Data Deliverable (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 2.2. A summary of data validation actions is presented on Table 3.2.

2.1 Initial and Continuing Calibration Standards

A subset of sample results was qualified due to continuing calibration percent differences that were outside project Quality Control (QC) goals. Qualified results are summarized on Table 3.2 with reason code Continuing Calibration Verification Percent Difference (CCV%D).

SDG 480-29976-1

The percent differences between the relative response factor (RRF) in the continuing calibration standard and the average RRF in the initial calibration were calculated and reported by the laboratory. The percent difference was above the USEPA Region I data validation guideline limit of 25 for 2,4,4-trimethyl-1-pentene (32) in the continuing calibration analyzed on December 13, 2012 at 22:42. Results for 2,4,4-trimethyl-1-pentene were qualified estimated (J/UJ) in associated samples.

SDG 480-30197-1

The percent difference was above the USEPA Region I data validation guideline limit of 25 for 2,4,4-trimethyl-1-pentene (32) in the continuing calibration analyzed on December 16, 2012 at 11:36. Results for 2,4,4-trimethyl-1-pentene were qualified estimated (UJ) in associated samples.

2.2 Laboratory Control Sample

Laboratory control samples (LCS/LCSD) were evaluated based on percent recovery control limits of 70-130. Qualified results are summarized on Table 3.2 with a reason code of LCS-H.

SDG 480-29976-1

The percent recovery of 2,4,4-trimethyl-2-pentene (138) in the LCS analyzed on December 17, 2012 at 13:15 was above the upper QC limit. The result of 2,4,4-trimethyl-2-pentene in the associated soil sample (OC-SB-486-8.0/10-XXX) was qualified estimated (J).

2.3 Detection Limits

SDG 480-30106-1

Prior to analysis, the laboratory inadvertently disposed of the low level vials preserved with de-ionized water containing the soil samples in SDG 480-301106-1. Vials containing soil preserved with methanol were used for analysis. Reporting limits for compounds not detected in these soil samples ranged from 240 micrograms per kilogram (µg/kg) to 340 µg/kg.

3.0 SEMIVOLATILE ORGANIC COMPOUNDS

Samples were analyzed for SVOCs by method SW-846 8270D (low level method). Data validation actions for these methods are reported in this section.

Data were reviewed for the following parameters:

* Data Completeness
* Holding Times and Preservation
* Blanks
* Instrument Tunes
  Initial and Continuing Calibration Standards
  LCS
  MS/MSD
* Field Duplicates
* Surrogate Recovery
  Internal Standards
  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 2.3. A summary of data validation actions is presented on Table 3.3.

3.1 Initial and Continuing Calibration Standards

SDG 480-30106-1

The percent difference of benzoic acid (27) was above the control limit in the continuing calibration standard analyzed on December 19, 2012 at 11:16. Benzoic acid was not detected in associated samples and the reporting limits were qualified as estimated (UJ).

3.2 LCS

A subset of sample results was qualified due to LCS and/or LCSD percent recoveries and/or relative percent differences (RPDs) that were outside project QC goals. Qualified results are summarized on Table 3.3 with a reason code of LCS-L. LCS spikes were reported for all associated samples in the data set. When the samples were submitted to the laboratory only BEHP analysis was requested; therefore, the laboratory did not spike the LCS samples with the full list of compounds included in the Olin 8270 list. Subsequently a request was made to the lab to report the full Olin 8270 list for field samples. A subset of LCS spikes associated with the field samples were reported with a partial list of compounds. Accuracy reviews for compounds that were not reported in the LCS spikes are based only on calibration reviews.

SDG 480-29598-1

The following compounds had percent recoveries that were outside the control limits in the LCS/LCSD: benzyl alcohol (0, 0), 4-nitrophenol (0, 0), and benzoic acid (1, 3). These analytes were not detected in associated soil samples and the final results were qualified (R) rejected in the final data set.

SDG 480-30106-1

The following compounds had percent recoveries that were outside the control limits in the LCS/LCSD analyzed on December 19, 2012: benzyl alcohol (3, 0), 4-nitrophenol (0, 0), 2,4-dinitrophenol (11, 0), 4-chloroaniline (37), and 2,6-dinitrotoluene (31, 37). Benzyl alcohol, 4-nitrophenol, and 2,4-dinitrophenol were not detected in associated soil samples and the final results were qualified (R) rejected in the final data set. 4-Chloroaniline and 2,6-dinitrotoluene were not detected in associated soil samples and the reporting limits were qualified estimated (UJ) in the final data set. RPDs between recoveries were outside the control limit for the following compounds: 2,4-dimethylphenol (45), 4-methylphenol (40), 2-nitrophenol (35), 2,4-dinitrophenol (200), n-nitrosodimethylamine (35), benzyl alcohol (200), and 4-chloroaniline (33). These compounds were not detected and reporting limits were qualified estimated (UJ) or rejected due to low percent recoveries (as listed above).

4-Nitrophenol was recovered at 14 percent in the LCS analyzed on December 20, 2012 and was not detected in associated soil samples. The reporting limits were qualified estimated (UJ) in the final data set. RPDs between recoveries were outside the control limit for the following compounds: 2,4-dinitrophenol (74) and 4-nitrophenol (147). These compounds were not detected and reporting limits were qualified estimated (UJ).

SDG 480-30197-1

A subset of target compound results was qualified due to LCS/LCSD associated with all samples in SDG 480-30197-1. Percent recoveries were less than the QC limit of 30 for 2,4-dinitrophenol (11, 0), 4-nitrophenol (0, 0), and benzyl alcohol (3, 0), which may indicate gross low bias. Percent recoveries were less than the QC limit of 40 for 4-chloroaniline (37), 2,6-dinitrotoluene (31, 33), and n-nitrosodiphenylamine (37, 39), which may indicate low bias. RPDs were outside the laboratory QC limit of 30 for 2,4-dimethylphenol (45), 2-nitrophenol (35), 2,4-dinitrophenol (200), 4-chloroaniline (33), 4-methylphenol (40), n-nitrosodimethylamine (35), and benzyl alcohol (200). 2,4-Dinitrophenol, 4-nitrophenol, and benzyl alcohol were not detected in any of the associated samples and were qualified as rejected (R). Results for 2,4-dimethylphenol, 2-nitrophenol, 4-chloroaniline, 2,6-dinitrotoluene, 4-methylphenol, n-nitrosodiphenylamine, and n-nitrosodimethylamine were qualified estimated (J/UJ).

SDG 480-30346-1

The LCS/LCSD associated with all samples in SDG 480-30346-1 had a percent recovery less than the QC limit of 30 for 4-Nitrophenol (14), which may indicate low bias, and RPDs outside the laboratory QC limit of 30 for 2,4-dinitrophenol (74) and 4-nitrophenol (147). 2,4-Dinitrophenol and 4-nitrophenol were not detected in any of the associated samples and reporting limits were qualified estimated (UJ).

3.3 MS/MSD

SDG 480-30106-1

A MS/MSD analysis was completed on sample OC-SB-514-15/17-XXX. The following compounds had percent recoveries below the control limit: n-nitrosodiphenylamine (38, 36) and 4-chloro-3-methylphenol (16). These compounds were not detected in the un-spiked sample and the reporting limits were qualified estimated (UJ) in the final data set.

3.4 Internal standards

SDG 480-29598-1

The internal standard response for perylene-d12 was outside of acceptance limits for sample OC-SB-528-0.0/1.0-XXX. The laboratory stated in the narrative that sample OC-SB-528-0.0/1.0-XXX contained a non-target analyte at the same retention time, and contained the same ion mass as the quantitation ion for perylene-d12. Compounds associated with perylene-d12 were not detected (benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene) and would be qualified estimated (UJ). However, final results were subsequently rejected due to a percent solid value below the Region I guideline (see Section 3.5).

SDG 480-30346-1

The internal standard response was less than the lower acceptable limits for phenanthrene-d10 in sample OC-SB-519-8.0/10-XXX and the internal standard responses were less than the lower acceptable limit for perylene-d12 in samples OC-SB-519-8.0/10-XXX, OC-SB-519-12/14-XXX, and OC-SB-518-8.0/10-XXX. Phenanthrene-d10 associated compound n-nitrosodiphenylamine was detected in sample OC-SB-519-8.0/10-XXX and was qualified as estimated (J). Phenanthrene-d10 associated compounds azobenzene, 4-bromophenyl phenyl ether, hexachlorobenzene, pentachlorophenol, phenanthrene, anthracene, carbazole, di-n-butyl phthalate, and fluoranthene were not detected in sample OC-SB-519-8.0/10-XXX and reporting limits were qualified as estimated (UJ). Perylene-d12 associated compounds benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene were not detected in samples OC-SB-519-8.0/10-XXX, OC-SB-519-12/14-XXX, and OC-SB-518-8.0/10-XXX and reporting limits were qualified as estimated (UJ).

3.5 Detection limits

SDG 480-29598-1

The percent solid of sample OC-SB-528-0.0/1.0-XXX (27) was below the Region I validation guideline goal of 30. Detections were qualified estimated (J) and compounds that were not detected were qualified (R) rejected in the final data set.

Soil samples OC-SB-528-0.0/1.0-XXX and OC-SB-528-1.0/3.0-XXX were analyzed at a 20X dilution due to elevated target compounds. The reporting limits of analytes that were not detected have been elevated by a 20X factor in the final data set.

SDG 480-30197-1

A dilution was required for sample OC-SB-522-8.0/10-XXX (100) due to target compound concentrations. Reporting limits for compounds that were not detected are elevated.

SDG 480-30197-1

Detections for target compounds phenanthrene and fluoranthene exceeded the upper limit of the calibration range and were qualified as estimated (J).

SDG 480-30346-1

Dilutions were required for sample OC-SB-518-0.0/1.0-XXX (500) and OC-SB-518-13/15-XXX (20) due to target compound concentrations. Reporting limits for compounds that were not detected are elevated.

4.0 EXTRACTABLE PETROLEUM HYDROCARBONS

Samples were analyzed for extractable petroleum hydrocarbons (EPH) by MassDEP Method EPH-98-1. Data were reviewed for the following parameters:

* Data Completeness
* Holding Times and Preservation
* Blanks
* Surrogate Recovery
* LCS
* MS/MSD
* Field Duplicates
* 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. A summary of final results is presented on Table 2.4.

4.1 Sample Result Reporting

SDG 480-30197

The laboratory performed an EPH confirmation analysis of sample OC-SB-533-6.0/8.0-XXX using SW-846 Method 8270C. The individual poly aromatic hydrocarbon (PAH) compounds in sample OC-SB-533-6.0/8.0-XXX are reported by method SW-846 8270C in the final data set. The individual PAH compounds were not detected at a reporting limit of 990 µg/kg.

5.0 TRIBUTYLTIN

Three soil samples were analyzed for tributyltin by TestAmerica using the following lab specific method: Organotins by Gas Chromatography with flame photometric detector (GC/FPD). A chemist review was performed on the data sets. Transcription and calculation checks were performed on the initial and continuing calibration standards, LCS, and MS. Data were reviewed for the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Initial and Continuing Calibration Standards
* LCS
* MS/MSD
* Laboratory Duplicate Analysis
* Field Duplicates
* Surrogate Recovery
* Internal Standard (tetra-n-propyltin)
  Detection Limits and Percent Solid
* 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 2.5. A summary of data validation actions is presented on Table 3.5.

5.1 Percent Solids

SDG 480-29598-1

The percent solid of sample OC-SB-528-0.0/1.0-XXX (27) was below the Region I validation guideline goal of 30. Tributyltin was not detected in the sample and the final result was qualified (R) rejected.

6.0 METALS (TIN ONLY)

Samples were analyzed for tin by Method SW-846 6010C. Data were reviewed for the following parameters:

* Data Completeness
* Sample Preservation and Holding Times
* Blanks
  Initial and Continuing Calibration Standards
* LCS
* Matrix Spike Analysis
* Field Duplicates
* Interference Check Sample
* Serial Dilution Analysis
  Detection Limits and Percent Solid
* 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 2.6. A summary of data validation actions is presented on Table 3.6.

6.1 Calibration Standards

The two quantitation limit (QL) standards analyzed for tin at 0.01 milligrams per liter (mg/L) were recovered at 59 and 58 percent, below the 70 percent control limit. Low level detections for tin (within two times the QL standard) were reported and final results were qualified estimated (J) in the following samples: OC-SB-528-0.0/1.0-XXX, OC-SB-528-1.0/3.0-XXX and OC-DUP-2.

6.2 Percent Solids

SDG 480-29598-1

The percent solid of sample OC-SB-528-0.0/1.0-XXX (27) was below the Region I validation guideline goal of 30. The reported detection of tin at 7.5 milligrams per kilogram (mg/kg) was qualified estimated (J) in the final data set.

7.0 HEXAVALENT CHROMIUM

Samples were analyzed for hexavalent chromium (chromium+6) by method SW-846 7199. A chemist review was performed on the data sets. Data were reviewed for the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Initial and Continuing Calibration Standards
  LCS
  MS/MSD
* Laboratory Duplicate Analysis
* Field Duplicates
  Detection Limits and Percent Solid
* 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 2.7. A summary of data validation actions is presented on Table 3.7.

7.1 Laboratory Control Sample

Laboratory control samples were evaluated based on percent recovery control limits of 80-120. Qualified results are summarized on Table 3.7 with a reason code of LCS-L.

SDG 480-29976-1

Hexavalent chromium was recovered at 79 percent in the laboratory control sample analyzed with soil samples in SDG 480-29976-1 and final results were qualified estimated (J/UJ).

SDG 480-30197-1

Hexavalent chromium was recovered at 75 percent in the laboratory control sample analyzed with soil samples in SDG 480-30197-1 and final results were qualified estimated (J/UJ).

SDG 480-30346-1

Hexavalent chromium was recovered at 75 percent in the laboratory control sample analyzed with soil samples in SDG 480-30346-1 and final results were qualified estimated (J/UJ).

7.2 Matrix Spike Analysis

Percent recoveries reported by the laboratory on soil samples were evaluated based on the QA/QC limits presented in the QAPP of 75-125 with a RPD of 35. In general, the percent recoveries of hexavalent chromium were below the control limit of 75 on samples that were spiked that exhibited reducing conditions (pH values, ranging from 3.8 to 6.1). Professional judgment was used and samples were not qualified due to the low spike recoveries observed in these samples. Specific actions are discussed below.

SDG 480-29484-1

Sample OC-SS-521-0.0/1.0-XXX was submitted for MS/MSD analysis. The laboratory performed soluble and insoluble hexavalent chromium matrix spikes on the soil sample. Percent recoveries ranged from 13 to 23. Percent recoveries of the post-digestion spikes analyzed on the sample were 106 and 101 and within control limits. The oxidation reduction potential (67mV) and pH (3.8) of the sample were measured by the laboratory within twenty-four hours after sample collection which demonstrated a reducing condition in the soil matrix. Based on the reducing condition present in the soil matrix of the sample spiked, associated samples were not qualified due to the low percent recoveries.

SDG 480-29895-1

TestAmerica Irvine, CA (TAL-Irvine) and TestAmerica Edison, NJ (TAL-NJ) performed the hexavalent chromium analysis on the samples in SDG 480-29895-1. Sample OC-SB-506-6.0/8.0-XXX was submitted for MS/MSD analysis and analyzed by both labs. Percent recoveries reported by TAL-Irvine were 68 and 67 and were below QA/QC control limits present in the QAPP, but were within laboratory limits (55-110) and were not re-analyzed by the laboratory. Percent recoveries reported by TAL-NJ were 86 and 92 and within control limits. Reducing conditions (pH of 6.07, ORP of 18) were present in the samples when the samples were spiked which potentially reduced the hexavalent chromium prior to analysis. Based on professional judgment samples results were not qualified due to low recoveries.

SDG 480-29976-1

Sample OC-SS-504-7.5/9.5-XXX was submitted for MS/MSD analysis. The percent recovery of the soluble MS was 76 and was within the QA/QC control limits. Hexavalent chromium was recovered below the QA/QC control limit in the soluble MSD (74) and insoluble MS (71). The sample had a pH of 7.11 and an ORP of 26 mV. Percent recoveries were within laboratory control limits (55-110) and were not re-analyzed. Hexavalent chromium results for soil samples reported in SDG 480-29976-1 were qualified estimated (J/UJ).

SDG 480-30106-1

Samples OC-SB-513-0.0/1.0-XXX and OC-SB-514-5/17-XXX were spiked for MS/MSD analysis. Hexavalent chromium was recovered below the QA/QC limits in the both samples:

	Soluble spike recovery		Insoluble spike	
Sample ID	**MS**	**MSD**	**MS**	**pH / ORP**
OC-SB-513-0.0/1.0-XXX	56	55	56	7.3 / 45 mV
OC-SB-514-15/17-XXX	69	71	74	6.85 / 14 mV

Hexavalent chromium was detected at 0.88 mg/kg in sample OC-SB-514-5/17-XXX. Results for hexavalent chromium were qualified estimated (J/UJ) in all soil samples reported in SDG 480-30106-1.

SDG 480-30346-1

Sample OC-SB-521-0.0/1.0-XXX was submitted for MS/MSD analysis. Percent recoveries ranged from 0 to 6 in the soluble and insoluble matrix spikes. The oxidation reduction potential (84 mV) and pH (3.8) of the sample demonstrated a reducing condition in the soil matrix. Based on the reducing condition present in the soil matrix, samples were not qualified for the low recoveries of the soluble and insoluble hexavalent chromium in matrix spikes.

7.3 Detection limits and Percent Solid

SDG 480-29598-1

The percent solid of sample OC-SB-528-0.0/1.0-XXX (27) was below the Region I validation guideline goal of 30. The reported detection of hexavalent chromium at 19 mg/kg was qualified estimated (J) in the final data set.

SDG 480-30346-1

The percent solid of sample OC-SB-521-0.0/1.0-XXX (18) was below the Region I validation guideline limit of 30. Hexavalent chromium was not detected and the final result was qualified rejected (R).

The following samples were analyzed at a dilution due to the dark color of the digestates. Hexavalent chromium was reported as not detected at elevated reporting limits:

Lab Sample ID	Field Sample ID	Parameter Name	Final Result (mg/kg)	Final Qual	Dilution Factor
480-29976-10	OC-SB-508-0.0/1.0-XXX	Chromium, Hexavalent	3	UJ	100
480-30346-10	OC-SB-509-0.0/1.0-XXX	Chromium, Hexavalent	27	UJ	1000
480-30346-4	OC-SB-519-0.0/1.0-XXX	Chromium, Hexavalent	30	UJ	1000
480-30346-7	OC-SB-518-0.0/1.0-XXX	Chromium, Hexavalent	28	UJ	1000

8.0 GENERAL CHEMISTRY

General chemistry includes analysis for percent solids/moisture by USEPA Method 160.3, pH by SW9045C and ORP by SM2580B. A chemist review was performed on these methods. Data were reviewed for the following parameters:

* Data Completeness
* Holding Time
* Blanks
* LCS
* Laboratory Duplicate 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. A summary of final results is presented on Table 2.8.

9.0 REFERENCES

APHA, 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW., Washington, D.C. 2005.

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MassDEP, 2004. "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)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

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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 chemist: Tige Cunningham – NRCC-EAC
Reviewed by QC Officer: Chris Ricardi – NRCC-EAC

TABLES

Table 1
Sample Summary
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

Location	Field Sample ID	Date Sampled	Lab Sample ID	SW8260C	SW8270	MAEPH	SW8270C	Organotins	SW6010	SW7199	SW9045C	A2580B	E160_3
				VOCs	SVOCs	EPH	EPH Target Compounds	Tributyltin	Metals	Cr6	pH	ORP	Percent Solid
SS-510	OC-SS-510-0.0/1.0-XXX	04-Dec-12	480-29484-1							1	1	1	2
SS-512	OC-SS-512-0.0/1.0-XXX	04-Dec-12	480-29484-2							1	1	1	2
SS-520	OC-SS-520-0.0/1.0-XXX	04-Dec-12	480-29484-3							1	1	1	2
SS-519	OC-SS-519-0.0/1.0-XXX	04-Dec-12	480-29484-4							1	1	1	2
SS-518	OC-SS-518-0.0/1.0-XXX	04-Dec-12	480-29484-5							1	1	1	2
SS-522	OC-SS-522-0.0/1.0-XXX	04-Dec-12	480-29484-6							1	1	1	2
SS-523	OC-SS-523-0.0/1.0-XXX	04-Dec-12	480-29484-7							1	1	1	2
SS-511	OC-SS-511-0.0/1.0-XXX	04-Dec-12	480-29484-8							1	1	1	2
SS-513	OC-SS-513-0.0/1.0-XXX	04-Dec-12	480-29484-9							1	1	1	2
SS-517	OC-SS-517-0.0/1.0-XXX	04-Dec-12	480-29484-10							1	1	1	2
SS-514	OC-SS-514-0.0/1.0-XXX	04-Dec-12	480-29484-11							1	1	1	2
SS-515	OC-SS-515-0.0/1.0-XXX	04-Dec-12	480-29484-12							1	1	1	2
SS-516	OC-SS-516-0.0/1.0-XXX	04-Dec-12	480-29484-13							1	1	1	2
SS-521	OC-SS-521-0.0/1.0-XXX	04-Dec-12	480-29484-14							1	1	1	2
SS-521	OC-DUP-1	04-Dec-12	480-29484-15							1	1	1	2
SS-524	OC-SS-524-0.0/1.0-XXX	05-Dec-12	480-29598-1							1	1	1	2
SS-525	OC-SS-525-0.0/1.0-XXX	05-Dec-12	480-29598-2							1	1	1	2
SB-526	OC-SB-526-0.0/1.0-XXX	05-Dec-12	480-29598-3		80					1	1	1	2
SB-526	OC-SB-526-1.0/3.0-XXX	05-Dec-12	480-29598-4		80					1	1	1	2
SB-527	OC-SB-527-0.0/1.0-XXX	05-Dec-12	480-29598-5							1	1	1	2
SB-527	OC-SB-527-1.0/3.0-XXX	05-Dec-12	480-29598-6							1	1	1	2
SB-528	OC-SB-528-0.0/1.0-XXX	05-Dec-12	480-29598-7		80			1	1	1	1	1	2
SB-528	OC-SB-528-1.0/3.0-XXX	05-Dec-12	480-29598-8		80			1	1	1	1	1	2
SB-529	OC-SB-529-0.0/1.0-XXX	05-Dec-12	480-29598-9		80					1	1	1	2
SB-529	OC-SB-529-1.0/3.0-XXX	05-Dec-12	480-29598-10		80					1	1	1	2
SB-528	OC-DUP-2	05-Dec-12	480-29598-11					1	1				2
SB-503	OC-SB-503-0.0/1.0-XXX	10-Dec-12	480-29895-1							1	1	1	2
SB-503	OC-SB-503-6.0/8.0-XXX	10-Dec-12	480-29895-2							1	1	1	2
SB-503	OC-SB-503-13/15-XXX	10-Dec-12	480-29895-3							1	1	1	2
SB-506	OC-SB-506-0.0/1.0-XXX	10-Dec-12	480-29895-4							1	1	1	2
SB-506	OC-SB-506-6.0/8.0-XXX	10-Dec-12	480-29895-5							1	1	1	2
SB-506	OC-SB-506-10/12-XXX	10-Dec-12	480-29895-6							1	1	1	2
SB-511	OC-SB-511-0.0/1.0-XXX	10-Dec-12	480-29895-7							1	1	1	2
SB-511	OC-SB-511-6.0/8.0-XXX	10-Dec-12	480-29895-8							1	1	1	2
SB-511	OC-SB-511-11/13-XXX	10-Dec-12	480-29895-9							1	1	1	2
SB-512	OC-SB-512-0.0/1.0-XXX	10-Dec-12	480-29895-10							1	1	1	2
SB-512	OC-SB-512-6.0/8.0-XXX	10-Dec-12	480-29895-11							1	1	1	2
SB-512	OC-SB-512-13/15-XXX	10-Dec-12	480-29895-12							1	1	1	2
SB-507	OC-SB-507-0.0/1.0-XXX	10-Dec-12	480-29895-13							1	1	1	
SB-507	OC-SB-507-6.0/8.0-XXX	10-Dec-12	480-29895-14							1	1	1	

Table 1
Sample Summary
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

Location	Field Sample ID	Date Sampled	Lab Sample ID	SW8260C	SW8270	MAEPH	SW8270C	Organotins	SW6010	SW7199	SW9045C	A2580B	E160_3
				VOCs	SVOCs	EPH	EPH Target Compounds	Tributyltin	Metals	Cr6	pH	ORP	Percent Solid
SB-507	OC-SB-507-13/15-XXX	10-Dec-12	480-29895-15							1	1	1	
SB-507	OC-SB-507-0.0/1.0-XXX	10-Dec-12	480-29963-1			21							2
SB-507	OC-SB-507-6.0/8.0-XXX	10-Dec-12	480-29963-2			21							2
SB-507	OC-SB-507-13/15-XXX	10-Dec-12	480-29963-3			21							2
SB-504	OC-SB-504-0.0/1.0-XXX	11-Dec-12	480-29976-1							1	1	1	2
SB-508	OC-SB-508-0.0/1.0-XXX	11-Dec-12	480-29976-10							1	1	1	2
SB-505	OC-SB-505-0.0/1.0-XXX	11-Dec-12	480-29976-3							1	1	1	2
SB-505	OC-SB-505-5.0/7.0-XXX	11-Dec-12	480-29976-4							1	1	1	2
SB-480	OC-SB-480-6.0/8.0-XXX	11-Dec-12	480-29976-5	2									2
SB-484	OC-SB-484-5.5/7.5-XXX	11-Dec-12	480-29976-6	2									2
SB-486	OC-SB-486-8.0/10-XXX	11-Dec-12	480-29976-7	2									2
SB-491	OC-SB-491-6.0/8.0-XXX	11-Dec-12	480-29976-8	2									2
SB-491	OC-DUP-3	11-Dec-12	480-29976-9	2									2
SB-508	OC-SB-508-8.0/10-XXX	11-Dec-12	480-29976-11							1	1	1	2
SB-508	OC-SB-508-12/14-XXX	11-Dec-12	480-29976-12							1	1	1	2
SB-504	OC-SB-504-7.5/9.5-XXX	11-Dec-12	480-29976-2							1	1	1	2
SB-513	OC-SB-513-0.0/1.0-XXX	12-Dec-12	480-30106-1							1	1	1	2
SB-513	OC-SB-513-7.0/9.0-XXX	12-Dec-12	480-30106-2							1	1	1	2
SB-513	OC-SB-513-10/12-XXX	12-Dec-12	480-30106-3							1	1	1	2
SB-514	OC-SB-514-0.0/1.0-XXX	12-Dec-12	480-30106-4	2	80	21				1	1	1	2
SB-514	OC-SB-514-7.0/9.0-XXX	12-Dec-12	480-30106-5		80	21				1	1	1	2
SB-514	OC-SB-514-15/17-XXX	12-Dec-12	480-30106-6		80	21				1	1	1	2
SB-515	OC-SB-515-6.0/8.0-XXX	12-Dec-12	480-30106-8	2	80	21							2
SB-515	OC-SB-515-13/15-XXX	12-Dec-12	480-30106-9	2	80	21							2
SB-516	OC-SB-516-6.0/8.0-XXX	12-Dec-12	480-30106-11	2	80	21							2
SB-516	OC-SB-516-15/17-XXX	12-Dec-12	480-30106-12	2	80	21							2
SB-517	OC-SB-517-0.0/1.0-XXX	12-Dec-12	480-30106-13	2	80	21				1	1	1	2
SB-517	OC-SB-517-6.0/8.0-XXX	12-Dec-12	480-30106-14	2	80	21				1	1	1	2
SB-517	OC-SB-517-18/20-XXX	12-Dec-12	480-30106-15	2	80	21				1	1	1	2
SB-524	OC-SB-524-0.0/1.0-XXX	12-Dec-12	480-30106-16							1	1	1	2
SB-524	OC-SB-524-8.0/10-XXX	12-Dec-12	480-30106-17							1	1	1	2
SB-524	OC-SB-524-27/29-XXX	12-Dec-12	480-30106-18							1	1	1	2
SB-523	OC-SB-523-0.0/1.0-XXX	12-Dec-12	480-30106-19							1	1	1	2
SB-523	OC-SB-523-6.0/8.0-XXX	12-Dec-12	480-30106-20							1	1	1	2
SB-523	OC-SB-523-22/24-XXX	12-Dec-12	480-30106-21							1	1	1	2
SB-514	OC-DUP-4	12-Dec-12	480-30106-22			21				1	1	1	2
SB-509	OC-SB-509-1.0/3.0-XXX	13-Dec-12	480-30197-1							1	1	1	2
SB-510	OC-SB-510-0.0/1.0-XXX	13-Dec-12	480-30197-2							1	1	1	2
SB-510	OC-SB-510-7.0/9.0-XXX	13-Dec-12	480-30197-3							1	1	1	2
SB-520	OC-SB-520-0.0/1.0-XXX	13-Dec-12	480-30197-4	2	80								2

Table 1
Sample Summary
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
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Wilmington, Massachusetts

Location	Field Sample ID	Date Sampled	Lab Sample ID	SW8260C	SW8270	MAEPH	SW8270C	Organotins	SW6010	SW7199	SW9045C	A2580B	E160_3
				VOCs	SVOCs	EPH	EPH Target Compounds	Tributyltin	Metals	Cr6	pH	ORP	Percent Solid
SB-520	OC-SB-520-8.0/10-XXX	13-Dec-12	480-30197-5	2	80								2
SB-520	OC-SB-520-18/20-XXX	13-Dec-12	480-30197-6	2	80								2
SB-522	OC-SB-522-0.0/1.0-XXX	13-Dec-12	480-30197-7		80					1	1	1	2
SB-522	OC-SB-522-8.0/10-XXX	13-Dec-12	480-30197-8		80					1	1	1	2
SB-522	OC-SB-522-13/15-XXX	13-Dec-12	480-30197-9		80					1	1	1	2
SB-525	OC-SB-525-0.0/1.0-XXX	13-Dec-12	480-30197-10							1	1	1	2
SB-525	OC-SB-525-3.0/5.0-XXX	13-Dec-12	480-30197-11							1	1	1	2
SB-525	OC-SB-525-18/20-XXX	13-Dec-12	480-30197-12							1	1	1	2
SB-533	OC-SB-533-0.0/1.0-XXX	13-Dec-12	480-30197-13			21							2
SB-533	OC-SB-533-6.0/8.0-XXX	13-Dec-12	480-30197-14			4	17						2
SB-533	OC-SB-533-13/15-XXX	13-Dec-12	480-30197-15			21							2
SB-532	OC-SB-532-0.0/1.0-XXX	13-Dec-12	480-30197-16			21							2
SB-532	OC-SB-532-6.0/8.0-XXX	13-Dec-12	480-30197-17			21							2
SB-532	OC-SB-532-11/13-XXX	13-Dec-12	480-30197-18			21							2
SB-534	OC-SB-534-0.0/1.0-XXX	13-Dec-12	480-30197-19			21							2
SB-534	OC-SB-534-7.0/9.0-XXX	13-Dec-12	480-30197-20			21							2
SB-521	OC-SB-521-0.0/1.0-XXX	14-Dec-12	480-30346-1							1	1	1	2
SB-521	OC-SB-521-8.0/10-XXX	14-Dec-12	480-30346-2							1	1	1	2
SB-521	OC-SB-521-16/18-XXX	14-Dec-12	480-30346-3							1	1	1	2
SB-519	OC-SB-519-0.0/1.0-XXX	14-Dec-12	480-30346-4		80					1	1	1	2
SB-519	OC-SB-519-8.0/10-XXX	14-Dec-12	480-30346-5		80					1	1	1	2
SB-519	OC-SB-519-12/14-XXX	14-Dec-12	480-30346-6		80					1	1	1	2
SB-518	OC-SB-518-0.0/1.0-XXX	14-Dec-12	480-30346-7	2	80					1	1	1	2
SB-518	OC-SB-518-8.0/10-XXX	14-Dec-12	480-30346-8	2	80					1	1	1	2
SB-518	OC-SB-518-13/15-XXX	14-Dec-12	480-30346-9	2	80					1	1	1	2
SB-509	OC-SB-509-0.0/1.0-XXX	14-Dec-12	480-30346-10							1	1	1	2

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

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

Table 2.2
Final Results Summary - VOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-480		SB-484		SB-486		SB-491		SB-491	
			Field Sample ID	OC-SB-480-6.0/8.0-XXX		OC-SB-484-5.5/7.5-XXX		OC-SB-486-8.0/10-XXX		OC-DUP-3		OC-SB-491-6.0/8.0-XXX	
			Field Sample Date	12/11/12		12/11/12		12/11/12		12/11/12		12/11/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29976-1		480-29976-1		480-29976-1		480-29976-1		480-29976-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8260C	2,4,4-Trimethyl-1-pentene	ug/kg	4.9	UJ	1.6	J	3700	J	4.9	UJ	4.9	UJ
N	SW8260C	2,4,4-Trimethyl-2-pentene	ug/kg	4.9	U	4.3	U	850	J	4.9	U	4.9	U

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
ug/kg = microgram per kilogram

Table 2.2
Final Results Summary - VOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-514		SB-515		SB-515		SB-516		SB-516	
			Field Sample ID	OC-SB-514-0.0/1.0-XXX		OC-SB-515-13/15-XXX		OC-SB-515-6.0/8.0-XXX		OC-SB-516-15/17-XXX		OC-SB-516-6.0/8.0-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8260C	2,4,4-Trimethyl-1-pentene	ug/kg	46	J	240	U	280	U	29	J	270	U
N	SW8260C	2,4,4-Trimethyl-2-pentene	ug/kg	320	U	240	U	280	U	310	U	270	U

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
ug/kg = microgram per kilogram

Table 2.2
Final Results Summary - VOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-517		SB-517		SB-517		SB-518		SB-518	
			Field Sample ID	OC-SB-517-0.0/1.0-XXX		OC-SB-517-18/20-XXX		OC-SB-517-6.0/8.0-XXX		OC-SB-518-0.0/1.0-XXX		OC-SB-518-13/15-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/14/12		12/14/12	
			QC Code	FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30346-1		480-30346-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8260C	2,4,4-Trimethyl-1-pentene	ug/kg	730		170	J	78	J	19		1.8	J
N	SW8260C	2,4,4-Trimethyl-2-pentene	ug/kg	260	J	38	J	340	U	17		1.3	J

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
ug/kg = microgram per kilogram

Table 2.2
Final Results Summary - VOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-518		SB-520		SB-520		SB-520	
			Field Sample ID	OC-SB-518-8.0/10-XXX		OC-SB-520-0.0/1.0-XXX		OC-SB-520-18/20-XXX		OC-SB-520-8.0/10-XXX	
			Field Sample Date	12/14/12		12/13/12		12/13/12		12/13/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30346-1		480-30197-1		480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8260C	2,4,4-Trimethyl-1-pentene	ug/kg	5.1	U	4.8	UJ	1.4	J	4.8	UJ
N	SW8260C	2,4,4-Trimethyl-2-pentene	ug/kg	0.94	J	4.8	U	1.1	J	1.4	J

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
ug/kg = microgram per kilogram

Prepared by / Date: KJC 02/18/13
Checked by / Date: TLC 02/19/13

Table 2.3
Final Results Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-514		SB-514		SB-514		SB-515		SB-515		SB-516	
			Field Sample ID	OC-SB-514-0.0/1.0-XXX		OC-SB-514-15/17-XXX		OC-SB-514-7.0/9.0-XXX		OC-SB-515-13/15-XXX		OC-SB-515-6.0/8.0-XXX		OC-SB-516-15/17-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	1,2,4,5-Tetrachlorobenzene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	1,2,4-Trichlorobenzene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	1,2-Dichlorobenzene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	1,3-Dichlorobenzene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	1,4-Dichlorobenzene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	1-Methylnaphthalene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	2,3,4,6-Tetrachlorophenol	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	2,4,5-Trichlorophenol	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	2,4,6-Trichlorophenol	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	2,4-Dichlorophenol	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	2,4-Dimethylphenol	ug/kg	43	U	36	UJ	42	UJ	39	U	39	UJ	42	UJ
N	SW8270	2,4-Dinitrophenol	ug/kg	43	UJ		R		R	39	UJ		R		R
N	SW8270	2,4-Dinitrotoluene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	2,6-Dinitrotoluene	ug/kg	43	U	36	UJ	42	UJ	39	U	39	UJ	42	UJ
N	SW8270	2-Chloronaphthalene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	2-Chlorophenol	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	2-Methylnaphthalene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	2-Methylphenol	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	2-Nitroaniline	ug/kg	220	U	180	U	210	U	190	U	200	U	210	U
N	SW8270	2-Nitrophenol	ug/kg	43	U	36	UJ	42	UJ	39	U	39	UJ	42	UJ
N	SW8270	3 & 4 Methylphenol	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	3,3'-Dichlorobenzidine	ug/kg	86	U	72	U	84	U	78	U	78	U	85	U
N	SW8270	3-Nitroaniline	ug/kg	220	U	180	U	210	U	190	U	200	U	210	U
N	SW8270	4,6-Dinitro-2-methylphenol	ug/kg	220	U	180	U	210	U	190	U	200	U	210	U
N	SW8270	4-Bromophenyl phenyl ether	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	4-Chloro-3-methylphenol	ug/kg	86	U	72	UJ	84	U	78	U	78	U	85	U
N	SW8270	4-Chloroaniline	ug/kg	86	U	72	UJ	84	UJ	78	U	78	UJ	85	UJ
N	SW8270	4-Chlorophenyl phenyl ether	ug/kg	43	U	36	U	42	U	39	U	39	U	17	J
N	SW8270	4-Methylphenol	ug/kg	43	U	36	UJ	42	UJ	39	U	39	UJ	42	UJ
N	SW8270	4-Nitroaniline	ug/kg	220	UJ	180	U	210	U	190	UJ	200	U	210	U
N	SW8270	4-Nitrophenol	ug/kg	220	UJ		R		R	190	UJ		R		R
N	SW8270	Acenaphthene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Acenaphthylene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Acetophenone	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Aniline	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Anthracene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Atrazine	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Azobenzene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Benzaldehyde	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Benzo(a)anthracene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Benzo(a)pyrene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Benzo(b)fluoranthene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Benzo(ghi)perylene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Benzo(k)fluoranthene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Benzoic Acid	ug/kg	220	U	180	UJ	210	UJ	190	U	200	UJ	210	UJ

Table 2.3
Final Results Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-514		SB-514		SB-514		SB-515		SB-515		SB-516	
			Field Sample ID	OC-SB-514-0.0/1.0-XXX		OC-SB-514-15/17-XXX		OC-SB-514-7.0/9.0-XXX		OC-SB-515-13/15-XXX		OC-SB-515-6.0/8.0-XXX		OC-SB-516-15/17-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	Benzyl alcohol	ug/kg	86	U	R		R		78	U	R		R	
N	SW8270	Biphenyl	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Bis(2-Chloroethoxy)methane	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Bis(2-Chloroethyl)ether	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Bis(2-Chloroisopropyl)ether	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Bis(2-Ethylhexyl)phthalate	ug/kg	330		180	U	210	U	190	U	200	U	210	U
N	SW8270	Butylbenzylphthalate	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Caprolactam	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Carbazole	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Chrysene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Di-n-butylphthalate	ug/kg	220	U	180	U	210	U	190	U	200	U	210	U
N	SW8270	Di-n-octylphthalate	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Dibenz(a,h)anthracene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Dibenzofuran	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Diethylphthalate	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Dimethylphthalate	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Diphenyl ether	ug/kg	43	U	36	U	42	U	39	U	39	U	43	
N	SW8270	Diphenylmethanone	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Fluoranthene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Fluorene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Hexachlorobenzene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Hexachlorobutadiene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Hexachlorocyclopentadiene	ug/kg	86	U	72	U	84	U	78	U	78	U	85	U
N	SW8270	Hexachloroethane	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Indeno(1,2,3-cd)pyrene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Isophorone	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	N-Nitrosodi-n-propylamine	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	N-Nitrosodimethylamine	ug/kg	43	U	36	UJ	42	UJ	39	U	39	UJ	42	UJ
N	SW8270	N-Nitrosodiphenylamine	ug/kg	43	U	36	UJ	42	U	39	U	39	U	42	U
N	SW8270	Naphthalene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Nitrobenzene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Pentachlorophenol	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Phenanthrene	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Phenol	ug/kg	43	U	36	U	42	U	39	U	39	U	42	U
N	SW8270	Pyrene	ug/kg	20	J	36	U	42	U	39	U	39	U	42	U

Notes:

N = normal

FS = field sample

FD = field duplicate

J = value is estimated

R = value is rejected

ug/kg = microgram per kilogram

Table 2.3
Final Results Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-514		SB-514		SB-514		SB-515		SB-515		SB-516	
			Field Sample ID	OC-SB-514-0.0/1.0-XXX		OC-SB-514-15/17-XXX		OC-SB-514-7.0/9.0-XXX		OC-SB-515-13/15-XXX		OC-SB-515-6.0/8.0-XXX		OC-SB-516-15/17-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual

U = not detected, value is the detection limit

Table 2.3
Final Results Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-516		SB-517		SB-517		SB-517		SB-518		SB-518	
			Field Sample ID	OC-SB-516-6.0/8.0-XXX		OC-SB-517-0.0/1.0-XXX		OC-SB-517-18/20-XXX		OC-SB-517-6.0/8.0-XXX		OC-SB-518-0.0/1.0-XXX		OC-SB-518-13/15-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/14/12		12/14/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30346-1		480-30346-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	1,2,4,5-Tetrachlorobenzene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	1,2,4-Trichlorobenzene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	1,2-Dichlorobenzene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	1,3-Dichlorobenzene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	1,4-Dichlorobenzene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	1-Methylnaphthalene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	2,3,4,6-Tetrachlorophenol	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	2,4,5-Trichlorophenol	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	2,4,6-Trichlorophenol	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	2,4-Dichlorophenol	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	2,4-Dimethylphenol	ug/kg	40	UJ	36	UJ	42	UJ	37	UJ	23000	U	820	U
N	SW8270	2,4-Dinitrophenol	ug/kg		R		R		R		R	23000	UJ	820	UJ
N	SW8270	2,4-Dinitrotoluene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	2,6-Dinitrotoluene	ug/kg	40	UJ	36	UJ	42	UJ	37	UJ	23000	U	820	U
N	SW8270	2-Chloronaphthalene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	2-Chlorophenol	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	2-Methylnaphthalene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	2-Methylphenol	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	2-Nitroaniline	ug/kg	200	U	180	U	210	U	180	U	110000	U	4100	U
N	SW8270	2-Nitrophenol	ug/kg	40	UJ	36	UJ	42	UJ	37	UJ	23000	U	820	U
N	SW8270	3 & 4 Methylphenol	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	3,3'-Dichlorobenzidine	ug/kg	79	U	72	U	85	U	74	U	46000	U	1600	U
N	SW8270	3-Nitroaniline	ug/kg	200	U	180	U	210	U	180	U	110000	U	4100	U
N	SW8270	4,6-Dinitro-2-methylphenol	ug/kg	200	U	180	U	210	U	180	U	110000	U	4100	U
N	SW8270	4-Bromophenyl phenyl ether	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	4-Chloro-3-methylphenol	ug/kg	79	U	72	U	85	U	74	U	46000	U	1600	U
N	SW8270	4-Chloroaniline	ug/kg	79	UJ	72	UJ	85	UJ	74	UJ	46000	U	1600	U
N	SW8270	4-Chlorophenyl phenyl ether	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	4-Methylphenol	ug/kg	40	UJ	36	UJ	42	UJ	37	UJ	23000	U	820	U
N	SW8270	4-Nitroaniline	ug/kg	200	U	180	U	210	U	180	U	110000	U	4100	U
N	SW8270	4-Nitrophenol	ug/kg		R		R		R		R	110000	UJ	4100	UJ
N	SW8270	Acenaphthene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Acenaphthylene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Acetophenone	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Aniline	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Anthracene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Atrazine	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Azobenzene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Benzaldehyde	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Benzo(a)anthracene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Benzo(a)pyrene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Benzo(b)fluoranthene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Benzo(ghi)perylene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Benzo(k)fluoranthene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Benzoic Acid	ug/kg	200	UJ	180	UJ	210	UJ	180	UJ	110000	U	4100	U

Table 2.3
Final Results Summary - SVOCs
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Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-516		SB-517		SB-517		SB-517		SB-518		SB-518	
			Field Sample ID	OC-SB-516-6.0/8.0-XXX		OC-SB-517-0.0/1.0-XXX		OC-SB-517-18/20-XXX		OC-SB-517-6.0/8.0-XXX		OC-SB-518-0.0/1.0-XXX		OC-SB-518-13/15-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/14/12		12/14/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30346-1		480-30346-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	Benzyl alcohol	ug/kg	R		R		R		R		46000	U	1600	U
N	SW8270	Biphenyl	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Bis(2-Chloroethoxy)methane	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Bis(2-Chloroethyl)ether	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Bis(2-Chloroisopropyl)ether	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Bis(2-Ethylhexyl)phthalate	ug/kg	200	U	12000		210	U	3300		340000		12000	
N	SW8270	Butylbenzylphthalate	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Caprolactam	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Carbazole	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Chrysene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Di-n-butylphthalate	ug/kg	200	U	180	U	210	U	180	U	110000	U	4100	U
N	SW8270	Di-n-octylphthalate	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Dibenz(a,h)anthracene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Dibenzofuran	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Diethylphthalate	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Dimethylphthalate	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Diphenyl ether	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Diphenylmethanone	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Fluoranthene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Fluorene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Hexachlorobenzene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Hexachlorobutadiene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Hexachlorocyclopentadiene	ug/kg	79	U	72	U	85	U	74	U	46000	U	1600	U
N	SW8270	Hexachloroethane	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Indeno(1,2,3-cd)pyrene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Isophorone	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	N-Nitrosodi-n-propylamine	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	N-Nitrosodimethylamine	ug/kg	40	UJ	36	UJ	42	UJ	37	UJ	23000	U	820	U
N	SW8270	N-Nitrosodiphenylamine	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Naphthalene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Nitrobenzene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Pentachlorophenol	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Phenanthrene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Phenol	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U
N	SW8270	Pyrene	ug/kg	40	U	36	U	42	U	37	U	23000	U	820	U

Notes:

N = normal

FS = field sample

FD = field duplicate

J = value is estimated

R = value is rejected

ug/kg = microgram per kilogram

Table 2.3
Final Results Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-516		SB-517		SB-517		SB-517		SB-518		SB-518	
			Field Sample ID	OC-SB-516-6.0/8.0-XXX		OC-SB-517-0.0/1.0-XXX		OC-SB-517-18/20-XXX		OC-SB-517-6.0/8.0-XXX		OC-SB-518-0.0/1.0-XXX		OC-SB-518-13/15-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/14/12		12/14/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30346-1		480-30346-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual

U = not detected, value is the detection limit

Table 2.3
Final Results Summary - SVOCs
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Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-518		SB-519		SB-519		SB-519		SB-520		SB-520	
			Field Sample ID	OC-SB-518-8.0/10-XXX		OC-SB-519-0.0/1.0-XXX		OC-SB-519-12/14-XXX		OC-SB-519-8.0/10-XXX		OC-SB-520-0.0/1.0-XXX		OC-SB-520-18/20-XXX	
			Field Sample Date	12/14/12		12/14/12		12/14/12		12/14/12		12/13/12		12/13/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30346-1		480-30346-1		480-30346-1		480-30346-1		480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	1,2,4,5-Tetrachlorobenzene	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	1,2,4-Trichlorobenzene	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	1,2-Dichlorobenzene	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	1,3-Dichlorobenzene	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	1,4-Dichlorobenzene	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	1-Methylnaphthalene	ug/kg	42	U	50	U	42	U	44	U	55		35	U
N	SW8270	2,3,4,6-Tetrachlorophenol	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	2,4,5-Trichlorophenol	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	2,4,6-Trichlorophenol	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	2,4-Dichlorophenol	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	2,4-Dimethylphenol	ug/kg	42	U	50	U	42	U	44	U	39	UJ	35	UJ
N	SW8270	2,4-Dinitrophenol	ug/kg	42	UJ	50	UJ	42	UJ	44	UJ	R		R	
N	SW8270	2,4-Dinitrotoluene	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	2,6-Dinitrotoluene	ug/kg	42	U	50	U	42	U	44	U	39	UJ	35	UJ
N	SW8270	2-Chloronaphthalene	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	2-Chlorophenol	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	2-Methylnaphthalene	ug/kg	42	U	50	U	42	U	44	U	80		35	U
N	SW8270	2-Methylphenol	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	2-Nitroaniline	ug/kg	210	U	250	U	210	U	220	U	200	U	180	U
N	SW8270	2-Nitrophenol	ug/kg	42	U	50	U	42	U	44	U	39	UJ	35	UJ
N	SW8270	3 & 4 Methylphenol	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	3,3'-Dichlorobenzidine	ug/kg	83	U	100	U	84	U	88	U	79	U	71	U
N	SW8270	3-Nitroaniline	ug/kg	210	U	250	U	210	U	220	U	200	U	180	U
N	SW8270	4,6-Dinitro-2-methylphenol	ug/kg	210	U	250	U	210	U	220	U	200	U	180	U
N	SW8270	4-Bromophenyl phenyl ether	ug/kg	42	UJ	50	U	42	UJ	44	UJ	39	U	35	U
N	SW8270	4-Chloro-3-methylphenol	ug/kg	83	U	100	U	84	U	88	U	79	U	71	U
N	SW8270	4-Chloroaniline	ug/kg	83	U	100	U	84	U	88	U	79	UJ	71	UJ
N	SW8270	4-Chlorophenyl phenyl ether	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	4-Methylphenol	ug/kg	42	U	50	U	42	U	44	U	39	UJ	35	UJ
N	SW8270	4-Nitroaniline	ug/kg	210	U	250	U	210	U	220	U	200	U	180	U
N	SW8270	4-Nitrophenol	ug/kg	210	UJ	250	UJ	210	UJ	220	UJ	R		R	
N	SW8270	Acenaphthene	ug/kg	42	U	50	U	42	U	44	U	100		35	U
N	SW8270	Acenaphthylene	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Acetophenone	ug/kg	42	U	20	J	42	U	44	U	39	U	35	U
N	SW8270	Aniline	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Anthracene	ug/kg	42	UJ	94		42	UJ	44	UJ	290		35	U
N	SW8270	Atrazine	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Azobenzene	ug/kg	42	UJ	50	U	42	UJ	44	UJ	39	U	35	U
N	SW8270	Benzaldehyde	ug/kg	42	U	160		42	U	44	U	13	J	35	U
N	SW8270	Benzo(a)anthracene	ug/kg	42	U	120		42	U	44	U	430		35	U
N	SW8270	Benzo(a)pyrene	ug/kg	42	U	30	J	42	U	44	UJ	360		35	U
N	SW8270	Benzo(b)fluoranthene	ug/kg	42	U	50	U	42	U	44	UJ	460		35	U
N	SW8270	Benzo(ghi)perylene	ug/kg	42	U	15	J	42	U	44	UJ	140		35	U
N	SW8270	Benzo(k)fluoranthene	ug/kg	42	U	50	U	42	U	44	UJ	190		35	U
N	SW8270	Benzoic Acid	ug/kg	210	U	250	U	210	U	220	U	200	U	180	U

Table 2.3
Final Results Summary - SVOCs
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			Loc Name	SB-518		SB-519		SB-519		SB-519		SB-520		SB-520	
			Field Sample ID	OC-SB-518-8.0/10-XXX		OC-SB-519-0.0/1.0-XXX		OC-SB-519-12/14-XXX		OC-SB-519-8.0/10-XXX		OC-SB-520-0.0/1.0-XXX		OC-SB-520-18/20-XXX	
			Field Sample Date	12/14/12		12/14/12		12/14/12		12/14/12		12/13/12		12/13/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30346-1		480-30346-1		480-30346-1		480-30346-1		480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	Benzyl alcohol	ug/kg	83	U	100	U	84	U	88	U	R		R	
N	SW8270	Biphenyl	ug/kg	42	U	32	J	42	U	44	U	24	J	35	U
N	SW8270	Bis(2-Chloroethoxy)methane	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Bis(2-Chloroethyl)ether	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Bis(2-Chloroisopropyl)ether	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Bis(2-Ethylhexyl)phthalate	ug/kg	210	U	4900		210	U	220	U	97	J	180	U
N	SW8270	Butylbenzylphthalate	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Caprolactam	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Carbazole	ug/kg	42	UJ	50	U	42	UJ	44	UJ	96		35	U
N	SW8270	Chrysene	ug/kg	42	U	100		42	U	44	U	340		35	U
N	SW8270	Di-n-butylphthalate	ug/kg	210	UJ	250	U	210	UJ	220	UJ	200	U	180	U
N	SW8270	Di-n-octylphthalate	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Dibenz(a,h)anthracene	ug/kg	42	U	50	U	42	U	44	UJ	39	U	35	U
N	SW8270	Dibenzofuran	ug/kg	42	U	50	U	42	U	44	U	130		35	U
N	SW8270	Diethylphthalate	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Dimethylphthalate	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Diphenyl ether	ug/kg	42	U	120		42	U	44	U	39	U	35	U
N	SW8270	Diphenylmethanone	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Fluoranthene	ug/kg	42	UJ	220		42	UJ	44	UJ	860	J	35	U
N	SW8270	Fluorene	ug/kg	42	U	50	U	42	U	44	U	160		35	U
N	SW8270	Hexachlorobenzene	ug/kg	42	UJ	50	U	42	UJ	44	UJ	39	U	35	U
N	SW8270	Hexachlorobutadiene	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Hexachlorocyclopentadiene	ug/kg	83	U	100	U	84	U	88	U	79	U	71	U
N	SW8270	Hexachloroethane	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Indeno(1,2,3-cd)pyrene	ug/kg	42	U	50	U	42	U	44	UJ	130		35	U
N	SW8270	Isophorone	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	N-Nitrosodi-n-propylamine	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	N-Nitrosodimethylamine	ug/kg	42	U	50	U	42	U	44	U	39	UJ	35	UJ
N	SW8270	N-Nitrosodiphenylamine	ug/kg	42	UJ	110		42	UJ	50	J	39	UJ	26	J
N	SW8270	Naphthalene	ug/kg	42	U	50	U	42	U	44	U	200		35	U
N	SW8270	Nitrobenzene	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Pentachlorophenol	ug/kg	42	UJ	50	U	42	UJ	44	UJ	39	U	35	U
N	SW8270	Phenanthrene	ug/kg	42	UJ	96		42	UJ	44	UJ	1100	J	35	U
N	SW8270	Phenol	ug/kg	42	U	50	U	42	U	44	U	39	U	35	U
N	SW8270	Pyrene	ug/kg	42	U	170		42	U	44	U	690		35	U

Notes:

N = normal

FS = field sample

FD = field duplicate

J = value is estimated

R = value is rejected

ug/kg = microgram per kilogram

Table 2.3
Final Results Summary - SVOCs
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			Loc Name	SB-518		SB-519		SB-519		SB-519		SB-520		SB-520	
			Field Sample ID	OC-SB-518-8.0/10-XXX		OC-SB-519-0.0/1.0-XXX		OC-SB-519-12/14-XXX		OC-SB-519-8.0/10-XXX		OC-SB-520-0.0/1.0-XXX		OC-SB-520-18/20-XXX	
			Field Sample Date	12/14/12		12/14/12		12/14/12		12/14/12		12/13/12		12/13/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30346-1		480-30346-1		480-30346-1		480-30346-1		480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual

U = not detected, value is the detection limit

Table 2.3
Final Results Summary - SVOCs
Data Validation Report
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			Loc Name	SB-520		SB-522		SB-522		SB-522		SB-526		SB-526	
			Field Sample ID	OC-SB-520-8.0/10-XXX		OC-SB-522-0.0/1.0-XXX		OC-SB-522-13/15-XXX		OC-SB-522-8.0/10-XXX		OC-SB-526-0.0/1.0-XXX		OC-SB-526-1.0/3.0-XXX	
			Field Sample Date	12/13/12		12/13/12		12/13/12		12/13/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30197-1		480-30197-1		480-30197-1		480-30197-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	1,2,4,5-Tetrachlorobenzene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	1,2,4-Trichlorobenzene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	1,2-Dichlorobenzene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	1,3-Dichlorobenzene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	1,4-Dichlorobenzene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	1-Methylnaphthalene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	2,3,4,6-Tetrachlorophenol	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	2,4,5-Trichlorophenol	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	2,4,6-Trichlorophenol	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	2,4-Dichlorophenol	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	2,4-Dimethylphenol	ug/kg	35	UJ	40	UJ	40	UJ	4100	UJ	56	U	44	U
N	SW8270	2,4-Dinitrophenol	ug/kg		R		R		R		R	56	U	44	U
N	SW8270	2,4-Dinitrotoluene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	2,6-Dinitrotoluene	ug/kg	35	UJ	40	UJ	40	UJ	4100	UJ	56	U	44	U
N	SW8270	2-Chloronaphthalene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	2-Chlorophenol	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	2-Methylnaphthalene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	2-Methylphenol	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	2-Nitroaniline	ug/kg	180	U	200	U	200	U	20000	U	280	U	220	U
N	SW8270	2-Nitrophenol	ug/kg	35	UJ	40	UJ	40	UJ	4100	UJ	56	U	44	U
N	SW8270	3 & 4 Methylphenol	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	3,3'-Dichlorobenzidine	ug/kg	70	U	81	U	80	U	8100	U	110	U	88	U
N	SW8270	3-Nitroaniline	ug/kg	180	U	200	U	200	U	20000	U	280	U	220	U
N	SW8270	4,6-Dinitro-2-methylphenol	ug/kg	180	U	200	U	200	U	20000	U	280	U	220	U
N	SW8270	4-Bromophenyl phenyl ether	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	4-Chloro-3-methylphenol	ug/kg	70	U	81	U	80	U	8100	U	110	U	88	U
N	SW8270	4-Chloroaniline	ug/kg	70	UJ	81	UJ	80	UJ	8100	UJ	110	U	88	U
N	SW8270	4-Chlorophenyl phenyl ether	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	4-Methylphenol	ug/kg	35	UJ	40	UJ	40	UJ	4100	UJ	56	U	44	U
N	SW8270	4-Nitroaniline	ug/kg	180	U	200	U	200	U	20000	U	280	U	220	U
N	SW8270	4-Nitrophenol	ug/kg		R		R		R		R		R		R
N	SW8270	Acenaphthene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Acenaphthylene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Acetophenone	ug/kg	35	U	13	J	40	U	4100	U	56	U	44	U
N	SW8270	Aniline	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Anthracene	ug/kg	35	U	88		40	U	4100	U	56	U	44	U
N	SW8270	Atrazine	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Azobenzene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Benzaldehyde	ug/kg	35	U	120		40	U	4100	U	56		44	U
N	SW8270	Benzo(a)anthracene	ug/kg	35	U	75		40	U	4100	U	56	U	44	U
N	SW8270	Benzo(a)pyrene	ug/kg	35	U	82		40	U	4100	U	56	U	44	U
N	SW8270	Benzo(b)fluoranthene	ug/kg	35	U	140		40	U	4100	U	56	U	44	U
N	SW8270	Benzo(ghi)perylene	ug/kg	35	U	34	J	40	U	4100	U	56	U	44	U
N	SW8270	Benzo(k)fluoranthene	ug/kg	35	U	56		40	U	4100	U	56	U	44	U
N	SW8270	Benzoic Acid	ug/kg	180	U	200	U	200	U	20000	U		R		R

Table 2.3
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Olin Chemical Superfund Site
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			Loc Name	SB-520		SB-522		SB-522		SB-522		SB-526		SB-526	
			Field Sample ID	OC-SB-520-8.0/10-XXX		OC-SB-522-0.0/1.0-XXX		OC-SB-522-13/15-XXX		OC-SB-522-8.0/10-XXX		OC-SB-526-0.0/1.0-XXX		OC-SB-526-1.0/3.0-XXX	
			Field Sample Date	12/13/12		12/13/12		12/13/12		12/13/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30197-1		480-30197-1		480-30197-1		480-30197-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	Benzyl alcohol	ug/kg	R		R		R		R		R		R	
N	SW8270	Biphenyl	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Bis(2-Chloroethoxy)methane	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Bis(2-Chloroethyl)ether	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Bis(2-Chloroisopropyl)ether	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Bis(2-Ethylhexyl)phthalate	ug/kg	180	U	150	J	200	U	29000		280	U	220	U
N	SW8270	Butylbenzylphthalate	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Caprolactam	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Carbazole	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Chrysene	ug/kg	35	U	97		40	U	4100	U	56	U	44	U
N	SW8270	Di-n-butylphthalate	ug/kg	180	U	200	U	200	U	20000	U	280	U	220	U
N	SW8270	Di-n-octylphthalate	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Dibenz(a,h)anthracene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Dibenzofuran	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Diethylphthalate	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Dimethylphthalate	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Diphenyl ether	ug/kg	43		40	U	40	U	4100	U	56	U	44	U
N	SW8270	Diphenylmethanone	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Fluoranthene	ug/kg	35	U	180		40	U	4100	U	56	U	44	U
N	SW8270	Fluorene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Hexachlorobenzene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Hexachlorobutadiene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Hexachlorocyclopentadiene	ug/kg	70	U	81	U	80	U	8100	U	110	U	88	U
N	SW8270	Hexachloroethane	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Indeno(1,2,3-cd)pyrene	ug/kg	35	U	34	J	40	U	4100	U	56	U	44	U
N	SW8270	Isophorone	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	N-Nitrosodi-n-propylamine	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	N-Nitrosodimethylamine	ug/kg	35	UJ	40	UJ	40	UJ	4100	UJ	56	U	44	U
N	SW8270	N-Nitrosodiphenylamine	ug/kg	31	J	20	J	40	UJ	4100	UJ	56	U	44	U
N	SW8270	Naphthalene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Nitrobenzene	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Pentachlorophenol	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Phenanthrene	ug/kg	35	U	90		40	U	4100	U	56	U	44	U
N	SW8270	Phenol	ug/kg	35	U	40	U	40	U	4100	U	56	U	44	U
N	SW8270	Pyrene	ug/kg	35	U	130		40	U	4100	U	56	U	44	U

Notes:

N = normal

FS = field sample

FD = field duplicate

J = value is estimated

R = value is rejected

ug/kg = microgram per kilogram

Table 2.3
Final Results Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-520		SB-522		SB-522		SB-522		SB-526		SB-526	
			Field Sample ID	OC-SB-520-8.0/10-XXX		OC-SB-522-0.0/1.0-XXX		OC-SB-522-13/15-XXX		OC-SB-522-8.0/10-XXX		OC-SB-526-0.0/1.0-XXX		OC-SB-526-1.0/3.0-XXX	
			Field Sample Date	12/13/12		12/13/12		12/13/12		12/13/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30197-1		480-30197-1		480-30197-1		480-30197-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual

U = not detected, value is the detection limit

Table 2.3
Final Results Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-528		SB-528		SB-529		SB-529	
			Field Sample ID	OC-SB-528-0.0/1.0-XXX		OC-SB-528-1.0/3.0-XXX		OC-SB-529-0.0/1.0-XXX		OC-SB-529-1.0/3.0-XXX	
			Field Sample Date	12/05/12		12/05/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29598-1		480-29598-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	1,2,4,5-Tetrachlorobenzene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	1,2,4-Trichlorobenzene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	1,2-Dichlorobenzene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	1,3-Dichlorobenzene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	1,4-Dichlorobenzene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	1-Methylnaphthalene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2,3,4,6-Tetrachlorophenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2,4,5-Trichlorophenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2,4,6-Trichlorophenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2,4-Dichlorophenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2,4-Dimethylphenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2,4-Dinitrophenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2,4-Dinitrotoluene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2,6-Dinitrotoluene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2-Chloronaphthalene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2-Chlorophenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2-Methylnaphthalene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2-Methylphenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	2-Nitroaniline	ug/kg	R		7900	U	280	U	210	U
N	SW8270	2-Nitrophenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	3 & 4 Methylphenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	3,3'-Dichlorobenzidine	ug/kg	R		3200	U	110	U	84	U
N	SW8270	3-Nitroaniline	ug/kg	R		7900	U	280	U	210	U
N	SW8270	4,6-Dinitro-2-methylphenol	ug/kg	R		7900	U	280	U	210	U
N	SW8270	4-Bromophenyl phenyl ether	ug/kg	R		1600	U	56	U	42	U
N	SW8270	4-Chloro-3-methylphenol	ug/kg	R		3200	U	110	U	84	U
N	SW8270	4-Chloroaniline	ug/kg	R		3200	U	110	U	84	U
N	SW8270	4-Chlorophenyl phenyl ether	ug/kg	R		1600	U	56	U	42	U
N	SW8270	4-Methylphenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	4-Nitroaniline	ug/kg	R		7900	U	280	U	210	U
N	SW8270	4-Nitrophenol	ug/kg	R		R		R		R	
N	SW8270	Acenaphthene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Acenaphthylene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Acetophenone	ug/kg	R		1600	U	18	J	42	U
N	SW8270	Aniline	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Anthracene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Atrazine	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Azobenzene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Benzaldehyde	ug/kg	R		1600	U	97		42	U
N	SW8270	Benzo(a)anthracene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Benzo(a)pyrene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Benzo(b)fluoranthene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Benzo(ghi)perylene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Benzo(k)fluoranthene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Benzoic Acid	ug/kg	R		R		R		R	

Table 2.3
Final Results Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-528		SB-528		SB-529		SB-529	
			Field Sample ID	OC-SB-528-0.0/1.0-XXX		OC-SB-528-1.0/3.0-XXX		OC-SB-529-0.0/1.0-XXX		OC-SB-529-1.0/3.0-XXX	
			Field Sample Date	12/05/12		12/05/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29598-1		480-29598-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW8270	Benzyl alcohol	ug/kg	R		R		R		R	
N	SW8270	Biphenyl	ug/kg	930	J	1600	U	56	U	42	U
N	SW8270	Bis(2-Chloroethoxy)methane	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Bis(2-Chloroethyl)ether	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Bis(2-Chloroisopropyl)ether	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Bis(2-Ethylhexyl)phthalate	ug/kg	41000	J	11000		280	U	210	U
N	SW8270	Butylbenzylphthalate	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Caprolactam	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Carbazole	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Chrysene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Di-n-butylphthalate	ug/kg	R		7900	U	280	U	210	U
N	SW8270	Di-n-octylphthalate	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Dibenz(a,h)anthracene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Dibenzofuran	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Diethylphthalate	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Dimethylphthalate	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Diphenyl ether	ug/kg	1900	J	820	J	56	U	42	U
N	SW8270	Diphenylmethanone	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Fluoranthene	ug/kg	R		1600	U	18	J	42	U
N	SW8270	Fluorene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Hexachlorobenzene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Hexachlorobutadiene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Hexachlorocyclopentadiene	ug/kg	R		3200	U	110	U	84	U
N	SW8270	Hexachloroethane	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Indeno(1,2,3-cd)pyrene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Isophorone	ug/kg	R		1600	U	56	U	42	U
N	SW8270	N-Nitrosodi-n-propylamine	ug/kg	R		1600	U	56	U	42	U
N	SW8270	N-Nitrosodimethylamine	ug/kg	R		1600	U	56	U	42	U
N	SW8270	N-Nitrosodiphenylamine	ug/kg	1300	J	1600	U	56	U	42	U
N	SW8270	Naphthalene	ug/kg	R		1600	U	26	J	42	U
N	SW8270	Nitrobenzene	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Pentachlorophenol	ug/kg	R		1600	U	56	U	42	U
N	SW8270	Phenanthrene	ug/kg	R		1600	U	23	J	42	U
N	SW8270	Phenol	ug/kg	R		1600	U	24	J	42	U
N	SW8270	Pyrene	ug/kg	R		1600	U	56	U	42	U

Notes:

N = normal

FS = field sample

FD = field duplicate

J = value is estimated

R = value is rejected

ug/kg = microgram per kilogram

Prepared by / Date: KJC 03/15/13

Checked by / Date: TLC 03/15/13

Table 2.3
Final Results Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-528		SB-528		SB-529		SB-529		
			Field Sample ID	OC-SB-528-0.0/1.0-XXX		OC-SB-528-1.0/3.0-XXX		OC-SB-529-0.0/1.0-XXX		OC-SB-529-1.0/3.0-XXX		
			Field Sample Date	12/05/12		12/05/12		12/05/12		12/05/12		
			QC Code	FS		FS		FS		FS		
			Lab Sample Delivery Group	480-29598-1		480-29598-1		480-29598-1		480-29598-1		
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	

U = not detected, value is the detection limit

Table 2.4
Final Results Summary - EPH
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-507		SB-507		SB-507		SB-514	
			Field Sample ID	OC-SB-507-0.0/1.0-XXX		OC-SB-507-13/15-XXX		OC-SB-507-6.0/8.0-XXX		OC-DUP-4	
			Field Sample Date	12/10/12		12/10/12		12/10/12		12/12/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29895-1		480-29895-1		480-29895-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	MAEPH	2-Methylnaphthalene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Acenaphthene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Acenaphthylene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Anthracene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Benzo(a)anthracene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Benzo(a)pyrene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Benzo(b)fluoranthene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Benzo(ghi)perylene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Benzo(k)fluoranthene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Chrysene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Dibenz(a,h)anthracene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Fluoranthene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Fluorene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Indeno(1,2,3-cd)pyrene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Naphthalene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Phenanthrene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	Pyrene	mg/kg	1	U	1.1	U	1	U	1.1	U
N	MAEPH	C11-C22 Aromatics	mg/kg	3.6	U	3.9	U	15		3.9	U
N	MAEPH	C11-C22 Aromatics (unadj.)	mg/kg	10	U	11	U	15		11	U
N	MAEPH	C19-C36 Aliphatics	mg/kg	10	U	11	U	20		11	U
N	MAEPH	C9-C18 Aliphatics	mg/kg	10	U	11	U	10	U	11	U
N	SW8270C	2-Methylnaphthalene	ug/kg								
N	SW8270C	Acenaphthene	ug/kg								
N	SW8270C	Acenaphthylene	ug/kg								
N	SW8270C	Anthracene	ug/kg								
N	SW8270C	Benzo(a)anthracene	ug/kg								
N	SW8270C	Benzo(a)pyrene	ug/kg								
N	SW8270C	Benzo(b)fluoranthene	ug/kg								
N	SW8270C	Benzo(ghi)perylene	ug/kg								
N	SW8270C	Benzo(k)fluoranthene	ug/kg								
N	SW8270C	Chrysene	ug/kg								
N	SW8270C	Dibenz(a,h)anthracene	ug/kg								
N	SW8270C	Fluoranthene	ug/kg								
N	SW8270C	Fluorene	ug/kg								
N	SW8270C	Indeno(1,2,3-cd)pyrene	ug/kg								
N	SW8270C	Naphthalene	ug/kg								
N	SW8270C	Phenanthrene	ug/kg								
N	SW8270C	Pyrene	ug/kg								

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/kg = milligram per kilogram

ug/kg = microgram per kilogram

Table 2.4
Final Results Summary - EPH
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-514		SB-514		SB-514		SB-515	
			Field Sample ID	OC-SB-514-0.0/1.0-XXX		OC-SB-514-15/17-XXX		OC-SB-514-7.0/9.0-XXX		OC-SB-515-13/15-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	MAEPH	2-Methylnaphthalene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Acenaphthene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Acenaphthylene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Anthracene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Benzo(a)anthracene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Benzo(a)pyrene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Benzo(b)fluoranthene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Benzo(ghi)perylene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Benzo(k)fluoranthene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Chrysene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Dibenz(a,h)anthracene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Fluoranthene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Fluorene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Indeno(1,2,3-cd)pyrene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Naphthalene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Phenanthrene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	Pyrene	mg/kg	1.3	U	1	U	1.2	U	1.1	U
N	MAEPH	C11-C22 Aromatics	mg/kg	4.3	U	3.6	U	4.2	U	4	U
N	MAEPH	C11-C22 Aromatics (unadj.)	mg/kg	13	U	10	U	12	U	11	U
N	MAEPH	C19-C36 Aliphatics	mg/kg	13	U	10	U	12	U	11	U
N	MAEPH	C9-C18 Aliphatics	mg/kg	13	U	10	U	12	U	11	U
N	SW8270C	2-Methylnaphthalene	ug/kg								
N	SW8270C	Acenaphthene	ug/kg								
N	SW8270C	Acenaphthylene	ug/kg								
N	SW8270C	Anthracene	ug/kg								
N	SW8270C	Benzo(a)anthracene	ug/kg								
N	SW8270C	Benzo(a)pyrene	ug/kg								
N	SW8270C	Benzo(b)fluoranthene	ug/kg								
N	SW8270C	Benzo(ghi)perylene	ug/kg								
N	SW8270C	Benzo(k)fluoranthene	ug/kg								
N	SW8270C	Chrysene	ug/kg								
N	SW8270C	Dibenz(a,h)anthracene	ug/kg								
N	SW8270C	Fluoranthene	ug/kg								
N	SW8270C	Fluorene	ug/kg								
N	SW8270C	Indeno(1,2,3-cd)pyrene	ug/kg								
N	SW8270C	Naphthalene	ug/kg								
N	SW8270C	Phenanthrene	ug/kg								
N	SW8270C	Pyrene	ug/kg								

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/kg = milligram per kilogram

ug/kg = microgram per kilogram

Table 2.4
Final Results Summary - EPH
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-515		SB-516		SB-516		SB-517	
			Field Sample ID	OC-SB-515-6.0/8.0-XXX		OC-SB-516-15/17-XXX		OC-SB-516-6.0/8.0-XXX		OC-SB-517-0.0/1.0-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	MAEPH	2-Methylnaphthalene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Acenaphthene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Acenaphthylene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Anthracene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Benzo(a)anthracene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Benzo(a)pyrene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Benzo(b)fluoranthene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Benzo(ghi)perylene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Benzo(k)fluoranthene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Chrysene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Dibenz(a,h)anthracene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Fluoranthene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Fluorene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Indeno(1,2,3-cd)pyrene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Naphthalene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Phenanthrene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	Pyrene	mg/kg	1.1	U	1.2	U	1.1	U	1	U
N	MAEPH	C11-C22 Aromatics	mg/kg	3.9	U	4.2	U	4	U	3.6	U
N	MAEPH	C11-C22 Aromatics (unadj.)	mg/kg	11	U	12	U	11	U	10	U
N	MAEPH	C19-C36 Aliphatics	mg/kg	11	U	12	U	11	U	10	U
N	MAEPH	C9-C18 Aliphatics	mg/kg	11	U	12	U	11	U	10	U
N	SW8270C	2-Methylnaphthalene	ug/kg								
N	SW8270C	Acenaphthene	ug/kg								
N	SW8270C	Acenaphthylene	ug/kg								
N	SW8270C	Anthracene	ug/kg								
N	SW8270C	Benzo(a)anthracene	ug/kg								
N	SW8270C	Benzo(a)pyrene	ug/kg								
N	SW8270C	Benzo(b)fluoranthene	ug/kg								
N	SW8270C	Benzo(ghi)perylene	ug/kg								
N	SW8270C	Benzo(k)fluoranthene	ug/kg								
N	SW8270C	Chrysene	ug/kg								
N	SW8270C	Dibenz(a,h)anthracene	ug/kg								
N	SW8270C	Fluoranthene	ug/kg								
N	SW8270C	Fluorene	ug/kg								
N	SW8270C	Indeno(1,2,3-cd)pyrene	ug/kg								
N	SW8270C	Naphthalene	ug/kg								
N	SW8270C	Phenanthrene	ug/kg								
N	SW8270C	Pyrene	ug/kg								

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/kg = milligram per kilogram

ug/kg = microgram per kilogram

Table 2.4
Final Results Summary - EPH
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-517		SB-517		SB-532		SB-532	
			Field Sample ID	OC-SB-517-18/20-XXX		OC-SB-517-6.0/8.0-XXX		OC-SB-532-0.0/1.0-XXX		OC-SB-532-11/13-XXX	
			Field Sample Date	12/12/12		12/12/12		12/13/12		12/13/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	MAEPH	2-Methylnaphthalene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Acenaphthene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Acenaphthylene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Anthracene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Benzo(a)anthracene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Benzo(a)pyrene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Benzo(b)fluoranthene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Benzo(ghi)perylene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Benzo(k)fluoranthene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Chrysene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Dibenz(a,h)anthracene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Fluoranthene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Fluorene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Indeno(1,2,3-cd)pyrene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Naphthalene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Phenanthrene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	Pyrene	mg/kg	1.3	U	1.1	U	1	U	1.3	U
N	MAEPH	C11-C22 Aromatics	mg/kg	4.2	U	3.7	U	28		4.4	U
N	MAEPH	C11-C22 Aromatics (unadj.)	mg/kg	13	U	11	U	28		13	U
N	MAEPH	C19-C36 Aliphatics	mg/kg	13	U	11	U	14		13	U
N	MAEPH	C9-C18 Aliphatics	mg/kg	13	U	11	U	10	U	13	U
N	SW8270C	2-Methylnaphthalene	ug/kg								
N	SW8270C	Acenaphthene	ug/kg								
N	SW8270C	Acenaphthylene	ug/kg								
N	SW8270C	Anthracene	ug/kg								
N	SW8270C	Benzo(a)anthracene	ug/kg								
N	SW8270C	Benzo(a)pyrene	ug/kg								
N	SW8270C	Benzo(b)fluoranthene	ug/kg								
N	SW8270C	Benzo(ghi)perylene	ug/kg								
N	SW8270C	Benzo(k)fluoranthene	ug/kg								
N	SW8270C	Chrysene	ug/kg								
N	SW8270C	Dibenz(a,h)anthracene	ug/kg								
N	SW8270C	Fluoranthene	ug/kg								
N	SW8270C	Fluorene	ug/kg								
N	SW8270C	Indeno(1,2,3-cd)pyrene	ug/kg								
N	SW8270C	Naphthalene	ug/kg								
N	SW8270C	Phenanthrene	ug/kg								
N	SW8270C	Pyrene	ug/kg								

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/kg = milligram per kilogram

ug/kg = microgram per kilogram

Table 2.4
Final Results Summary - EPH
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-532		SB-533		SB-533		SB-533	
			Field Sample ID	OC-SB-532-6.0/8.0-XXX		OC-SB-533-0.0/1.0-XXX		OC-SB-533-13/15-XXX		OC-SB-533-6.0/8.0-XXX	
			Field Sample Date	12/13/12		12/13/12		12/13/12		12/13/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30197-1		480-30197-1		480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	MAEPH	2-Methylnaphthalene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Acenaphthene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Acenaphthylene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Anthracene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Benzo(a)anthracene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Benzo(a)pyrene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Benzo(b)fluoranthene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Benzo(ghi)perylene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Benzo(k)fluoranthene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Chrysene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Dibenz(a,h)anthracene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Fluoranthene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Fluorene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Indeno(1,2,3-cd)pyrene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Naphthalene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Phenanthrene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	Pyrene	mg/kg	1.1	U	1	U	1.2	U		
N	MAEPH	C11-C22 Aromatics	mg/kg	3.9	U	3.5	U	4	U	120	
N	MAEPH	C11-C22 Aromatics (unadj.)	mg/kg	11	U	10	U	12	U	110	
N	MAEPH	C19-C36 Aliphatics	mg/kg	11	U	10	U	12	U	73	
N	MAEPH	C9-C18 Aliphatics	mg/kg	11	U	10	U	12	U	10	U
N	SW8270C	2-Methylnaphthalene	ug/kg							990	U
N	SW8270C	Acenaphthene	ug/kg							990	U
N	SW8270C	Acenaphthylene	ug/kg							990	U
N	SW8270C	Anthracene	ug/kg							990	U
N	SW8270C	Benzo(a)anthracene	ug/kg							990	U
N	SW8270C	Benzo(a)pyrene	ug/kg							990	U
N	SW8270C	Benzo(b)fluoranthene	ug/kg							990	U
N	SW8270C	Benzo(ghi)perylene	ug/kg							990	U
N	SW8270C	Benzo(k)fluoranthene	ug/kg							990	U
N	SW8270C	Chrysene	ug/kg							990	U
N	SW8270C	Dibenz(a,h)anthracene	ug/kg							990	U
N	SW8270C	Fluoranthene	ug/kg							990	U
N	SW8270C	Fluorene	ug/kg							990	U
N	SW8270C	Indeno(1,2,3-cd)pyrene	ug/kg							990	U
N	SW8270C	Naphthalene	ug/kg							990	U
N	SW8270C	Phenanthrene	ug/kg							990	U
N	SW8270C	Pyrene	ug/kg							990	U

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/kg = milligram per kilogram

ug/kg = microgram per kilogram

Table 2.4
Final Results Summary - EPH
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-534		SB-534	
			Field Sample ID	OC-SB-534-0.0/1.0-XXX		OC-SB-534-7.0/9.0-XXX	
			Field Sample Date	12/13/12		12/13/12	
			QC Code	FS		FS	
			Lab Sample Delivery Group	480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual
N	MAEPH	2-Methylnaphthalene	mg/kg	1.1	U	1	U
N	MAEPH	Acenaphthene	mg/kg	1.1	U	1	U
N	MAEPH	Acenaphthylene	mg/kg	1.1	U	1	U
N	MAEPH	Anthracene	mg/kg	1.1	U	1	U
N	MAEPH	Benzo(a)anthracene	mg/kg	1.1	U	1	U
N	MAEPH	Benzo(a)pyrene	mg/kg	1.1	U	1	U
N	MAEPH	Benzo(b)fluoranthene	mg/kg	1.1	U	1	U
N	MAEPH	Benzo(ghi)perylene	mg/kg	1.1	U	1	U
N	MAEPH	Benzo(k)fluoranthene	mg/kg	1.1	U	1	U
N	MAEPH	Chrysene	mg/kg	1.1	U	1	U
N	MAEPH	Dibenz(a,h)anthracene	mg/kg	1.1	U	1	U
N	MAEPH	Fluoranthene	mg/kg	1.1	U	1	U
N	MAEPH	Fluorene	mg/kg	1.1	U	1	U
N	MAEPH	Indeno(1,2,3-cd)pyrene	mg/kg	1.1	U	1	U
N	MAEPH	Naphthalene	mg/kg	1.1	U	1	U
N	MAEPH	Phenanthrene	mg/kg	1.1	U	1	U
N	MAEPH	Pyrene	mg/kg	1.1	U	1	U
N	MAEPH	C11-C22 Aromatics	mg/kg	31		3.6	U
N	MAEPH	C11-C22 Aromatics (unadj.)	mg/kg	31		10	U
N	MAEPH	C19-C36 Aliphatics	mg/kg	23		10	U
N	MAEPH	C9-C18 Aliphatics	mg/kg	11	U	10	U
N	SW8270C	2-Methylnaphthalene	ug/kg				
N	SW8270C	Acenaphthene	ug/kg				
N	SW8270C	Acenaphthylene	ug/kg				
N	SW8270C	Anthracene	ug/kg				
N	SW8270C	Benzo(a)anthracene	ug/kg				
N	SW8270C	Benzo(a)pyrene	ug/kg				
N	SW8270C	Benzo(b)fluoranthene	ug/kg				
N	SW8270C	Benzo(ghi)perylene	ug/kg				
N	SW8270C	Benzo(k)fluoranthene	ug/kg				
N	SW8270C	Chrysene	ug/kg				
N	SW8270C	Dibenz(a,h)anthracene	ug/kg				
N	SW8270C	Fluoranthene	ug/kg				
N	SW8270C	Fluorene	ug/kg				
N	SW8270C	Indeno(1,2,3-cd)pyrene	ug/kg				
N	SW8270C	Naphthalene	ug/kg				
N	SW8270C	Phenanthrene	ug/kg				
N	SW8270C	Pyrene	ug/kg				

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/kg = milligram per kilogram

ug/kg = microgram per kilogram

Prepared by / Date: KJC 02/18/13

Checked by / Date: TLC 02/19/13

Table 2.5
Final Results Summary - Tributyltin
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-528		SB-528		SB-528	
			Field Sample ID	OC-DUP-2		OC-SB-528-0.0/1.0-XXX		OC-SB-528-1.0/3.0-XXX	
			Field Sample Date	12/05/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS	
			Lab Sample Delivery Group	480-29598-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual
N	Organotins	TRIBUTYLTIN	ug/kg	3.2	U	R		3.7	U

Notes:

N = normal

FS = field sample

U = not detected, value is the reporting limit

R = value is rejected

ug/kg = microgram per kilogram

Prepared by / Date: KJC 02/18/13

Checked by / Date: TLC 02/19/13

Table 2.6
Final Results Summary - Metals
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-528		SB-528		SB-528	
			Field Sample ID	OC-DUP-2		OC-SB-528-0.0/1.0-XXX		OC-SB-528-1.0/3.0-XXX	
			Field Sample Date	12/05/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS	
			Lab Sample Delivery Group	480-29598-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual
T	SW6010	Tin	mg/kg	2.1	J	7.5	J	2.4	J

Notes:

T = Total (unfiltered)

FS = field sample

J = value is estimated

mg/Kg = milligram per kilogram

Prepared by / Date: KJC 02/18/13

Checked by / Date: TLC 02/19/13

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-503		SB-503		SB-503		SB-504		SB-504		SB-505	
			Field Sample ID	OC-SB-503-0.0/1.0-XXX		OC-SB-503-13/15-XXX		OC-SB-503-6.0/8.0-XXX		OC-SB-504-0.0/1.0-XXX		OC-SB-504-7.5/9.5-XXX		OC-SB-505-0.0/1.0-XXX	
			Field Sample Date	12/10/12		12/10/12		12/10/12		12/11/12		12/11/12		12/11/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29895-1		480-29895-1		480-29895-1		480-29976-1		480-29976-1		480-29976-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	2.9	U	2.3	U	2.5	U	0.29	J	0.26	UJ	0.34	J

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-505		SB-506		SB-506		SB-506		SB-507		SB-507	
			Field Sample ID	OC-SB-505-5.0/7.0-XXX		OC-SB-506-0.0/1.0-XXX		OC-SB-506-10/12-XXX		OC-SB-506-6.0/8.0-XXX		OC-SB-507-0.0/1.0-XXX		OC-SB-507-13/15-XXX	
			Field Sample Date	12/11/12		12/10/12		12/10/12		12/10/12		12/10/12		12/10/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29976-1		480-29895-1		480-29895-1		480-29895-1		480-29895-1		480-29895-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	0.58	J	11		0.23	U	0.23	U	1.3		4.1	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-507		SB-508		SB-508		SB-508		SB-509		SB-509	
			Field Sample ID	OC-SB-507-6.0/8.0-XXX		OC-SB-508-0.0/1.0-XXX		OC-SB-508-12/14-XXX		OC-SB-508-8.0/10-XXX		OC-SB-509-0.0/1.0-XXX		OC-SB-509-1.0/3.0-XXX	
			Field Sample Date	12/10/12		12/11/12		12/11/12		12/11/12		12/14/12		12/13/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29895-1		480-29976-1		480-29976-1		480-29976-1		480-30346-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	0.25	U	3	UJ	0.26	J	1.1	J	27	UJ	28	J

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-510		SB-510		SB-511		SB-511		SB-511		SB-512	
			Field Sample ID	OC-SB-510-0.0/1.0-XXX		OC-SB-510-7.0/9.0-XXX		OC-SB-511-0.0/1.0-XXX		OC-SB-511-11/13-XXX		OC-SB-511-6.0/8.0-XXX		OC-SB-512-0.0/1.0-XXX	
			Field Sample Date	12/13/12		12/13/12		12/10/12		12/10/12		12/10/12		12/10/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30197-1		480-30197-1		480-29895-1		480-29895-1		480-29895-1		480-29895-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	10	J	6	J	0.45		2.3		0.5		6.2	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-512		SB-512		SB-513		SB-513		SB-513		SB-514	
			Field Sample ID	OC-SB-512-13/15-XXX		OC-SB-512-6.0/8.0-XXX		OC-SB-513-0.0/1.0-XXX		OC-SB-513-10/12-XXX		OC-SB-513-7.0/9.0-XXX		OC-DUP-4	
			Field Sample Date	12/10/12		12/10/12		12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29895-1		480-29895-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	1.4		0.87		0.23	UJ	0.47	J	1	J	0.18	J

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-514		SB-514		SB-514		SB-517		SB-517		SB-517	
			Field Sample ID	OC-SB-514-0.0/1.0-XXX		OC-SB-514-15/17-XXX		OC-SB-514-7.0/9.0-XXX		OC-SB-517-0.0/1.0-XXX		OC-SB-517-18/20-XXX		OC-SB-517-6.0/8.0-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	0.54	J	0.88	J	0.21	J	1.2	J	8	J	0.32	J

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-518		SB-518		SB-518		SB-519		SB-519		SB-519	
			Field Sample ID	OC-SB-518-0.0/1.0-XXX		OC-SB-518-13/15-XXX		OC-SB-518-8.0/10-XXX		OC-SB-519-0.0/1.0-XXX		OC-SB-519-12/14-XXX		OC-SB-519-8.0/10-XXX	
			Field Sample Date	12/14/12		12/14/12		12/14/12		12/14/12		12/14/12		12/14/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30346-1		480-30346-1		480-30346-1		480-30346-1		480-30346-1		480-30346-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	28	UJ	36	J	0.25	UJ	30	UJ	2.2	J	0.29	J

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-521		SB-521		SB-521		SB-522		SB-522		SB-522	
			Field Sample ID	OC-SB-521-0.0/1.0-XXX		OC-SB-521-16/18-XXX		OC-SB-521-8.0/10-XXX		OC-SB-522-0.0/1.0-XXX		OC-SB-522-13/15-XXX		OC-SB-522-8.0/10-XXX	
			Field Sample Date	12/14/12		12/14/12		12/14/12		12/13/12		12/13/12		12/13/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30346-1		480-30346-1		480-30346-1		480-30197-1		480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg		R	48	J	0.27	J	0.25	UJ	0.2	J	1.6	J

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-523		SB-523		SB-523		SB-524		SB-524		SB-524	
			Field Sample ID	OC-SB-523-0.0/1.0-XXX		OC-SB-523-22/24-XXX		OC-SB-523-6.0/8.0-XXX		OC-SB-524-0.0/1.0-XXX		OC-SB-524-27/29-XXX		OC-SB-524-8.0/10-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	0.39	J	1.1	J	0.17	J	0.31	J	0.25	UJ	0.34	J

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-525		SB-525		SB-525		SB-526		SB-526		SB-527	
			Field Sample ID	OC-SB-525-0.0/1.0-XXX		OC-SB-525-18/20-XXX		OC-SB-525-3.0/5.0-XXX		OC-SB-526-0.0/1.0-XXX		OC-SB-526-1.0/3.0-XXX		OC-SB-527-0.0/1.0-XXX	
			Field Sample Date	12/13/12		12/13/12		12/13/12		12/05/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30197-1		480-30197-1		480-30197-1		480-29598-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	0.52	J	9.7	J	0.24	UJ	3.4	U	2.7	U	2.9	U

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-527		SB-528		SB-528		SB-529		SB-529		SS-510	
			Field Sample ID	OC-SB-527-1.0/3.0-XXX		OC-SB-528-0.0/1.0-XXX		OC-SB-528-1.0/3.0-XXX		OC-SB-529-0.0/1.0-XXX		OC-SB-529-1.0/3.0-XXX		OC-SS-510-0.0/1.0-XXX	
			Field Sample Date	12/05/12		12/05/12		12/05/12		12/05/12		12/05/12		12/04/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29598-1		480-29598-1		480-29598-1		480-29598-1		480-29598-1		480-29484-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	2.9	U	19	J	4	J	3.3	U	2.4	U	2.6	U

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SS-511		SS-512		SS-513		SS-514		SS-515		SS-516	
			Field Sample ID	OC-SS-511-0.0/1.0-XXX		OC-SS-512-0.0/1.0-XXX		OC-SS-513-0.0/1.0-XXX		OC-SS-514-0.0/1.0-XXX		OC-SS-515-0.0/1.0-XXX		OC-SS-516-0.0/1.0-XXX	
			Field Sample Date	12/04/12		12/04/12		12/04/12		12/04/12		12/04/12		12/04/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29484-1		480-29484-1		480-29484-1		480-29484-1		480-29484-1		480-29484-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	3.8	U	2.9	U	3.5	U	2.2	U	2.5	U	2.4	U

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SS-517		SS-518		SS-519		SS-520		SS-521		SS-521	
			Field Sample ID	OC-SS-517-0.0/1.0-XXX		OC-SS-518-0.0/1.0-XXX		OC-SS-519-0.0/1.0-XXX		OC-SS-520-0.0/1.0-XXX		OC-DUP-1		OC-SS-521-0.0/1.0-XXX	
			Field Sample Date	12/04/12		12/04/12		12/04/12		12/04/12		12/04/12		12/04/12	
			QC Code	FS		FS		FS		FS		FD		FS	
			Lab Sample Delivery Group	480-29484-1		480-29484-1		480-29484-1		480-29484-1		480-29484-1		480-29484-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	2.4	U	3.9	U	4	U	4.7	U	3.4	U	4.9	U

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
mg/Kg = milligram per kilogram

Table 2.7
Final Results Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SS-522		SS-523		SS-524		SS-525	
			Field Sample ID	OC-SS-522-0.0/1.0-XXX		OC-SS-523-0.0/1.0-XXX		OC-SS-524-0.0/1.0-XXX		OC-SS-525-0.0/1.0-XXX	
			Field Sample Date	12/04/12		12/04/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29484-1		480-29484-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	SW7199	Chromium, Hexavalent	mg/kg	3.2	U	3.5	U	4.4	U	3	U

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mg/Kg = milligram per kilogram

Prepared by / Date: KJC 02/18/13

Checked by / Date: TLC 02/19/13

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-480		SB-484		SB-486		SB-491		SB-491		SB-503		SB-503	
			Field Sample ID	OC-SB-480-6.0/8.0-XXX		OC-SB-484-5.5/7.5-XXX		OC-SB-486-8.0/10-XXX		OC-DUP-3		OC-SB-491-6.0/8.0-XXX		OC-SB-503-0.0/1.0-XXX		OC-SB-503-13/15-XXX	
			Field Sample Date	12/11/12		12/11/12		12/11/12		12/11/12		12/11/12		12/10/12		12/10/12	
			QC Code	FS		FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29976-1		480-29976-1		480-29976-1		480-29976-1		480-29976-1		480-29895-1		480-29895-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV											91		24	
N	SW9045C	pH	pH units											5.04		6.44	
N	E160.3	Percent Moisture	percent	6.8		12		8.8		5.3		4.5		29		16	
N	E160.3	Percent Solids	percent	93		88		91		95		96		71		84	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-503		SB-504		SB-504		SB-505		SB-505		SB-506	
			Field Sample ID	OC-SB-503-6.0/8.0-XXX		OC-SB-504-0.0/1.0-XXX		OC-SB-504-7.5/9.5-XXX		OC-SB-505-0.0/1.0-XXX		OC-SB-505-5.0/7.0-XXX		OC-SB-506-0.0/1.0-XXX	
			Field Sample Date	12/10/12		12/11/12		12/11/12		12/11/12		12/11/12		12/10/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29895-1		480-29976-1		480-29976-1		480-29976-1		480-29976-1		480-29895-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	47		36		26		49		19		40	
N	SW9045C	pH	pH units	6.01		7.18		7.11		4.99		6.54		5.34	
N	E160.3	Percent Moisture	percent	19		27		23		4.8		27		15	
N	E160.3	Percent Solids	percent	81		73		77		95		73		85	

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-506		SB-506		SB-507		SB-507		SB-507		SB-508	
			Field Sample ID	OC-SB-506-10/12-XXX		OC-SB-506-6.0/8.0-XXX		OC-SB-507-0.0/1.0-XXX		OC-SB-507-13/15-XXX		OC-SB-507-6.0/8.0-XXX		OC-SB-508-0.0/1.0-XXX	
			Field Sample Date	12/10/12		12/10/12		12/10/12		12/10/12		12/10/12		12/11/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29895-1		480-29895-1		480-29895-1		480-29895-1		480-29895-1		480-29976-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	14		18		23		6		15		30	
N	SW9045C	pH	pH units	6.41		6.07		6.12		6.44		6.16		5.51	
N	E160.3	Percent Moisture	percent	14		14		7.1		16		7.8		33	
N	E160.3	Percent Solids	percent	86		86		93		84		92		67	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-508		SB-508		SB-509		SB-509		SB-510		SB-510	
			Field Sample ID	OC-SB-508-12/14-XXX		OC-SB-508-8.0/10-XXX		OC-SB-509-0.0/1.0-XXX		OC-SB-509-1.0/3.0-XXX		OC-SB-510-0.0/1.0-XXX		OC-SB-510-7.0/9.0-XXX	
			Field Sample Date	12/11/12		12/11/12		12/14/12		12/13/12		12/13/12		12/13/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29976-1		480-29976-1		480-30346-1		480-30197-1		480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	13		19		9		18		83		55	
N	SW9045C	pH	pH units	7.44		5.69		5.88		6.85		5.36		6.88	
N	E160.3	Percent Moisture	percent	18		19		25		20		7.9		14	
N	E160.3	Percent Solids	percent	82		81		75		80		92		86	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-511		SB-511		SB-511		SB-512		SB-512		SB-512	
			Field Sample ID	OC-SB-511-0.0/1.0-XXX		OC-SB-511-11/13-XXX		OC-SB-511-6.0/8.0-XXX		OC-SB-512-0.0/1.0-XXX		OC-SB-512-13/15-XXX		OC-SB-512-6.0/8.0-XXX	
			Field Sample Date	12/10/12		12/10/12		12/10/12		12/10/12		12/10/12		12/10/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29895-1		480-29895-1		480-29895-1		480-29895-1		480-29895-1		480-29895-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	19		12		31		23		16		26	
N	SW9045C	pH	pH units	6.05		7.36		5.91		5.7		6.65		5.65	
N	E160.3	Percent Moisture	percent	25		16		23		23		15		19	
N	E160.3	Percent Solids	percent	75		84		77		77		85		81	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-513		SB-513		SB-513		SB-514		SB-514		SB-514		SB-514	
			Field Sample ID	OC-SB-513-0.0/1.0-XXX		OC-SB-513-10/12-XXX		OC-SB-513-7.0/9.0-XXX		OC-DUP-4		OC-SB-514-0.0/1.0-XXX		OC-SB-514-15/17-XXX		OC-SB-514-7.0/9.0-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	45		20		32		32		57		14		27	
N	SW9045C	pH	pH units	7.3		7.08		6.13		5.49		4.72		6.85		5.21	
N	E160.3	Percent Moisture	percent	13		15		15		16		23		8		22	
N	E160.3	Percent Solids	percent	87		85		85		84		77		92		78	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-515		SB-515		SB-516		SB-516		SB-517		SB-517	
			Field Sample ID	OC-SB-515-13/15-XXX		OC-SB-515-6.0/8.0-XXX		OC-SB-516-15/17-XXX		OC-SB-516-6.0/8.0-XXX		OC-SB-517-0.0/1.0-XXX		OC-SB-517-18/20-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV									42		5	
N	SW9045C	pH	pH units									4.82		6.36	
N	E160.3	Percent Moisture	percent	17		15		22		17		9		22	
N	E160.3	Percent Solids	percent	83		85		78		83		91		78	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-517		SB-518		SB-518		SB-518		SB-519		SB-519	
			Field Sample ID	OC-SB-517-6.0/8.0-XXX		OC-SB-518-0.0/1.0-XXX		OC-SB-518-13/15-XXX		OC-SB-518-8.0/10-XXX		OC-SB-519-0.0/1.0-XXX		OC-SB-519-12/14-XXX	
			Field Sample Date	12/12/12		12/14/12		12/14/12		12/14/12		12/14/12		12/14/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30346-1		480-30346-1		480-30346-1		480-30346-1		480-30346-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	20		10		7		15		17		15	
N	SW9045C	pH	pH units	5.56		6.47		6.52		6.77		5.94		6.58	
N	E160.3	Percent Moisture	percent	9.9		29		20		21		34		22	
N	E160.3	Percent Solids	percent	90		71		80		79		66		78	

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-519		SB-520		SB-520		SB-520		SB-521		SB-521	
			Field Sample ID	OC-SB-519-8.0/10-XXX		OC-SB-520-0.0/1.0-XXX		OC-SB-520-18/20-XXX		OC-SB-520-8.0/10-XXX		OC-SB-521-0.0/1.0-XXX		OC-SB-521-16/18-XXX	
			Field Sample Date	12/14/12		12/13/12		12/13/12		12/13/12		12/14/12		12/14/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30346-1		480-30197-1		480-30197-1		480-30197-1		480-30346-1		480-30346-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	14								84		34	
N	SW9045C	pH	pH units	7.18								3.8		5.82	
N	E160.3	Percent Moisture	percent	24		16		7.4		6.1		82		18	
N	E160.3	Percent Solids	percent	76		84		93		94		18		82	

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-521		SB-522		SB-522		SB-522		SB-523		SB-523	
			Field Sample ID	OC-SB-521-8.0/10-XXX		OC-SB-522-0.0/1.0-XXX		OC-SB-522-13/15-XXX		OC-SB-522-8.0/10-XXX		OC-SB-523-0.0/1.0-XXX		OC-SB-523-22/24-XXX	
			Field Sample Date	12/14/12		12/13/12		12/13/12		12/13/12		12/12/12		12/12/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30346-1		480-30197-1		480-30197-1		480-30197-1		480-30106-1		480-30106-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	42		31		10		10		14		30	
N	SW9045C	pH	pH units	5.52		6.6		6.59		6.61		6.55		6.49	
N	E160.3	Percent Moisture	percent	20		19		18		18		16		10	
N	E160.3	Percent Solids	percent	80		81		82		82		84		90	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-523		SB-524		SB-524		SB-524		SB-525		SB-525	
			Field Sample ID	OC-SB-523-6.0/8.0-XXX		OC-SB-524-0.0/1.0-XXX		OC-SB-524-27/29-XXX		OC-SB-524-8.0/10-XXX		OC-SB-525-0.0/1.0-XXX		OC-SB-525-18/20-XXX	
			Field Sample Date	12/12/12		12/12/12		12/12/12		12/12/12		12/13/12		12/13/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30106-1		480-30106-1		480-30106-1		480-30106-1		480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	21		7		10		14		14		6	
N	SW9045C	pH	pH units	6.17		7.37		6.89		6.78		6.96		7.21	
N	E160.3	Percent Moisture	percent	11		17		22		17		10		8.1	
N	E160.3	Percent Solids	percent	89		83		78		83		90		92	

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-525		SB-526		SB-526		SB-527		SB-527		SB-528		SB-528	
			Field Sample ID	OC-SB-525-3.0/5.0-XXX		OC-SB-526-0.0/1.0-XXX		OC-SB-526-1.0/3.0-XXX		OC-SB-527-0.0/1.0-XXX		OC-SB-527-1.0/3.0-XXX		OC-DUP-2		OC-SB-528-0.0/1.0-XXX	
			Field Sample Date	12/13/12		12/05/12		12/05/12		12/05/12		12/05/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30197-1		480-29598-1		480-29598-1		480-29598-1		480-29598-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	2		75		82		79		73				0.01	U
N	SW9045C	pH	pH units	7.07		4.04		4.33		3.73		3.85				6.02	
N	E160.3	Percent Moisture	percent	16		42		25		30		32		54		73	
N	E160.3	Percent Solids	percent	84		58		75		70		68		46		27	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-528		SB-529		SB-529		SB-532		SB-532		SB-532	
			Field Sample ID	OC-SB-528-1.0/3.0-XXX		OC-SB-529-0.0/1.0-XXX		OC-SB-529-1.0/3.0-XXX		OC-SB-532-0.0/1.0-XXX		OC-SB-532-11/13-XXX		OC-SB-532-6.0/8.0-XXX	
			Field Sample Date	12/05/12		12/05/12		12/05/12		12/13/12		12/13/12		12/13/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29598-1		480-29598-1		480-29598-1		480-30197-1		480-30197-1		480-30197-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	0.01	U	49		34							
N	SW9045C	pH	pH units	6.15		3.88		4.24							
N	E160.3	Percent Moisture	percent	59		41		21		6.3		25		15	
N	E160.3	Percent Solids	percent	41		59		79		94		75		85	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SB-533		SB-533		SB-533		SB-534		SB-534		SS-510	
			Field Sample ID	OC-SB-533-0.0/1.0-XXX		OC-SB-533-13/15-XXX		OC-SB-533-6.0/8.0-XXX		OC-SB-534-0.0/1.0-XXX		OC-SB-534-7.0/9.0-XXX		OC-SS-510-0.0/1.0-XXX	
			Field Sample Date	12/13/12		12/13/12		12/13/12		12/13/12		12/13/12		12/04/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-30197-1		480-30197-1		480-30197-1		480-30197-1		480-30197-1		480-29484-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV											120	
N	SW9045C	pH	pH units											4.24	
N	E160.3	Percent Moisture	percent	5.6		17		4.6		6.6		7.8		24	
N	E160.3	Percent Solids	percent	94		83		95		93		92		76	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SS-511		SS-512		SS-513		SS-514		SS-515		SS-516	
			Field Sample ID	OC-SS-511-0.0/1.0-XXX		OC-SS-512-0.0/1.0-XXX		OC-SS-513-0.0/1.0-XXX		OC-SS-514-0.0/1.0-XXX		OC-SS-515-0.0/1.0-XXX		OC-SS-516-0.0/1.0-XXX	
			Field Sample Date	12/04/12		12/04/12		12/04/12		12/04/12		12/04/12		12/04/12	
			QC Code	FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	480-29484-1		480-29484-1		480-29484-1		480-29484-1		480-29484-1		480-29484-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	25		100		20		61		57		68	
N	SW9045C	pH	pH units	6.49		4.21		6.28		4.59		4.55		3.59	
N	E160.3	Percent Moisture	percent	46		30		42		8.7		18		17	
N	E160.3	Percent Solids	percent	54		70		58		91		82		83	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SS-517		SS-518		SS-519		SS-520		SS-521		SS-521		SS-522	
			Field Sample ID	OC-SS-517-0.0/1.0-XXX		OC-SS-518-0.0/1.0-XXX		OC-SS-519-0.0/1.0-XXX		OC-SS-520-0.0/1.0-XXX		OC-DUP-1		OC-SS-521-0.0/1.0-XXX		OC-SS-522-0.0/1.0-XXX	
			Field Sample Date	12/04/12		12/04/12		12/04/12		12/04/12		12/04/12		12/04/12		12/04/12	
			QC Code	FS		FS		FS		FS		FD		FS		FS	
			Lab Sample Delivery Group	480-29484-1		480-29484-1		480-29484-1		480-29484-1		480-29484-1		480-29484-1		480-29484-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	64		68		97		98		62		67		67	
N	SW9045C	pH	pH units	3.82		3.64		3.58		3.99		3.69		3.87		3.9	
N	E160.3	Percent Moisture	percent	18		50		52		59		42		59		36	
N	E160.3	Percent Solids	percent	82		50		48		41		58		41		64	

Notes:
N = normal
FS = field sample
FD = field duplicate
U = not detected, value is the reporting limit
J = value is estimated
mV = millivolts

Table 2.8
Final Results Summary - General Chemistry
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	SS-523		SS-524		SS-525	
			Field Sample ID	OC-SS-523-0.0/1.0-XXX		OC-SS-524-0.0/1.0-XXX		OC-SS-525-0.0/1.0-XXX	
			Field Sample Date	12/04/12		12/05/12		12/05/12	
			QC Code	FS		FS		FS	
			Lab Sample Delivery Group	480-29484-1		480-29598-1		480-29598-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual
N	A2580B	Oxidation Reduction Potential	mV	82		110		99	
N	SW9045C	pH	pH units	3.71		3.36		4.07	
N	E160.3	Percent Moisture	percent	42		55		34	
N	E160.3	Percent Solids	percent	58		45		66	

Notes:

N = normal

FS = field sample

FD = field duplicate

U = not detected, value is the reporting limit

J = value is estimated

mV = millivolts

Prepared by / Date: KJC 02/18/13

Checked by / Date: TLC 02/19/13

Table 3.2
Data Validation Action Summary - VOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
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
480-29976-1	480-29976-5	SW8260C	OC-SB-480-6.0/8.0-XXX	2,4,4-Trimethyl-1-pentene	4.9	U	4.9	UJ	CCV%D	ug/kg
480-29976-1	480-29976-6	SW8260C	OC-SB-484-5.5/7.5-XXX	2,4,4-Trimethyl-1-pentene	1.6	J	1.6	J	CCV%D	ug/kg
480-29976-1	480-29976-7	SW8260C	OC-SB-486-8.0/10-XXX	2,4,4-Trimethyl-1-pentene	3700	*	3700	J	CCV%D	ug/kg
480-29976-1	480-29976-7	SW8260C	OC-SB-486-8.0/10-XXX	2,4,4-Trimethyl-2-pentene	850	*	850	J	LCS-H	ug/kg
480-29976-1	480-29976-8	SW8260C	OC-SB-491-6.0/8.0-XXX	2,4,4-Trimethyl-1-pentene	4.9	U	4.9	UJ	CCV%D	ug/kg
480-29976-1	480-29976-9	SW8260C	OC-DUP-3	2,4,4-Trimethyl-1-pentene	4.9	U	4.9	UJ	CCV%D	ug/kg
480-30197-1	480-30197-4	SW8260C	OC-SB-520-0.0/1.0-XXX	2,4,4-Trimethyl-1-pentene	4.8	U	4.8	UJ	CCV%D	ug/kg
480-30197-1	480-30197-5	SW8260C	OC-SB-520-8.0/10-XXX	2,4,4-Trimethyl-1-pentene	4.8	U	4.8	UJ	CCV%D	ug/kg

Units:
ug/kg = microgram per kilogram

Validation Reason Codes:
CCV%D = Continuing calibration %D
LCS-L = LCS recovery low

Prepared by / Date: KJC 02/18/13
Checked by / Date: TLC 02/19/13

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

Table 3.3
Data Validation Action Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
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
480-29598-1	480-29598-10	SW8270	OC-SB-529-1.0/3.0-XXX	4-Nitrophenol	210	U *		R	LCS-L	ug/kg
480-29598-1	480-29598-10	SW8270	OC-SB-529-1.0/3.0-XXX	Benzoic Acid	210	U		R	LCS-L	ug/kg
480-29598-1	480-29598-10	SW8270	OC-SB-529-1.0/3.0-XXX	Benzyl alcohol	84	U		R	LCS-L	ug/kg
480-29598-1	480-29598-3	SW8270	OC-SB-526-0.0/1.0-XXX	4-Nitrophenol	280	U *		R	LCS-L	ug/kg
480-29598-1	480-29598-3	SW8270	OC-SB-526-0.0/1.0-XXX	Benzoic Acid	280	U		R	LCS-L	ug/kg
480-29598-1	480-29598-3	SW8270	OC-SB-526-0.0/1.0-XXX	Benzyl alcohol	110	U		R	LCS-L	ug/kg
480-29598-1	480-29598-4	SW8270	OC-SB-526-1.0/3.0-XXX	4-Nitrophenol	220	U *		R	LCS-L	ug/kg
480-29598-1	480-29598-4	SW8270	OC-SB-526-1.0/3.0-XXX	Benzoic Acid	220	U		R	LCS-L	ug/kg
480-29598-1	480-29598-4	SW8270	OC-SB-526-1.0/3.0-XXX	Benzyl alcohol	88	U		R	LCS-L	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	1,2,4,5-Tetrachlorobenzene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	1,2,4-Trichlorobenzene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	1,2-Dichlorobenzene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	1,3-Dichlorobenzene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	1,4-Dichlorobenzene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	1-Methylnaphthalene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2,3,4,6-Tetrachlorophenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2,4,5-Trichlorophenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2,4,6-Trichlorophenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2,4-Dichlorophenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2,4-Dimethylphenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2,4-Dinitrophenol	2400	U *		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2,4-Dinitrotoluene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2,6-Dinitrotoluene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2-Chloronaphthalene	2400	U *		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2-Chlorophenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2-Methylnaphthalene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2-Methylphenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2-Nitroaniline	12000	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	2-Nitrophenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	3 & 4 Methylphenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	3,3'-Dichlorobenzidine	4800	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	3-Nitroaniline	12000	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	4,6-Dinitro-2-methylphenol	12000	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	4-Bromophenyl phenyl ether	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	4-Chloro-3-methylphenol	4800	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	4-Chloroaniline	4800	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	4-Chlorophenyl phenyl ether	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	4-Methylphenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	4-Nitroaniline	12000	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	4-Nitrophenol	12000	U *		R	LCS-L, PM	ug/kg

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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
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Acenaphthene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Acenaphthylene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Acetophenone	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Aniline	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Anthracene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Atrazine	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Azobenzene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Benzaldehyde	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Benzo(a)anthracene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Benzo(a)pyrene	2400	U		R	PM, IS-H	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Benzo(b)fluoranthene	2400	U		R	PM, IS-H	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Benzo(ghi)perylene	2400	U		R	PM, IS-H	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Benzo(k)fluoranthene	2400	U		R	PM, IS-H	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Benzoic Acid	12000	U		R	LCS-L, PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Benzyl alcohol	4800	U		R	LCS-L, PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Biphenyl	930	J	930	J	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Bis(2-Chloroethoxy)methane	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Bis(2-Chloroethyl)ether	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Bis(2-Chloroisopropyl)ether	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Bis(2-Ethylhexyl)phthalate	41000		41000	J	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Butylbenzylphthalate	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Caprolactam	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Carbazole	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Chrysene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Dibenz(a,h)anthracene	2400	U		R	PM, IS-H	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Dibenzofuran	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Diethylphthalate	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Dimethylphthalate	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Di-n-butylphthalate	12000	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Di-n-octylphthalate	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Diphenyl ether	1900	J	1900	J	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Diphenylmethanone	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Fluoranthene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Fluorene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Hexachlorobenzene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Hexachlorobutadiene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Hexachlorocyclopentadiene	4800	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Hexachloroethane	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Indeno(1,2,3-cd)pyrene	2400	U *		R	PM, IS-H	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Isophorone	2400	U		R	PM	ug/kg

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480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Naphthalene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Nitrobenzene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	N-Nitrosodimethylamine	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	N-Nitrosodi-n-propylamine	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	N-Nitrosodiphenylamine	1300	J	1300	J	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Pentachlorophenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Phenanthrene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Phenol	2400	U		R	PM	ug/kg
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	Pyrene	2400	U		R	PM	ug/kg
480-29598-1	480-29598-8	SW8270	OC-SB-528-1.0/3.0-XXX	4-Nitrophenol	7900	U *		R	LCS-L	ug/kg
480-29598-1	480-29598-8	SW8270	OC-SB-528-1.0/3.0-XXX	Benzoic Acid	7900	U		R	LCS-L	ug/kg
480-29598-1	480-29598-8	SW8270	OC-SB-528-1.0/3.0-XXX	Benzyl alcohol	3200	U		R	LCS-L	ug/kg
480-29598-1	480-29598-9	SW8270	OC-SB-529-0.0/1.0-XXX	4-Nitrophenol	280	U *		R	LCS-L	ug/kg
480-29598-1	480-29598-9	SW8270	OC-SB-529-0.0/1.0-XXX	Benzoic Acid	280	U		R	LCS-L	ug/kg
480-29598-1	480-29598-9	SW8270	OC-SB-529-0.0/1.0-XXX	Benzyl alcohol	110	U		R	LCS-L	ug/kg
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	2,4-Dimethylphenol	40	U *	40	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	2,4-Dinitrophenol	40	U *		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	2,6-Dinitrotoluene	40	U *	40	UJ	LCS-L	ug/kg
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	2-Nitrophenol	40	U *	40	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	4-Chloroaniline	79	U *	79	UJ	LCS-L	ug/kg
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	4-Methylphenol	40	U	40	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	4-Nitrophenol	200	U *		R	LCS-L	ug/kg
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	Benzoic Acid	200	U	200	UJ	CCV%D	ug/kg
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	Benzyl alcohol	79	U		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	N-Nitrosodimethylamine	40	U	40	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	2,4-Dimethylphenol	42	U *	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	2,4-Dinitrophenol	42	U *		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	2,6-Dinitrotoluene	42	U *	42	UJ	LCS-L	ug/kg
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	2-Nitrophenol	42	U *	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	4-Chloro-3-methylphenol	72	U	72	UJ	MS-L	ug/kg
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	4-Chloroaniline	85	U *	85	UJ	LCS-L	ug/kg
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	4-Methylphenol	42	U	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	4-Nitrophenol	210	U *		R	LCS-L	ug/kg
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	Benzoic Acid	210	U	210	UJ	CCV%D	ug/kg
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	Benzyl alcohol	85	U		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	N-Nitrosodimethylamine	42	U	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	N-Nitrosodiphenylamine	36	U	36	UJ	MS-L	ug/kg
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	2,4-Dimethylphenol	36	U *	36	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	2,4-Dinitrophenol	36	U *		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	2,6-Dinitrotoluene	36	U *	36	UJ	LCS-L	ug/kg

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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
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	2-Nitrophenol	36	U *	36	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	4-Chloroaniline	72	U *	72	UJ	LCS-L	ug/kg
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	4-Methylphenol	36	U	36	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	4-Nitrophenol	180	U *		R	LCS-L	ug/kg
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	Benzoic Acid	180	U	180	UJ	CCV%D	ug/kg
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	Benzyl alcohol	72	U		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	N-Nitrosodimethylamine	36	U	36	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	2,4-Dimethylphenol	37	U *	37	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	2,4-Dinitrophenol	37	U *		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	2,6-Dinitrotoluene	37	U *	37	UJ	LCS-L	ug/kg
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	2-Nitrophenol	37	U *	37	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	4-Chloroaniline	74	U *	74	UJ	LCS-L	ug/kg
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	4-Methylphenol	37	U	37	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	4-Nitrophenol	180	U *		R	LCS-L	ug/kg
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	Benzoic Acid	180	U	180	UJ	CCV%D	ug/kg
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	Benzyl alcohol	74	U		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	N-Nitrosodimethylamine	37	U	37	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	2,4-Dimethylphenol	42	U *	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	2,4-Dinitrophenol	42	U *		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	2,6-Dinitrotoluene	42	U *	42	UJ	LCS-L	ug/kg
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	2-Nitrophenol	42	U *	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	4-Chloroaniline	85	U *	85	UJ	LCS-L	ug/kg
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	4-Methylphenol	42	U	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	4-Nitrophenol	210	U *		R	LCS-L	ug/kg
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	Benzoic Acid	210	U	210	UJ	CCV%D	ug/kg
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	Benzyl alcohol	85	U		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	N-Nitrosodimethylamine	42	U	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-4	SW8270	OC-SB-514-0.0/1.0-XXX	2,4-Dinitrophenol	43	U *	43	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-4	SW8270	OC-SB-514-0.0/1.0-XXX	4-Nitroaniline	220	U	220	UJ	LCS-L	ug/kg
480-30106-1	480-30106-4	SW8270	OC-SB-514-0.0/1.0-XXX	4-Nitrophenol	220	U *	220	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	2,4-Dimethylphenol	42	U *	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	2,4-Dinitrophenol	42	U *		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	2,6-Dinitrotoluene	42	U *	42	UJ	LCS-L	ug/kg
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	2-Nitrophenol	42	U *	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	4-Chloroaniline	84	U *	84	UJ	LCS-L	ug/kg
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	4-Methylphenol	42	U	42	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	4-Nitrophenol	210	U *		R	LCS-L	ug/kg
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	Benzoic Acid	210	U	210	UJ	CCV%D	ug/kg
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	Benzyl alcohol	84	U		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	N-Nitrosodimethylamine	42	U	42	UJ	LCS-RPD	ug/kg

Table 3.3
Data Validation Action Summary - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
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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
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	2,4-Dimethylphenol	36	U *	36	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	2,4-Dinitrophenol	36	U *		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	2,6-Dinitrotoluene	36	U *	36	UJ	LCS-L	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	2-Nitrophenol	36	U *	36	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	4-Chloroaniline	72	U *	72	UJ	LCS-L	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	4-Methylphenol	36	U	36	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	4-Nitrophenol	180	U *		R	LCS-L	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	Benzoic Acid	180	U	180	UJ	CCV%D	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	Benzyl alcohol	72	U		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	N-Nitrosodimethylamine	36	U	36	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	2,4-Dimethylphenol	39	U *	39	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	2,4-Dinitrophenol	39	U *		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	2,6-Dinitrotoluene	39	U *	39	UJ	LCS-L	ug/kg
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	2-Nitrophenol	39	U *	39	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	4-Chloroaniline	78	U *	78	UJ	LCS-L	ug/kg
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	4-Methylphenol	39	U	39	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	4-Nitrophenol	200	U *		R	LCS-L	ug/kg
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	Benzoic Acid	200	U	200	UJ	CCV%D	ug/kg
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	Benzyl alcohol	78	U		R	LCS-L, LCS-RPD	ug/kg
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	N-Nitrosodimethylamine	39	U	39	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-9	SW8270	OC-SB-515-13/15-XXX	2,4-Dinitrophenol	39	U *	39	UJ	LCS-RPD	ug/kg
480-30106-1	480-30106-9	SW8270	OC-SB-515-13/15-XXX	4-Nitroaniline	190	U	190	UJ	LCS-L	ug/kg
480-30106-1	480-30106-9	SW8270	OC-SB-515-13/15-XXX	4-Nitrophenol	190	U *	190	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	2,4-Dimethylphenol	39	U *	39	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	2,4-Dinitrophenol	39	U *		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	2,6-Dinitrotoluene	39	U *	39	UJ	LCS-L	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	2-Nitrophenol	39	U *	39	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	4-Chloroaniline	79	U *	79	UJ	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	4-Methylphenol	39	U	39	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	4-Nitrophenol	200	U *		R	LCS-L	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	Benzyl alcohol	79	U		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	Fluoranthene	860	E	860	J	E	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	N-Nitrosodimethylamine	39	U	39	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	N-Nitrosodiphenylamine	39	U	39	UJ	LCS-L	ug/kg
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	Phenanthrene	1100	E	1100	J	E	ug/kg
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	2,4-Dimethylphenol	35	U *	35	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	2,4-Dinitrophenol	35	U *		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	2,6-Dinitrotoluene	35	U *	35	UJ	LCS-L	ug/kg
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	2-Nitrophenol	35	U *	35	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	4-Chloroaniline	70	U *	70	UJ	LCS-L, LCS-RPD	ug/kg

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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
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	4-Methylphenol	35	U	35	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	4-Nitrophenol	180	U *		R	LCS-L	ug/kg
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	Benzyl alcohol	70	U		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	N-Nitrosodimethylamine	35	U	35	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	N-Nitrosodiphenylamine	31	J	31	J	LCS-L	ug/kg
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	2,4-Dimethylphenol	35	U *	35	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	2,4-Dinitrophenol	35	U *		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	2,6-Dinitrotoluene	35	U *	35	UJ	LCS-L	ug/kg
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	2-Nitrophenol	35	U *	35	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	4-Chloroaniline	71	U *	71	UJ	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	4-Methylphenol	35	U	35	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	4-Nitrophenol	180	U *		R	LCS-L	ug/kg
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	Benzyl alcohol	71	U		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	N-Nitrosodimethylamine	35	U	35	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	N-Nitrosodiphenylamine	26	J	26	J	LCS-L	ug/kg
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	2,4-Dimethylphenol	40	U *	40	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	2,4-Dinitrophenol	40	U *		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	2,6-Dinitrotoluene	40	U *	40	UJ	LCS-L	ug/kg
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	2-Nitrophenol	40	U *	40	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	4-Chloroaniline	81	U *	81	UJ	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	4-Methylphenol	40	U	40	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	4-Nitrophenol	200	U *		R	LCS-L	ug/kg
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	Benzyl alcohol	81	U		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	N-Nitrosodimethylamine	40	U	40	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	N-Nitrosodiphenylamine	20	J	20	J	LCS-L	ug/kg
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	2,4-Dimethylphenol	4100	U *	4100	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	2,4-Dinitrophenol	4100	U *		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	2,6-Dinitrotoluene	4100	U *	4100	UJ	LCS-L	ug/kg
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	2-Nitrophenol	4100	U *	4100	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	4-Chloroaniline	8100	U *	8100	UJ	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	4-Methylphenol	4100	U	4100	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	4-Nitrophenol	20000	U *		R	LCS-L	ug/kg
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	Benzyl alcohol	8100	U		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	N-Nitrosodimethylamine	4100	U	4100	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	N-Nitrosodiphenylamine	4100	U	4100	UJ	LCS-L	ug/kg
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	2,4-Dimethylphenol	40	U *	40	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	2,4-Dinitrophenol	40	U *		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	2,6-Dinitrotoluene	40	U *	40	UJ	LCS-L	ug/kg
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	2-Nitrophenol	40	U *	40	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	4-Chloroaniline	80	U *	80	UJ	LCS-L, LCS-RPD	ug/kg

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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
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	4-Methylphenol	40	U	40	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	4-Nitrophenol	200	U *		R	LCS-L	ug/kg
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	Benzyl alcohol	80	U		R	LCS-L, LCS-RPD	ug/kg
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	N-Nitrosodimethylamine	40	U	40	UJ	LCS-RPD	ug/kg
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	N-Nitrosodiphenylamine	40	U	40	UJ	LCS-L	ug/kg
480-30346-1	480-30346-4	SW8270	OC-SB-519-0.0/1.0-XXX	2,4-Dinitrophenol	50	U *	50	UJ	LCS-RPD	ug/kg
480-30346-1	480-30346-4	SW8270	OC-SB-519-0.0/1.0-XXX	4-Nitrophenol	250	U *	250	UJ	LCS-L, LCS-RPD	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	2,4-Dinitrophenol	44	U *	44	UJ	LCS-RPD	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	4-Bromophenyl phenyl ether	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	4-Nitrophenol	220	U *	220	UJ	LCS-L, LCS-RPD	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Anthracene	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Azobenzene	44	U *	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Benzo(a)pyrene	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Benzo(b)fluoranthene	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Benzo(ghi)perylene	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Benzo(k)fluoranthene	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Carbazole	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Dibenz(a,h)anthracene	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Di-n-butylphthalate	220	U	220	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Fluoranthene	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Hexachlorobenzene	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Indeno(1,2,3-cd)pyrene	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	N-Nitrosodiphenylamine	50		50	J	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Pentachlorophenol	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	Phenanthrene	44	U	44	UJ	IS-L	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	2,4-Dinitrophenol	42	U *	42	UJ	LCS-RPD	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	4-Bromophenyl phenyl ether	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	4-Nitrophenol	210	U *	210	UJ	LCS-L, LCS-RPD	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	Anthracene	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	Azobenzene	42	U *	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	Carbazole	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	Di-n-butylphthalate	210	U	210	UJ	IS-L	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	Fluoranthene	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	Hexachlorobenzene	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	N-Nitrosodiphenylamine	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	Pentachlorophenol	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	Phenanthrene	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-7	SW8270	OC-SB-518-0.0/1.0-XXX	2,4-Dinitrophenol	23000	U *	23000	UJ	LCS-RPD	ug/kg
480-30346-1	480-30346-7	SW8270	OC-SB-518-0.0/1.0-XXX	4-Nitrophenol	110000	U *	110000	UJ	LCS-L, LCS-RPD	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	2,4-Dinitrophenol	42	U *	42	UJ	LCS-RPD	ug/kg

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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
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	4-Bromophenyl phenyl ether	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	4-Nitrophenol	210	U *	210	UJ	LCS-L, LCS-RPD	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	Anthracene	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	Azobenzene	42	U *	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	Carbazole	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	Di-n-butylphthalate	210	U	210	UJ	IS-L	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	Fluoranthene	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	Hexachlorobenzene	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	N-Nitrosodiphenylamine	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	Pentachlorophenol	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	Phenanthrene	42	U	42	UJ	IS-L	ug/kg
480-30346-1	480-30346-9	SW8270	OC-SB-518-13/15-XXX	2,4-Dinitrophenol	820	U *	820	UJ	LCS-RPD	ug/kg
480-30346-1	480-30346-9	SW8270	OC-SB-518-13/15-XXX	4-Nitrophenol	4100	U *	4100	UJ	LCS-L, LCS-RPD	ug/kg

Units:
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:
CCV%D = Continuing calibration %D
E = Result exceeds calibration range
IS-H = Internal Standard response above limit
IS-L = Internal Standard response below limit
LCS-L = LCS recovery low
LCS-RPD = LCS-LCSD RPD limit exceeded
MS-L = MS and/or MSD recovery low
PM = Sample percent moisture exceeds EPA guideline

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

Table 3.5
Data Validation Action Summary - Tributyltin
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
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
480-29598-1	480-29598-7	Organotins	OC-SB-528-0.0/1.0-XXX	TRIBUTYLTIN	5.5	U		R	PM	ug/kg

Units:
ug/Kg = microgram per kilogram

Validation Reason Codes:
PM = Sample percent moisture exceeds EPA guideline

Prepared by / Date: KJC 02/18/13
Checked by / Date: TLC 02/19/13

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

Table 3.6
Data Validation Action Summary - Metals
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sample Delivery Group	Lab Sample ID	Analysis Method	Fraction	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validation Qualifier	Validation Reason Code	Result Units
480-29598-1	480-29598-11	SW6010	T	OC-DUP-2	Tin	2.1	J^	2.1	J	QLS-L	mg/kg
480-29598-1	480-29598-7	SW6010	T	OC-SB-528-0.0/1.0-XXX	Tin	7.5	J^	7.5	J	PM, QLS-L	mg/kg
480-29598-1	480-29598-8	SW6010	T	OC-SB-528-1.0/3.0-XXX	Tin	2.4	J^	2.4	J	QLS-L	mg/kg

Units:
mg/Kg = milligram per kilogram

Validation Qualifier:
J = value is estimated

Fraction
T = Total (unfiltered)

Validation Reason Codes:
PM = Sample percent moisture exceeds EPA guideline
QLS-L = Quantitation Limit Standard recovery less than limits

Prepared by / Date: KJC 02/18/13
Checked by / Date: TLC 02/19/13

Table 3.7
Data Validation Action Summary - Hexavalent Chromium
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
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
480-29598-1	480-29598-7	SW7199	OC-SB-528-0.0/1.0-XXX	Chromium, Hexavalent	19		19	J	PM	mg/kg
480-29976-1	480-29976-1	SW7199	OC-SB-504-0.0/1.0-XXX	Chromium, Hexavalent	0.29		0.29	J	LCS-L, MS-L	mg/kg
480-29976-1	480-29976-10	SW7199	OC-SB-508-0.0/1.0-XXX	Chromium, Hexavalent	3	U	3	UJ	LCS-L, MS-L	mg/kg
480-29976-1	480-29976-11	SW7199	OC-SB-508-8.0/10-XXX	Chromium, Hexavalent	1.1		1.1	J	LCS-L, MS-L	mg/kg
480-29976-1	480-29976-12	SW7199	OC-SB-508-12/14-XXX	Chromium, Hexavalent	0.26		0.26	J	LCS-L, MS-L	mg/kg
480-29976-1	480-29976-2	SW7199	OC-SB-504-7.5/9.5-XXX	Chromium, Hexavalent	0.26	U	0.26	UJ	LCS-L, MS-L	mg/kg
480-29976-1	480-29976-3	SW7199	OC-SB-505-0.0/1.0-XXX	Chromium, Hexavalent	0.34		0.34	J	LCS-L, MS-L	mg/kg
480-29976-1	480-29976-4	SW7199	OC-SB-505-5.0/7.0-XXX	Chromium, Hexavalent	0.58		0.58	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-1	SW7199	OC-SB-513-0.0/1.0-XXX	Chromium, Hexavalent	0.23	U	0.23	UJ	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-13	SW7199	OC-SB-517-0.0/1.0-XXX	Chromium, Hexavalent	1.2		1.2	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-14	SW7199	OC-SB-517-6.0/8.0-XXX	Chromium, Hexavalent	0.32		0.32	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-15	SW7199	OC-SB-517-18/20-XXX	Chromium, Hexavalent	8		8	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-16	SW7199	OC-SB-524-0.0/1.0-XXX	Chromium, Hexavalent	0.31		0.31	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-17	SW7199	OC-SB-524-8.0/10-XXX	Chromium, Hexavalent	0.34		0.34	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-18	SW7199	OC-SB-524-27/29-XXX	Chromium, Hexavalent	0.25	U	0.25	UJ	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-19	SW7199	OC-SB-523-0.0/1.0-XXX	Chromium, Hexavalent	0.39		0.39	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-2	SW7199	OC-SB-513-7.0/9.0-XXX	Chromium, Hexavalent	1		1	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-20	SW7199	OC-SB-523-6.0/8.0-XXX	Chromium, Hexavalent	0.17	J	0.17	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-21	SW7199	OC-SB-523-22/24-XXX	Chromium, Hexavalent	1.1		1.1	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-22	SW7199	OC-DUP-4	Chromium, Hexavalent	0.18	J	0.18	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-3	SW7199	OC-SB-513-10/12-XXX	Chromium, Hexavalent	0.47		0.47	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-4	SW7199	OC-SB-514-0.0/1.0-XXX	Chromium, Hexavalent	0.54		0.54	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-5	SW7199	OC-SB-514-7.0/9.0-XXX	Chromium, Hexavalent	0.21	J	0.21	J	LCS-L, MS-L	mg/kg
480-30106-1	480-30106-6	SW7199	OC-SB-514-15/17-XXX	Chromium, Hexavalent	0.88		0.88	J	LCS-L, MS-L	mg/kg
480-30197-1	480-30197-1	SW7199	OC-SB-509-1.0/3.0-XXX	Chromium, Hexavalent	28		28	J	LCS-L	mg/kg
480-30197-1	480-30197-10	SW7199	OC-SB-525-0.0/1.0-XXX	Chromium, Hexavalent	0.52		0.52	J	LCS-L	mg/kg
480-30197-1	480-30197-11	SW7199	OC-SB-525-3.0/5.0-XXX	Chromium, Hexavalent	0.24	U	0.24	UJ	LCS-L	mg/kg
480-30197-1	480-30197-12	SW7199	OC-SB-525-18/20-XXX	Chromium, Hexavalent	9.7		9.7	J	LCS-L	mg/kg
480-30197-1	480-30197-2	SW7199	OC-SB-510-0.0/1.0-XXX	Chromium, Hexavalent	10		10	J	LCS-L	mg/kg
480-30197-1	480-30197-3	SW7199	OC-SB-510-7.0/9.0-XXX	Chromium, Hexavalent	6		6	J	LCS-L	mg/kg
480-30197-1	480-30197-7	SW7199	OC-SB-522-0.0/1.0-XXX	Chromium, Hexavalent	0.25	U	0.25	UJ	LCS-L	mg/kg
480-30197-1	480-30197-8	SW7199	OC-SB-522-8.0/10-XXX	Chromium, Hexavalent	1.6		1.6	J	LCS-L	mg/kg
480-30197-1	480-30197-9	SW7199	OC-SB-522-13/15-XXX	Chromium, Hexavalent	0.2	J	0.2	J	LCS-L	mg/kg
480-30346-1	480-30346-1	SW7199	OC-SB-521-0.0/1.0-XXX	Chromium, Hexavalent	110	U		R	PM	mg/kg
480-30346-1	480-30346-10	SW7199	OC-SB-509-0.0/1.0-XXX	Chromium, Hexavalent	27	U	27	UJ	LCS-L	mg/kg
480-30346-1	480-30346-2	SW7199	OC-SB-521-8.0/10-XXX	Chromium, Hexavalent	0.27		0.27	J	LCS-L	mg/kg
480-30346-1	480-30346-3	SW7199	OC-SB-521-16/18-XXX	Chromium, Hexavalent	48		48	J	LCS-L	mg/kg
480-30346-1	480-30346-4	SW7199	OC-SB-519-0.0/1.0-XXX	Chromium, Hexavalent	30	U	30	UJ	LCS-L	mg/kg
480-30346-1	480-30346-5	SW7199	OC-SB-519-8.0/10-XXX	Chromium, Hexavalent	0.29		0.29	J	LCS-L	mg/kg
480-30346-1	480-30346-6	SW7199	OC-SB-519-12/14-XXX	Chromium, Hexavalent	2.2		2.2	J	LCS-L	mg/kg
480-30346-1	480-30346-7	SW7199	OC-SB-518-0.0/1.0-XXX	Chromium, Hexavalent	28	U	28	UJ	LCS-L	mg/kg
480-30346-1	480-30346-8	SW7199	OC-SB-518-8.0/10-XXX	Chromium, Hexavalent	0.25	U	0.25	UJ	LCS-L	mg/kg
480-30346-1	480-30346-9	SW7199	OC-SB-518-13/15-XXX	Chromium, Hexavalent	36		36	J	LCS-L	mg/kg

Units:
mg/Kg = milligram per kilogram

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

Validation Reason Codes:
LCS-L = LCS recovery low
MS-L = MS and/or MSD recovery low
PM = Sample percent moisture exceeds EPA guideline

Prepared by / Date: KJC 02/18/13
Checked by / Date: TLC 02/19/13

Table 4.1
Tentatively Identified Compounds - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
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
480-29598-1	480-29598-10	SW8270	OC-SB-529-1.0/3.0-XXX	12/5/2012	6765-39-5	1-Heptadecene	16.31	97	TJN	JN	ug/kg	1	12/18/2012	8:42:00 PM
480-29598-1	480-29598-10	SW8270	OC-SB-529-1.0/3.0-XXX	12/5/2012	111-2-4	2,6,10,14,18,22-Tetracosahexaene, 2,6,10	16.46	46	TJN	JN	ug/kg	1	12/18/2012	8:42:00 PM
480-29598-1	480-29598-10	SW8270	OC-SB-529-1.0/3.0-XXX	12/5/2012	57-10-3	n-Hexadecanoic acid	13.76	98	TJN	JN	ug/kg	1	12/18/2012	8:42:00 PM
480-29598-1	480-29598-10	SW8270	OC-SB-529-1.0/3.0-XXX	12/5/2012	3386-33-2	Octadecane, 1-chloro-	16.67	36	TJN	JN	ug/kg	1	12/18/2012	8:42:00 PM
480-29598-1	480-29598-3	SW8270	OC-SB-526-0.0/1.0-XXX	12/5/2012	1000193-60-8	1,1,4a-Trimethyl-5,6-dimethylenedecahydr	18.45	150	TJN	JN	ug/kg	1	12/18/2012	6:35:00 PM
480-29598-1	480-29598-3	SW8270	OC-SB-526-0.0/1.0-XXX	12/5/2012	98-1-1	Furfural	4.08	420	TJN	JN	ug/kg	1	12/18/2012	6:35:00 PM
480-29598-1	480-29598-3	SW8270	OC-SB-526-0.0/1.0-XXX	12/5/2012	630-4-6	Hentriacontane	17.27	190	TJN	JN	ug/kg	1	12/18/2012	6:35:00 PM
480-29598-1	480-29598-3	SW8270	OC-SB-526-0.0/1.0-XXX	12/5/2012	57-10-3	n-Hexadecanoic acid	13.76	110	TJN	JN	ug/kg	1	12/18/2012	6:35:00 PM
480-29598-1	480-29598-3	SW8270	OC-SB-526-0.0/1.0-XXX	12/5/2012	629-92-5	Nonadecane	16.11	100	TJN	JN	ug/kg	1	12/18/2012	6:35:00 PM
480-29598-1	480-29598-3	SW8270	OC-SB-526-0.0/1.0-XXX	12/5/2012	638-67-5	Tricosane	16.66	210	TJN	JN	ug/kg	1	12/18/2012	6:35:00 PM
480-29598-1	480-29598-4	SW8270	OC-SB-526-1.0/3.0-XXX	12/5/2012	593-49-7	Heptacosane	16.66	23	TJN	JN	ug/kg	1	12/18/2012	7:00:00 PM
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	12/5/2012	23069-75-2	1,2,4-Triazolo[4,3-b]pyridazine, 8-methy	11.99	7800	TJN	JN	ug/kg	20	12/18/2012	7:26:00 PM
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	12/5/2012	107-39-1	1-Pentene, 2,4,4-trimethyl-	9.82	30000	TJN	JN	ug/kg	20	12/18/2012	7:26:00 PM
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	12/5/2012	7756-94-7	1-Propene, 2-methyl-, trimer	9.67	5100	TJN	JN	ug/kg	20	12/18/2012	7:26:00 PM
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	12/5/2012	123-48-8	3-Heptene, 2,2,4,6,6-pentamethyl-	9.61	79000	TJN	JN	ug/kg	20	12/18/2012	7:26:00 PM
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	12/5/2012	123-48-8	3-Heptene, 2,2,4,6,6-pentamethyl-	9.77	6100	TJN	JN	ug/kg	20	12/18/2012	7:26:00 PM
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	12/5/2012	540-88-5	Acetic acid, 1,1-dimethylethyl ester	4.14	42000	TJN	JN	ug/kg	20	12/18/2012	7:26:00 PM
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	12/5/2012	4/9/4390	Nonane, 2,2,4,4,6,8,8-heptamethyl-	9.72	46000	TJN	JN	ug/kg	20	12/18/2012	7:26:00 PM
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	12/5/2012	1000126-4-1	Styrene, 2-nitro-3'-[4-methylphenyloxy]-	15.94	15000	TJN	JN	ug/kg	20	12/18/2012	7:26:00 PM
480-29598-1	480-29598-7	SW8270	OC-SB-528-0.0/1.0-XXX	12/5/2012	1000126-4-1	Styrene, 2-nitro-3'-[4-methylphenyloxy]-	16.17	7700	TJN	JN	ug/kg	20	12/18/2012	7:26:00 PM
480-29598-1	480-29598-8	SW8270	OC-SB-528-1.0/3.0-XXX	12/5/2012	123-48-8	3-Heptene, 2,2,4,6,6-pentamethyl-	9.61	26000	TJN	JN	ug/kg	20	12/18/2012	7:51:00 PM
480-29598-1	480-29598-8	SW8270	OC-SB-528-1.0/3.0-XXX	12/5/2012	313-87-1	8H-Dinaphtho[2,3-c:2',3'-g]carbazole	18.12	820	TJN	JN	ug/kg	20	12/18/2012	7:51:00 PM
480-29598-1	480-29598-8	SW8270	OC-SB-528-1.0/3.0-XXX	12/5/2012	4/9/4390	Nonane, 2,2,4,4,6,8,8-heptamethyl-	9.73	15000	TJN	JN	ug/kg	20	12/18/2012	7:51:00 PM
480-29598-1	480-29598-9	SW8270	OC-SB-529-0.0/1.0-XXX	12/5/2012	77899-10-6	(Z)14-Tricosenyl formate	17.11	520	TJN	JN	ug/kg	1	12/18/2012	8:16:00 PM
480-29598-1	480-29598-9	SW8270	OC-SB-529-0.0/1.0-XXX	12/5/2012	1000158-8-0	.beta.-Humulene	18.77	360	TJN	JN	ug/kg	1	12/18/2012	8:16:00 PM
480-29598-1	480-29598-9	SW8270	OC-SB-529-0.0/1.0-XXX	12/5/2012	121-34-6	Benzoic acid, 4-hydroxy-3-methoxy-	11.67	620	TJN	JN	ug/kg	1	12/18/2012	8:16:00 PM
480-29598-1	480-29598-9	SW8270	OC-SB-529-0.0/1.0-XXX	12/5/2012	630-4-6	Hentriacontane	17.28	1100	TJN	JN	ug/kg	1	12/18/2012	8:16:00 PM
480-29598-1	480-29598-9	SW8270	OC-SB-529-0.0/1.0-XXX	12/5/2012	630-3-5	Nonacosane	16.67	1300	TJN	JN	ug/kg	1	12/18/2012	8:16:00 PM
480-29598-1	480-29598-9	SW8270	OC-SB-529-0.0/1.0-XXX	12/5/2012	121-33-5	Vanillin	10.37	360	TJN	JN	ug/kg	1	12/18/2012	8:16:00 PM
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	12/12/2012	TIC04	Unknown	6.35	27	TJ	JN	ug/kg	1	12/19/2012	9:03:00 PM
480-30106-1	480-30106-11	SW8270	OC-SB-516-6.0/8.0-XXX	12/12/2012	TIC05	Unknown	7.49	25	TJ	JN	ug/kg	1	12/19/2012	9:03:00 PM
480-30106-1	480-30106-12	SW8270	OC-SB-516-15/17-XXX	12/12/2012	TIC03	Unknown	6.34	28	TJ	JN	ug/kg	1	12/19/2012	9:28:00 PM
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	12/12/2012	149-57-5	Hexanoic acid, 2-ethyl-	7.67	230	TJN	JN	ug/kg	1	12/19/2012	9:54:00 PM
480-30106-1	480-30106-13	SW8270	OC-SB-517-0.0/1.0-XXX	12/12/2012	TIC02	Unknown	9.6	280	TJ	JN	ug/kg	1	12/19/2012	9:54:00 PM
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	12/12/2012	TIC07	Unknown	15.3	44	TJ	JN	ug/kg	1	12/19/2012	10:19:00 PM
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	12/12/2012	TIC03	Unknown	4.65	21	TJ	JN	ug/kg	1	12/19/2012	10:19:00 PM
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	12/12/2012	TIC04	Unknown	6.33	22	TJ	JN	ug/kg	1	12/19/2012	10:19:00 PM
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	12/12/2012	TIC05	Unknown	9.61	36	TJ	JN	ug/kg	1	12/19/2012	10:19:00 PM
480-30106-1	480-30106-14	SW8270	OC-SB-517-6.0/8.0-XXX	12/12/2012	TIC06	Unknown	9.72	21	TJ	JN	ug/kg	1	12/19/2012	10:19:00 PM
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	12/12/2012	112-95-8	Eicosane	16.4	48	TJN	JN	ug/kg	1	12/19/2012	10:45:00 PM
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	12/12/2012	629-78-7	Heptadecane	16.68	48	TJN	JN	ug/kg	1	12/19/2012	10:45:00 PM
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	12/12/2012	TIC04	Unknown	15.87	23	TJ	JN	ug/kg	1	12/19/2012	10:45:00 PM
480-30106-1	480-30106-15	SW8270	OC-SB-517-18/20-XXX	12/12/2012	TIC03	Unknown	6.34	28	TJ	JN	ug/kg	1	12/19/2012	10:45:00 PM
480-30106-1	480-30106-4	SW8270	OC-SB-514-0.0/1.0-XXX	12/12/2012	630-3-5	Nonacosane	17.28	86	TJN	JN	ug/kg	1	12/20/2012	4:33:00 PM
480-30106-1	480-30106-4	SW8270	OC-SB-514-0.0/1.0-XXX	12/12/2012	TIC04	Unknown	16.68	260	TJ	JN	ug/kg	1	12/20/2012	4:33:00 PM
480-30106-1	480-30106-4	SW8270	OC-SB-514-0.0/1.0-XXX	12/12/2012	TIC05	Unknown	17.09	50	TJ	JN	ug/kg	1	12/20/2012	4:33:00 PM

Table 4.1
Tentatively Identified Compounds - SVOCs
Data Validation Report
Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
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
480-30106-1	480-30106-4	SW8270	OC-SB-514-0.0/1.0-XXX	12/12/2012	TIC06	Unknown	17.51	110	TJ	JN	ug/kg	1	12/20/2012	4:33:00 PM
480-30106-1	480-30106-4	SW8270	OC-SB-514-0.0/1.0-XXX	12/12/2012	TIC07	Unknown	17.81	270	TJ	JN	ug/kg	1	12/20/2012	4:33:00 PM
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	12/12/2012	124-18-5	Decane	6.35	25	TJN	JN	ug/kg	1	12/19/2012	7:21:00 PM
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	12/12/2012	112-95-8	Eicosane	16.4	32	TJN	JN	ug/kg	1	12/19/2012	7:21:00 PM
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	12/12/2012	629-99-2	Pentacosane	15.59	32	TJN	JN	ug/kg	1	12/19/2012	7:21:00 PM
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	12/12/2012	638-67-5	Tricosane	16.13	29	TJN	JN	ug/kg	1	12/19/2012	7:21:00 PM
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	12/12/2012	1928-30-9	Tricosane, 2-methyl-	15.87	35	TJN	JN	ug/kg	1	12/19/2012	7:21:00 PM
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	12/12/2012	TIC03	Unknown	16.68	42	TJ	JN	ug/kg	1	12/19/2012	7:21:00 PM
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	12/12/2012	TIC04	Unknown	16.98	32	TJ	JN	ug/kg	1	12/19/2012	7:21:00 PM
480-30106-1	480-30106-5	SW8270	OC-SB-514-7.0/9.0-XXX	12/12/2012	TIC01	Unknown	3.87	43	TJ	JN	ug/kg	1	12/19/2012	7:21:00 PM
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	12/12/2012	TIC06	Unknown	14.14	35	TJ	JN	ug/kg	1	12/19/2012	7:47:00 PM
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	12/12/2012	TIC07	Unknown	16.02	65	TJ	JN	ug/kg	1	12/19/2012	7:47:00 PM
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	12/12/2012	TIC01	Unknown	3.03	27	TJ	JN	ug/kg	1	12/19/2012	7:47:00 PM
480-30106-1	480-30106-6	SW8270	OC-SB-514-15/17-XXX	12/12/2012	TIC05	Unknown	6.34	24	TJ	JN	ug/kg	1	12/19/2012	7:47:00 PM
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	12/12/2012	TIC05	Unknown	15.87	25	TJ	JN	ug/kg	1	12/19/2012	8:12:00 PM
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	12/12/2012	TIC06	Unknown	16.13	22	TJ	JN	ug/kg	1	12/19/2012	8:12:00 PM
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	12/12/2012	TIC07	Unknown	16.4	21	TJ	JN	ug/kg	1	12/19/2012	8:12:00 PM
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	12/12/2012	TIC03	Unknown	6.34	27	TJ	JN	ug/kg	1	12/19/2012	8:12:00 PM
480-30106-1	480-30106-8	SW8270	OC-SB-515-6.0/8.0-XXX	12/12/2012	TIC04	Unknown	7.48	25	TJ	JN	ug/kg	1	12/19/2012	8:12:00 PM
480-30106-1	480-30106-9	SW8270	OC-SB-515-13/15-XXX	12/12/2012	544-85-4	Dotriacontane	16.12	40	TJN	JN	ug/kg	1	12/20/2012	11:01:00 AM
480-30106-1	480-30106-9	SW8270	OC-SB-515-13/15-XXX	12/12/2012	630-1-3	Hexacosane	15.86	38	TJN	JN	ug/kg	1	12/20/2012	11:01:00 AM
480-30106-1	480-30106-9	SW8270	OC-SB-515-13/15-XXX	12/12/2012	630-2-4	Octacosane	16.39	50	TJN	JN	ug/kg	1	12/20/2012	11:01:00 AM
480-30106-1	480-30106-9	SW8270	OC-SB-515-13/15-XXX	12/12/2012	629-99-2	Pentacosane	15.58	37	TJN	JN	ug/kg	1	12/20/2012	11:01:00 AM
480-30106-1	480-30106-9	SW8270	OC-SB-515-13/15-XXX	12/12/2012	TIC05	Unknown	16.67	38	TJ	JN	ug/kg	1	12/20/2012	11:01:00 AM
480-30106-1	480-30106-9	SW8270	OC-SB-515-13/15-XXX	12/12/2012	TIC01	Unknown	3.91	52	TJ	JN	ug/kg	1	12/20/2012	11:01:00 AM
480-30106-1	480-30106-9	SW8270	OC-SB-515-13/15-XXX	12/12/2012	TIC04	Unknown	7.48	39	TJ	JN	ug/kg	1	12/20/2012	11:01:00 AM
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	12/13/2012	14021-23-9	D-Friedoolean-14-ene, 3-methoxy-, (3.bet	18.14	290	TJN	JN	ug/kg	1	12/20/2012	12:17:00 PM
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	12/13/2012	7225-64-1	Heptadecane, 9-octyl-	17.28	710	TJN	JN	ug/kg	1	12/20/2012	12:17:00 PM
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	12/13/2012	57-10-3	n-Hexadecanoic acid	13.77	340	TJN	JN	ug/kg	1	12/20/2012	12:17:00 PM
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	12/13/2012	26603-23-6	p,p'-Dioctyldiphenylamine	16.99	1500	TJN	JN	ug/kg	1	12/20/2012	12:17:00 PM
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	12/13/2012	TIC02	Unknown	17.44	350	TJ	JN	ug/kg	1	12/20/2012	12:17:00 PM
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	12/13/2012	TIC03	Unknown	18.25	740	TJ	JN	ug/kg	1	12/20/2012	12:17:00 PM
480-30197-1	480-30197-4	SW8270	OC-SB-520-0.0/1.0-XXX	12/13/2012	TIC04	Unknown	18.48	770	TJ	JN	ug/kg	1	12/20/2012	12:17:00 PM
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	12/13/2012	629-99-2	Pentacosane	16.67	58	TJN	JN	ug/kg	1	12/20/2012	12:43:00 PM
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	12/13/2012	TIC05	Unknown	13.77	33	TJ	JN	ug/kg	1	12/20/2012	12:43:00 PM
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	12/13/2012	TIC06	Unknown	16.13	44	TJ	JN	ug/kg	1	12/20/2012	12:43:00 PM
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	12/13/2012	TIC07	Unknown	16.4	32	TJ	JN	ug/kg	1	12/20/2012	12:43:00 PM
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	12/13/2012	TIC08	Unknown	16.97	54	TJ	JN	ug/kg	1	12/20/2012	12:43:00 PM
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	12/13/2012	TIC01	Unknown	3.84	39	TJ	JN	ug/kg	1	12/20/2012	12:43:00 PM
480-30197-1	480-30197-5	SW8270	OC-SB-520-8.0/10-XXX	12/13/2012	TIC04	Unknown	4.64	39	TJ	JN	ug/kg	1	12/20/2012	12:43:00 PM
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	12/13/2012	629-94-7	Heneicosane	15.59	29	TJN	JN	ug/kg	1	12/20/2012	1:08:00 PM
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	12/13/2012	TIC05	Unknown	16.13	27	TJ	JN	ug/kg	1	12/20/2012	1:08:00 PM
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	12/13/2012	TIC06	Unknown	16.4	34	TJ	JN	ug/kg	1	12/20/2012	1:08:00 PM
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	12/13/2012	TIC07	Unknown	16.97	26	TJ	JN	ug/kg	1	12/20/2012	1:08:00 PM

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Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
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
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	12/13/2012	TIC01	Unknown	3.85	49	TJ	JN	ug/kg	1	12/20/2012	1:08:00 PM
480-30197-1	480-30197-6	SW8270	OC-SB-520-18/20-XXX	12/13/2012	TIC04	Unknown	6.33	24	TJ	JN	ug/kg	1	12/20/2012	1:08:00 PM
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	12/13/2012	22611-26-3	D:C-Friedoolean-8-en-3-one	18.8	3200	TJN	JN	ug/kg	1	12/20/2012	1:34:00 PM
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	12/13/2012	629-94-7	Heneicosane	15.59	97	TJN	JN	ug/kg	1	12/20/2012	1:34:00 PM
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	12/13/2012	630-1-3	Hexacosane	17.28	140	TJN	JN	ug/kg	1	12/20/2012	1:34:00 PM
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	12/13/2012	638-66-4	Octadecanal	17.83	250	TJN	JN	ug/kg	1	12/20/2012	1:34:00 PM
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	12/13/2012	6561-44-0	Octadecane, 3-methyl-	16.13	290	TJN	JN	ug/kg	1	12/20/2012	1:34:00 PM
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	12/13/2012	TIC02	Unknown	15.04	110	TJ	JN	ug/kg	1	12/20/2012	1:34:00 PM
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	12/13/2012	TIC03	Unknown	18.48	700	TJ	JN	ug/kg	1	12/20/2012	1:34:00 PM
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	12/13/2012	TIC04	Unknown	18.57	920	TJ	JN	ug/kg	1	12/20/2012	1:34:00 PM
480-30197-1	480-30197-7	SW8270	OC-SB-522-0.0/1.0-XXX	12/13/2012	TIC05	Unknown	18.61	290	TJ	JN	ug/kg	1	12/20/2012	1:34:00 PM
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	12/13/2012	TIC02	Unknown	15.06	4100	TJ	JN	ug/kg	100	12/21/2012	10:38:00 AM
480-30197-1	480-30197-8	SW8270	OC-SB-522-8.0/10-XXX	12/13/2012	TIC03	Unknown	17	15000	TJ	JN	ug/kg	100	12/21/2012	10:38:00 AM
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	12/13/2012	2175-91-9	1,3-Cyclopentadiene, 5-(1-methylethylide	4.63	52	TJN	JN	ug/kg	1	12/20/2012	2:26:00 PM
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	12/13/2012	629-94-7	Heneicosane	16.4	30	TJN	JN	ug/kg	1	12/20/2012	2:26:00 PM
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	12/13/2012	593-45-3	Octadecane	16.68	26	TJN	JN	ug/kg	1	12/20/2012	2:26:00 PM
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	12/13/2012	TIC05	Unknown	15.87	27	TJ	JN	ug/kg	1	12/20/2012	2:26:00 PM
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	12/13/2012	TIC06	Unknown	16.97	43	TJ	JN	ug/kg	1	12/20/2012	2:26:00 PM
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	12/13/2012	TIC07	Unknown	17.28	31	TJ	JN	ug/kg	1	12/20/2012	2:26:00 PM
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	12/13/2012	TIC01	Unknown	3.83	38	TJ	JN	ug/kg	1	12/20/2012	2:26:00 PM
480-30197-1	480-30197-9	SW8270	OC-SB-522-13/15-XXX	12/13/2012	TIC04	Unknown	7.47	34	TJ	JN	ug/kg	1	12/20/2012	2:26:00 PM
480-30346-1	480-30346-4	SW8270	OC-SB-519-0.0/1.0-XXX	12/14/2012	21129-9-9	1,2-Tetradecanediol	16.8	33	TJN	JN	ug/kg	1	12/20/2012	4:58:00 PM
480-30346-1	480-30346-4	SW8270	OC-SB-519-0.0/1.0-XXX	12/14/2012	593-45-3	Octadecane	16.69	25	TJN	JN	ug/kg	1	12/20/2012	4:58:00 PM
480-30346-1	480-30346-4	SW8270	OC-SB-519-0.0/1.0-XXX	12/14/2012	TIC02	Unknown	15.05	100	TJ	JN	ug/kg	1	12/20/2012	4:58:00 PM
480-30346-1	480-30346-4	SW8270	OC-SB-519-0.0/1.0-XXX	12/14/2012	TIC03	Unknown	16.22	110	TJ	JN	ug/kg	1	12/20/2012	4:58:00 PM
480-30346-1	480-30346-4	SW8270	OC-SB-519-0.0/1.0-XXX	12/14/2012	TIC04	Unknown	16.52	44	TJ	JN	ug/kg	1	12/20/2012	4:58:00 PM
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	12/14/2012	14949-12-3	5.beta.-Cholest-23-ene, (Z)-	15.31	46	TJN	JN	ug/kg	1	12/20/2012	5:24:00 PM
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	12/14/2012	TIC04	Unknown	13.78	64	TJ	JN	ug/kg	1	12/20/2012	5:24:00 PM
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	12/14/2012	TIC05	Unknown	16.41	78	TJ	JN	ug/kg	1	12/20/2012	5:24:00 PM
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	12/14/2012	TIC06	Unknown	16.69	100	TJ	JN	ug/kg	1	12/20/2012	5:24:00 PM
480-30346-1	480-30346-5	SW8270	OC-SB-519-8.0/10-XXX	12/14/2012	TIC07	Unknown	16.98	53	TJ	JN	ug/kg	1	12/20/2012	5:24:00 PM
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	12/14/2012	TIC05	Unknown	13.77	29	TJ	JN	ug/kg	1	12/20/2012	5:49:00 PM
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	12/14/2012	TIC06	Unknown	16.13	32	TJ	JN	ug/kg	1	12/20/2012	5:49:00 PM
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	12/14/2012	TIC07	Unknown	16.4	190	TJ	JN	ug/kg	1	12/20/2012	5:49:00 PM
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	12/14/2012	TIC08	Unknown	16.68	55	TJ	JN	ug/kg	1	12/20/2012	5:49:00 PM
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	12/14/2012	TIC09	Unknown	16.99	91	TJ	JN	ug/kg	1	12/20/2012	5:49:00 PM
480-30346-1	480-30346-6	SW8270	OC-SB-519-12/14-XXX	12/14/2012	TIC04	Unknown	6.34	31	TJ	JN	ug/kg	1	12/20/2012	5:49:00 PM
480-30346-1	480-30346-7	SW8270	OC-SB-518-0.0/1.0-XXX	12/14/2012	TIC01	Unknown	15.85	17000	TJ	JN	ug/kg	500	12/21/2012	3:08:00 PM
480-30346-1	480-30346-7	SW8270	OC-SB-518-0.0/1.0-XXX	12/14/2012	TIC02	Unknown	16.99	34000	TJ	JN	ug/kg	500	12/21/2012	3:08:00 PM
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	12/14/2012	TIC05	Unknown	13.78	34	TJ	JN	ug/kg	1	12/20/2012	6:40:00 PM
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	12/14/2012	TIC06	Unknown	16.14	30	TJ	JN	ug/kg	1	12/20/2012	6:40:00 PM
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	12/14/2012	TIC07	Unknown	16.41	63	TJ	JN	ug/kg	1	12/20/2012	6:40:00 PM
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	12/14/2012	TIC09	Unknown	16.69	40	TJ	JN	ug/kg	1	12/20/2012	6:40:00 PM
480-30346-1	480-30346-8	SW8270	OC-SB-518-8.0/10-XXX	12/14/2012	TIC04	Unknown	6.35	27	TJ	JN	ug/kg	1	12/20/2012	6:40:00 PM

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Operable Unit 1 and 2 December 2012 Supplemental Soil Investigation
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
480-30346-1	480-30346-9	SW8270	OC-SB-518-13/15-XXX	12/14/2012	TIC02	Unknown	15.07	410	TJ	JN	ug/kg	20	12/21/2012	11:54:00 AM
480-30346-1	480-30346-9	SW8270	OC-SB-518-13/15-XXX	12/14/2012	TIC03	Unknown	15.88	510	TJ	JN	ug/kg	20	12/21/2012	11:54:00 AM
480-30346-1	480-30346-9	SW8270	OC-SB-518-13/15-XXX	12/14/2012	TIC04	Unknown	17.01	1000	TJ	JN	ug/kg	20	12/21/2012	11:54:00 AM

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 03/18/13
Checked by / Date: TLC 03/19/13

CHECKLISTS

CHEMIST REVIEW-VALIDATION CHECKLIST

pH by Method 9045C
ORP by Method SM20 2580B

Project: Olin Chemical Superfund Site
Project #: 6107130016-10
Date: 2-1-13

Method: Hexavalent Chromium by 7199
Laboratory and SDG: TAL Edison NJ 480-29484-1
Reviewer: Tige Cunningham

☑ **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

All Results are ND

OK ✓

2. **Holding Time and Sample Preservation (30 days to digest, 7 days to analyze digestate)**

OK { Hold Times met for Cr^{+6}
ORP & pH analyzed w/in 24hrs

3. **QC Blanks**

Method blanks MB 460-138391
MB 460-140206 } ND's

4. **Laboratory Control Sample Review (% recovery 80-120, RPD 20)**

Soluble & insoluble LCS spikes w/ in limits

5. **Field Duplicate Precision (RPD 50)**

Collected @ OC-SB-529-1.0/3.0-XXX

6. **Lab Duplicate Precision (RPD 35)**

OC-SS-521-0.0/1.0-XXX analyzed as Lab Dup. Both ND

7. **Matrix Spike Results (if applicable) (% recovery 75-125, RPD 35)**

Two batches extracted (prepped).
OC-SS-521-0.0/1.0-XXX spiked.

Soluble Recoveries 13% & 23%
Insoluble Recoveries 23% & 22%
Sample ~~was~~ has reducing conditions
ORP of 67 / pH 3.87
No Quals. Post Spikes were 99%/104%

8. **Surrogate Recovery (if applicable)**

Not applicable.

9. **Internal Standard Recovery (if applicable)**

Not applicable.

FULL VALIDATION CHECKS

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

☑ **Initial Calibration**

Check on 12/12/12 @ 12:58pm

☑ **Continuing Calibration Verification**

CCV's w/in Limits

Transcription and Calculation Checks

☑ **Instrument Calibration**

Checked

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

No detections confirmed in Raw data

☑ **Laboratory Control Sample**

✓

☑ **Matrix Spike**

✓

☑ **Field Sample Results**

All Results were ND, Chromatograms were verified

☐ **Surrogate Recovery**
Not applicable.

SDG 480-29484-1	Cr+6 Line from 12/12/2012		
Std Level	**Cr+6 Std Conc (ppb)**	**Area Response Cr+6**	
1	5	15.99	
2	10	34	
3	25	84.73	
4	50	171.00	
	y	x	
	Cr+6		
slope	0.290821771	0.287760155	**intercept**
+-	0.000878313	0.085401676	**+-**
r2	0.999981758	0.105702797	**s(y)**
F	109636.5116	2	**degrees of freedom**
regression ss	1224.977654	0.022346163	**residual ss**
ICV from 12/12/12 12:58pm			
Cr+6			
Response	84.39		
Amount Found (ug/l)	24.830		
Amount Nominal (ug/l)	25		
Percent Diff. (%)	-0.68		
MB from 12/12/12 1:15pm			
Cr+6			
Response	0.951		
Amount Found (ug/l)	0.564		
LCS from 12/12/12 1:39pm			
Cr+6			
Response	38.574		
Amount Found (ug/l)	11.506		
Amount Nominal (ug/l)	17.8		
Percent Recovery (%)	64.64		
matrix spike on sample OC-SS-521-0.0/1.0-XXX			
Cr+6	on 12/12/12 3:11pm		
Response	27.206		
Amount Found (ug/l)	8.200	see raw data sheet for calculation check	

5-IN
MATRIX SPIKE SOLUBLE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-29484-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 139567		Date: 12/12/2012 14:55	Prep Batch:		138391	Date: 12/06/2012 12:30					
7199	480-29484-14	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29484-14 MSS	Chromium (hexavalent)	ND		mg/Kg	97.6	13	75-125			F
Batch ID: 139567		Date: 12/12/2012 15:11	Prep Batch:		138391	Date: 12/06/2012 12:30					
7199	480-29484-14	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29484-14 MSI	Chromium (hexavalent)	400		mg/Kg	1730	23	75-125			F
Batch ID: 139567		Date: 12/12/2012 15:28	Prep Batch:		138391	Date: 12/06/2012 12:30					
7199	480-29484-14	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29484-14 PDS	Chromium (hexavalent)	98.9		mg/Kg	97.6	101	85-115			
Batch ID: 140322		Date: 12/17/2012 19:38	Prep Batch:		140206	Date: 12/14/2012 14:38					
7199	480-29484-14	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29484-14 MSS	Chromium (hexavalent)	22.5		mg/Kg	97.6	23	75-125			F
Batch ID: 140322		Date: 12/17/2012 20:03	Prep Batch:		140206	Date: 12/14/2012 14:38					
7199	480-29484-14	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29484-14 MSI	Chromium (hexavalent)	381		mg/Kg	1730	22	75-125			F
Batch ID: 140322		Date: 12/17/2012 20:11	Prep Batch:		140206	Date: 12/14/2012 14:38					
7199	480-29484-14	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29484-14 PDS	Chromium (hexavalent)	104		mg/Kg	97.6	106	85-115			

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 V-IN

Report date: 12/13/2012 9:32:40 AM
Printed by: TestAmerica - Edison

Ident: ICV
Analysis from: 12/12/2012 12:58:35 PM
File: wc121258.chw Last save: 12/12/2012 1:02:05 PM

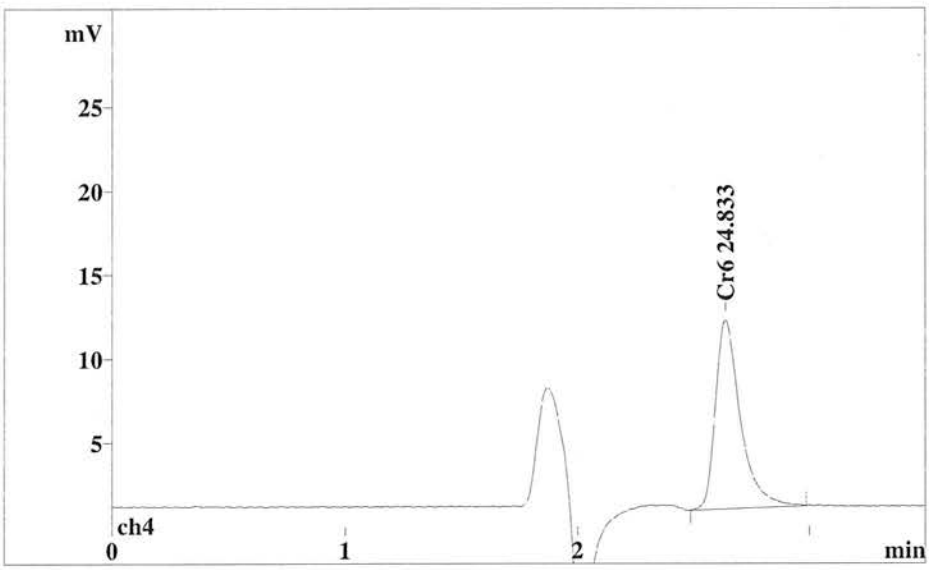
Method: stl_hexchrome_soil.mtw Last save: 12/12/2012 12:53:
Run operator: TestAmerica - Edison
Analysis number: 40061

SAMPLE: 100ul loop
:
Vial number: 6
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000

COLUMN: A Supp 5-150
Size: 4.6 x 150 mm
Number:
Part.size: 7.0 µm

ELUENT: 66 g (NH4)SO4 / 13ml NH4OH-2L DI

Flow: 0.75 mL/min
Temperature: 25.0°C
Pressure: 9.1 MPa



ICV calculation check

No;	Retention; min;	Width/2; min;	Height; mV;	Height; %;	Area; mV*sec;	Area; %;	K'; ;	Resolution; n,n+1;	
1;	2.64;	0.109;	11.23;	100.01;	84.395;	100.00;	0.00;	0.00;	27

24.83 calculated
25

99% Rec

TC 2/4/13

Report date: 12/13/2012 9:32:43 AM
Printed by: TestAmerica - Edison

Ident: ICB
Analysis from: 12/12/2012 1:06:51 PM
File: wc121306.chw Last save: 12/12/2012 1:10:21 PM

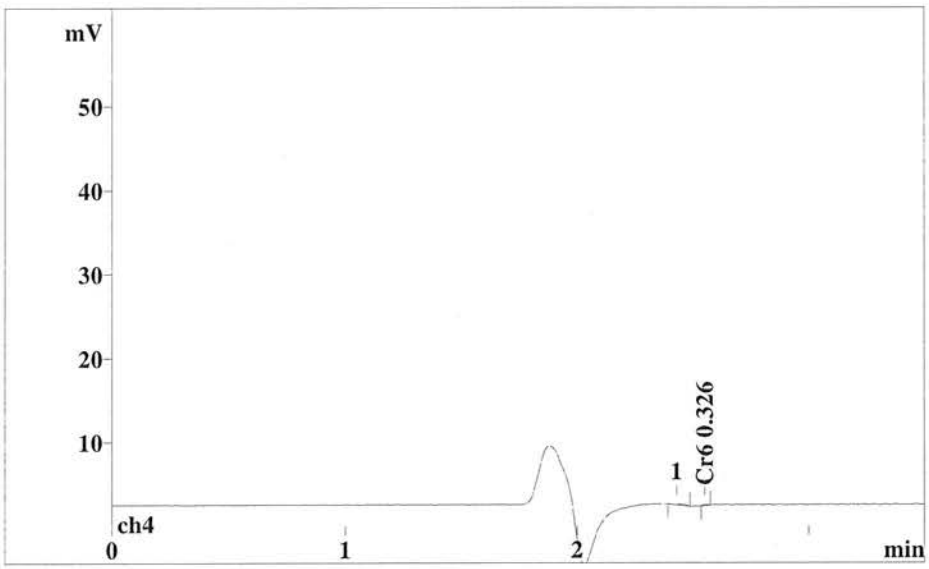
Method: stl_hexchrome_soil.mtw Last save: 12/12/2012 12:53:
Run operator: TestAmerica - Edison
Analysis number: 40062

SAMPLE: 100ul loop
:
Vial number: 7
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000

COLUMN: A Supp 5-150
Size: 4.6 x 150 mm
Number:
Part.size: 7.0 µm

ELUENT: 66 g (NH4)SO4 / 13ml NH4OH-2L DI

Flow: 0.75 mL/min
Temperature: 25.0°C
Pressure: 9.1 MPa



Calibration Blank check

No;	Retention; min;	Width/2; min;	Height; mV;	Height; %;	Area; mV*sec;	Area; %;	K'; ;	Resolution; n,n+1;	
1;	2.55;	0.016;	0.13;	43.91;	0.136;	18.66;	0.00;	0.00;	1232

✓

2/4/13
TC

Report date: 12/13/2012 9:32:46 AM
Printed by: TestAmerica - Edison

Ident: MB 460-138391/1-A@10
Analysis from: 12/12/2012 1:15:06 PM
File: wc121315.chw Last save: 12/12/2012 1:18:37 PM

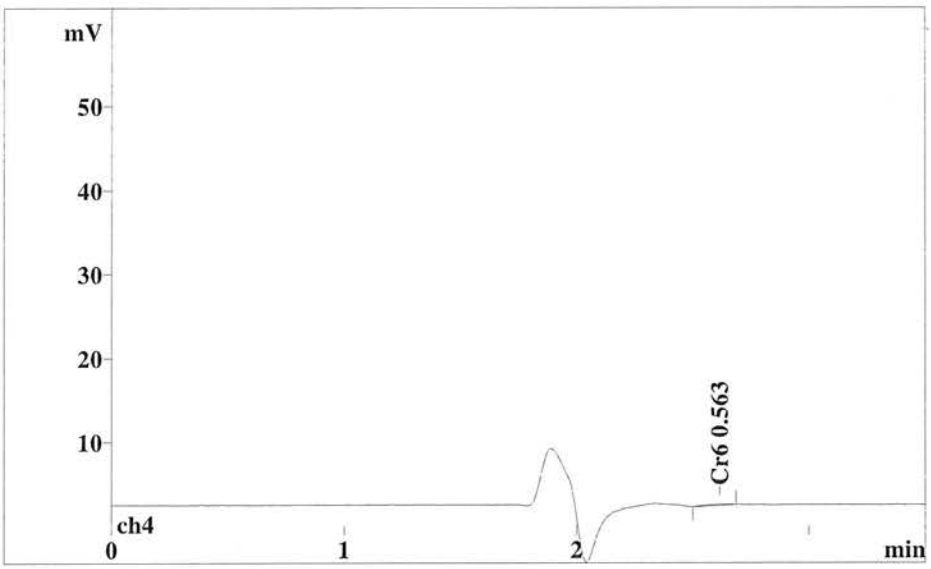
Method: stl_hexchrome_soil.mtw Last save: 12/12/2012 12:53:
Run operator: TestAmerica - Edison
Analysis number: 40063

SAMPLE: 100ul loop
:
Vial number: 8
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000

COLUMN: A Supp 5-150
Size: 4.6 x 150 mm
Number:
Part.size: 7.0 µm

ELUENT: 66 g (NH4)SO4 / 13ml NH4OH-2L DI

Flow: 0.75 mL/min
Temperature: 25.0°C
Pressure: 8.8 MPa



Method Blank Check

No;	Retention; min;	Width/2; min;	Height; mV;	Height; %;	Area; mV*sec;	Area; %;	K'; ;	Resolution; n,n+1;	
1;	2.61;	0.143;	0.13;	97.28;	0.951;	100.00;	0.00;	0.00;	32

TC 2/5/13

Report date: 12/13/2012 9:32:56 AM
Printed by: TestAmerica - Edison

Ident: LCSS 460-138391/2-A@25
Analysis from: 12/12/2012 1:39:58 PM
File: wc121339.chw Last save: 12/12/2012 1:43:28 PM

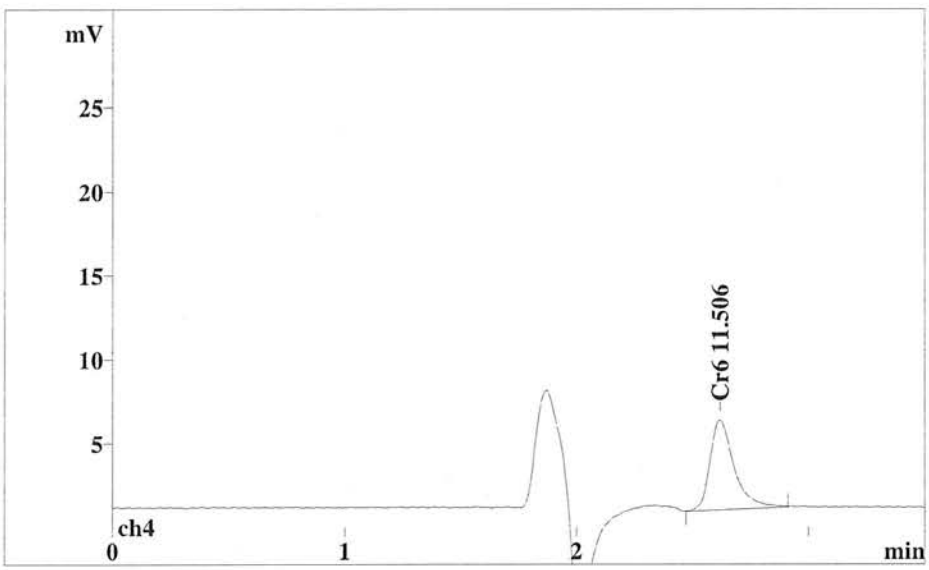
Method: stl_hexchrome_soil.mtw Last save: 12/12/2012 12:53:
Run operator: TestAmerica - Edison
Analysis number: 40066

SAMPLE: 100ul loop
:
Vial number: 11
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000

COLUMN: A Supp 5-150
Size: 4.6 x 150 mm
Number:
Part.size: 7.0 µm

ELUENT: 66 g (NH4)SO4 / 13ml NH4OH-2L DI

Flow: 0.75 mL/min
Temperature: 25.0°C
Pressure: 9.1 MPa



LCS calculation check

No;	Retention; min;	Width/2; min;	Height; mV;	Height; %;	Area; mV*sec;	Area; %;	K'; ;	Resolution; n,n+1;	
1;	2.62;	0.104;	5.34;	100.00;	38.574;	100.00;	0.00;	0.00;	29

See excel sheet

2/5/13
TC

Report date: 12/13/2012 9:33:37 AM
Printed by: TestAmerica - Edison

Ident: 480-29484-B-14-D MSI@500
Analysis from: 12/12/2012 3:11:45 PM
File: wc121511.chw Last save: 12/12/2012 3:15:15 PM

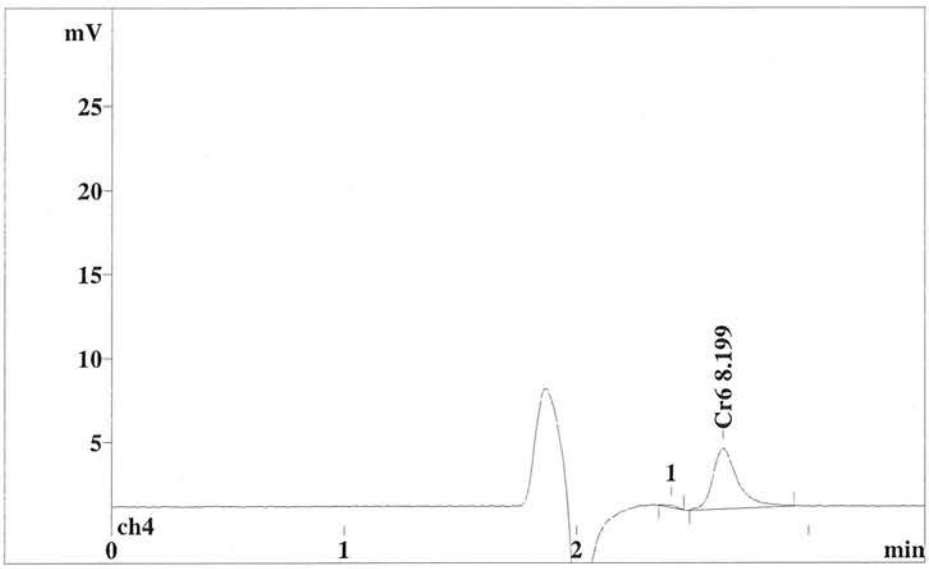
Method: stl_hexchrome_soil.mtw Last save: 12/12/2012 12:53:
Run operator: TestAmerica - Edison
Analysis number: 40077

SAMPLE: 100ul loop
:
Vial number: 22
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000

COLUMN: A Supp 5-150
Size: 4.6 x 150 mm
Number:
Part.size: 7.0 µm

ELUENT: 66 g (NH4)SO4 / 13ml NH4OH-2L DI

Flow: 0.75 mL/min
Temperature: 25.0°C
Pressure: 9.1 MPa



Matrix Spike
Calculation check

No;	Retention; min;	Width/2; min;	Height; mV;	Height; %;	Area; mV*sec;	Area; %;	K'; ;	Resolution; n,n+1;	
1;	2.63;	0.106;	3.61;	96.12;	27.206;	98.30;	0.00;	0.00;	27

Area
27.206 = 8.20 mg/L (excel L-Regression)

$$\frac{8.20\,mg}{L} \times \frac{0.1\,L}{2.5\,g} = \frac{0.328\,mg/g}{0.41\,\%Solid} = \frac{400\,mg/kg}{1730\,mg/kg} = 23\%$$

Target

TC
2/5/13

Report date: 12/13/2012 9:33:44 AM
Printed by: TestAmerica - Edison

Ident: 480-29484-B-14-A PDS@40
Analysis from: 12/12/2012 3:28:30 PM
File: wc121528.chw Last save: 12/12/2012 3:32:00 PM

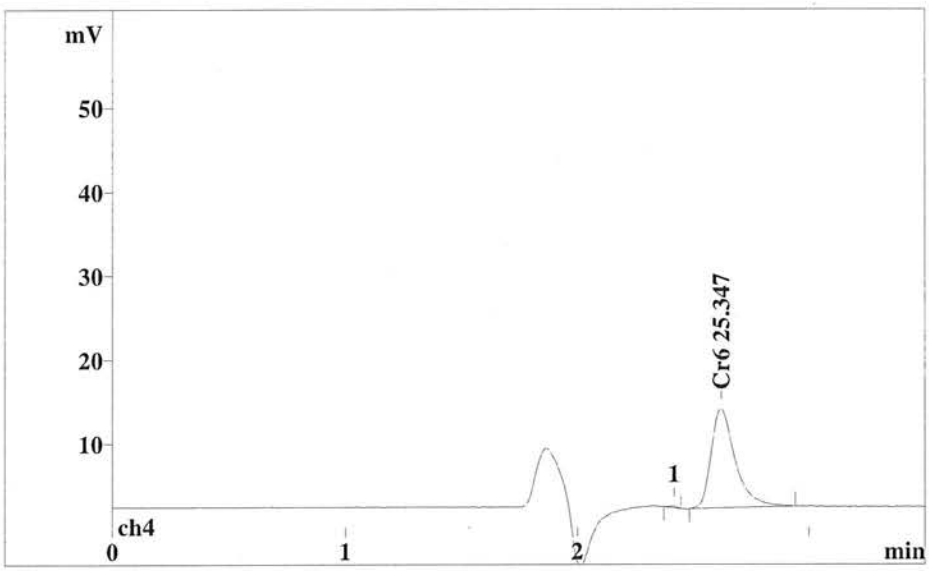
Method: stl_hexchrome_soil.mtw Last save: 12/12/2012 12:53:
Run operator: TestAmerica - Edison
Analysis number: 40079

SAMPLE: 100ul loop
:
Vial number: 24
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000

COLUMN: A Supp 5-150
Size: 4.6 x 150 mm
Number:
Part.size: 7.0 µm

ELUENT: 66 g (NH4)SO4 / 13ml NH4OH-2L DI

Flow: 0.75 mL/min
Temperature: 25.0°C
Pressure: 9.0 MPa



No;	Retention; min;	Width/2; min;	Height; mV;	Height; %;	Area; mV*sec;	Area; %;	K'; ;	Resolution; n,n+1;	
1;	2.62;	0.106;	11.83;	98.47;	86.164;	99.53;	0.00;	0.00;	29

Post Digestion Spike Calculation check

Area = 86.16

$\frac{25.3 mg}{L} \times 40 \times .1L = 101.2 ug/g$ 103% Recovery

Target 97.6 ug/g

2/5/13
TC

Report date: 12/13/2012 9:33:54 AM
Printed by: TestAmerica - Edison

Ident: 480-29484-B-1-A@10
Analysis from: 12/12/2012 3:53:36 PM
File: wc121553.chw Last save: 12/12/2012 3:57:07 PM

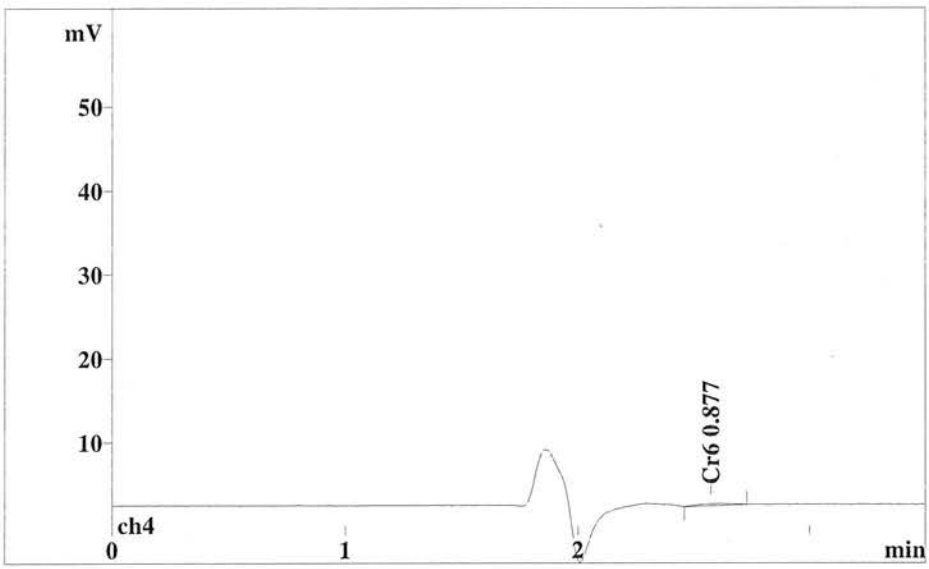
Method: stl_hexchrome_soil.mtw Last save: 12/12/2012 12:53:
Run operator: TestAmerica - Edison
Analysis number: 40082

SAMPLE: 100ul loop
:
Vial number: 27
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000

COLUMN: A Supp 5-150
Size: 4.6 x 150 mm
Number:
Part.size: 7.0 µm

ELUENT: 66 g (NH4)SO4 / 13ml NH4OH-2L DI

Flow: 0.75 mL/min
Temperature: 25.0°C
Pressure: 9.0 MPa



No;	Retention; min;	Width/2; min;	Height; mV;	Height; %;	Area; mV*sec;	Area; %;	K'; ;	Resolution; n,n+1;	
1;	2.57;	0.137;	0.24;	98.02;	2.032;	100.00;	0.00;	0.00;	21

Sample Result ND

TC
2/5/13

Report date: 12/13/2012 9:33:57 AM
Printed by: TestAmerica - Edison

Ident: 480-29484-B-2-A@10
Analysis from: 12/12/2012 4:01:57 PM
File: wc121601.chw Last save: 12/12/2012 4:05:27 PM

Method: stl_hexchrome_soil.mtw Last save: 12/12/2012 12:53:
Run operator: TestAmerica - Edison
Analysis number: 40083

SAMPLE: 100ul loop
:
Vial number: 28
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000

COLUMN: A Supp 5-150
Size: 4.6 x 150 mm
Number:
Part.size: 7.0 µm

ELUENT: 66 g (NH4)SO4 / 13ml NH4OH-2L DI

Flow: 0.75 mL/min
Temperature: 25.0°C
Pressure: 9.1 MPa

No;	Retention; min;	Width/2; min;	Height; mV;	Height; %;	Area; mV*sec;	Area; %;	K'; ;	Resolution; n,n+1;	
1;	2.60;	0.144;	0.20;	98.46;	1.581;	100.00;	0.00;	0.00;	24

Sample Result ND

TC 2/5/13

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Dilution Log
Wet Chemistry

Method No.: 7199
Prep Batch: 138391
Analytical Batch: 139567

Analyst: Sarah Braun
Analysis Date: 12/12/12

Job/Sample Number	Dilution Factor	Sample Volume (ml)	Final Volume (ml)	Diluent
MB	10	5	50	DI H_2O
LCSS	25	2	50	↓
LCSI	500	(5→50) 1	50	↓
480-29484-14	10	5	50	↓
480-29484-14 DU	10	5	50	↓
480-29484-14 MSS	40	1.25	50	↓
480-29484-14 MSI	500	(5→50) 1	50	↓
480-29484-14 PDS	40	1.25	50	↓
480-29484-1	10	5	50	↓
480-29484-2	10	5	50	↓
480-29484-3	10	5	50	↓
480-29484-4	10	5	50	↓
480-29484-5	10	5	50	↓
480-29484-6	10	5	50	↓
480-29484-7	10	5	50	↓
480-29484-8	10	5	50	↓
480-29484-9	10	5	50	↓
480-29484-10	10	5	50	↓
480-29484-11	10	5	50	↓
480-29484-12	10	5	50	↓
480-29484-13	10	5	50	↓
480-29484-15	10	5	50	↓
450-8103-21	10	5	50	↓
450-8054-1	10	5	50	↓

EDS-WI-101, Rev 0
05/24/11

TC
2/5/13

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 #: 6107130016-10 SDG #: 480-29598-1

LAB #: TAL-Buffalo

Sample IDs: Attach tracking sheet and/or sample listing.

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	reporting Limits for ND @ 20X (ok J)
Holding Times and Preservation				for SB-528 0.0/1.0 SB-528 1.0/3.0
☑	☐	☐	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				Not in QAPP
☑	☐	☐	%RSD less than or equal to 30%	ICV 12/18/12 @ 15:10 Not Qualified
☑	☐	☐	RRF greater than or equal to 0.05	nnitrosodiphenylamine -50 Pentachlorophenol 54
Continuing Calibration				Benzyl Alcohol -34.3 Benzoic Acid -30
☐	☑	☐	%D less than or equal to 25%	2,4 Dimethylphenol -31 2,6-Dinitrotoluene -52
☑	☐	☐	RRF greater than or equal to 0.05.	2,4 Dinitrophenol -42 4 Nitrophenol -35
Blank Contamination				Evaluate all blanks for contamination. Highest contaminant level used for action level.
☑	☐	☐	Method blank contamination TICs reported	
☐	☐	☑	Equipment/Rinseate blank contamination ↳ not collected	
Surrogate Recoveries				CCV 18 12/18/12 1653 w/ in Limits

*

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)	
☑	☐	☐	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	LCS 480-95170 (OKV) Benzyl Alcohol 0% Benzoic Acid 1% 4 Nitrophenol 0% LCSD 480 95170/3 Benzyl Alcohol 0% 4 Nitrophenol 0% Benzoic Acid 3% Reject these in All 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%)	
			Field Duplicates	Not Collected
☐	☐	☑	RPD criteria met (soils <50%, water <30%)	
			Internal Standard	All OK except PRY in sample (OKV) OC-SB-528-0.0/1.0-YYX out high Qualify estimated: Benzo b fluoranthene, Benzo (k) Fluoranthene, Benzo a Pyrene, Dibenz(a,h)anthracene, Indeno 123 cd pyrene, Benzo(g h i)perylene
☐	☑	☐	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	

Not Submitted

Validator's Signature: [signature]

Date: 5/13/13

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.

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-526-0.0/1.0-XXX**

Lab Sample ID: 480-29598-3
Client Matrix: Solid
% Moisture: 41.6

Date Sampled: 12/05/2012 1040
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3146.D
Dilution:	1.0			Initial Weight/Volume:	000030.5 g
Analysis Date:	12/18/2012 1835			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		ND		17	56
1,2-Dichlorobenzene		ND		17	56
1,3-Dichlorobenzene		ND		17	56
Benzaldehyde		56		17	56
1,4-Dichlorobenzene		ND		17	56
2,2'-oxybis[1-chloropropane]		ND		17	56
2,4,5-Trichlorophenol		ND		19	56
2,4,6-Trichlorophenol		ND		24	56
Benzyl alcohol		~~ND~~ R		17	110
2,4-Dichlorophenol		ND		17	56
2,4-Dimethylphenol		ND		17	56
2,4-Dinitrophenol		ND		45	56
2,4-Dinitrotoluene		ND		17	56
4-Nitroaniline		ND		47	280
2,6-Dinitrotoluene		ND		47	56
2-Chloronaphthalene		ND		17	56
2-Chlorophenol		ND		17	56
N-Nitrosodiphenylamine		ND		17	56
2-Methylnaphthalene		ND		17	56
2-Methylphenol		ND		17	56
2-Nitrophenol		ND		22	56
3 & 4 Methylphenol		ND		17	56
3,3'-Dichlorobenzidine		ND		20	110
2-Nitroaniline		ND		71	280
4-Bromophenyl phenyl ether		ND		17	56
Hexachlorocyclopentadiene		ND		17	110
4-Chloroaniline		ND		50	110
4-Nitrophenol		~~ND~~ R		24	280
Acenaphthene		ND		17	56
4,6-Dinitro-2-methylphenol		ND		54	280
1,2,4,5-Tetrachlorobenzene		ND		17	56
Acenaphthylene		ND		17	56
Acetophenone		ND		17	56
Aniline		ND		17	56
Anthracene		ND		17	56
Atrazine		ND		17	56
Azobenzene		ND		17	56
Benzo[a]anthracene		ND		17	56
Benzo[a]pyrene		ND		17	56
Benzo[b]fluoranthene		ND		17	56
Benzo[g,h,i]perylene		ND		17	56
Caprolactam		ND		17	56
3-Nitroaniline		ND		17	280
Benzo[k]fluoranthene		ND		29	56
Bis(2-chloroethoxy)methane		ND		17	56
1,1'-Biphenyl		ND		17	56

TC 3/6/15

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-526-0.0/1.0-XXX**

Lab Sample ID: 480-29598-3

Client Matrix: Solid

% Moisture: 41.6

Date Sampled: 12/05/2012 1040

Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3146.D
Dilution:	1.0			Initial Weight/Volume:	000030.5 g
Analysis Date:	12/18/2012 1835			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-chloroethyl)ether		ND		17	56
Bis(2-ethylhexyl) phthalate		ND		110	280
Butyl benzyl phthalate		ND		17	56
Chrysene		ND		17	56
N-Nitrosodi-n-propylamine		ND		17	56
Benzoic acid		~~ND~~ R		25	280
Dibenz(a,h)anthracene		ND		17	56
Dibenzofuran		ND		17	56
Diethyl phthalate		ND		19	56
Dimethyl phthalate		ND		17	56
Di-n-butyl phthalate		ND		84	280
Di-n-octyl phthalate		ND		17	56
Phenyl ether		ND		17	56
2,3,4,6-Tetrachlorophenol		ND		17	56
Fluoranthene		ND		17	56
4-Chloro-3-methylphenol		ND		17	110
Fluorene		ND		17	56
4-Chlorophenyl phenyl ether		ND		17	56
Hexachlorobenzene		ND		17	56
Hexachlorobutadiene		ND		17	56
Hexachloroethane		ND		17	56
Indeno[1,2,3-cd]pyrene		ND	i	17	56
Isophorone		ND		17	56
Naphthalene		ND		17	56
Nitrobenzene		ND		17	56
Pentachlorophenol		ND		17	56
Phenanthrene		ND		17	56
Benzophenone		ND		17	56
Phenol		ND		17	56
Pyrene		ND		17	56
N-Nitrosodimethylamine		ND		17	56
Carbazole		ND		17	56
1-Methylnaphthalene		ND		17	56
4-Methylphenol		ND		17	56

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	59		30 - 130
2-Fluorophenol	54		30 - 130
Nitrobenzene-d5	55		30 - 130
Phenol-d5	65		30 - 130
2-Fluorobiphenyl	60		30 - 130
p-Terphenyl-d14	55		30 - 130

TC 3/21/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-526-0.0/1.0-XXX**

Lab Sample ID: 480-29598-3
Client Matrix: Solid
% Moisture: 41.6

Date Sampled: 12/05/2012 1040
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3146.D
Dilution:	1.0			Initial Weight/Volume:	000030.5 g
Analysis Date:	12/18/2012 1835			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 10

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
~~141-79-7~~	~~3-Penten-2-one, 4-methyl-~~	~~3.56~~	~~150~~	~~T J N~~
~~4161-60-8~~	~~2-Pentanone, 4-hydroxy-~~	~~3.85~~	~~130~~	~~T J N~~
98-1-1	Furfural	4.08	420	~~T~~ J N
~~123-42-2~~	~~2-Pentanone, 4-hydroxy-4-methyl-~~	~~4.23~~	~~11000~~	~~T J N~~
~~106-42-3~~	~~p-Xylene~~	~~4.66~~	~~850~~	~~T J N~~
57-10-3	n-Hexadecanoic acid	13.76	110	~~T~~ J N
629-92-5	Nonadecane	16.11	100	~~T~~ J N
638-67-5	Tricosane	16.66	210	~~T~~ J N
630-4-6	Hentriacontane	17.27	190	~~T~~ J N
1000193-60-8	1,1,4a-Trimethyl-5,6-dimethylenedecahydr	18.45	150	~~T~~ J N

TC
3/19/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-526-1.0/3.0-XXX**

Lab Sample ID: 480-29598-4

Client Matrix: Solid

% Moisture: 25.1

Date Sampled: 12/05/2012 1045

Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3147.D
Dilution:	1.0			Initial Weight/Volume:	000030.5 g
Analysis Date:	12/18/2012 1900			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		ND		13	44
1,2-Dichlorobenzene		ND		13	44
1,3-Dichlorobenzene		ND		13	44
Benzaldehyde		ND		13	44
1,4-Dichlorobenzene		ND		13	44
2,2'-oxybis[1-chloropropane]		ND		13	44
2,4,5-Trichlorophenol		ND		14	44
2,4,6-Trichlorophenol		ND		18	44
Benzyl alcohol		~~ND~~ R		13	88
2,4-Dichlorophenol		ND		13	44
2,4-Dimethylphenol		ND		13	44
2,4-Dinitrophenol		ND		35	44
2,4-Dinitrotoluene		ND		13	44
4-Nitroaniline		ND		37	220
2,6-Dinitrotoluene		ND		37	44
2-Chloronaphthalene		ND		13	44
2-Chlorophenol		ND		13	44
N-Nitrosodiphenylamine		ND		13	44
2-Methylnaphthalene		ND		13	44
2-Methylphenol		ND		13	44
2-Nitrophenol		ND		17	44
3 & 4 Methylphenol		ND		13	44
3,3'-Dichlorobenzidine		ND		16	88
2-Nitroaniline		ND		55	220
4-Bromophenyl phenyl ether		ND		13	44
Hexachlorocyclopentadiene		ND		13	88
4-Chloroaniline		ND		39	88
4-Nitrophenol		~~ND~~ R		18	220
Acenaphthene		ND		13	44
4,6-Dinitro-2-methylphenol		ND		42	220
1,2,4,5-Tetrachlorobenzene		ND		13	44
Acenaphthylene		ND		13	44
Acetophenone		ND		13	44
Aniline		ND		13	44
Anthracene		ND		13	44
Atrazine		ND		13	44
Azobenzene		ND		13	44
Benzo[a]anthracene		ND		13	44
Benzo[a]pyrene		ND		13	44
Benzo[b]fluoranthene		ND		13	44
Benzo[g,h,i]perylene		ND		13	44
Caprolactam		ND		13	44
3-Nitroaniline		ND		13	220
Benzo[k]fluoranthene		ND		22	44
Bis(2-chloroethoxy)methane		ND		13	44
1,1'-Biphenyl		ND		13	44

TC 3/21/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-526-1.0/3.0-XXX**

Lab Sample ID: 480-29598-4
Client Matrix: Solid
% Moisture: 25.1

Date Sampled: 12/05/2012 1045
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3147.D
Dilution:	1.0			Initial Weight/Volume:	000030.5 g
Analysis Date:	12/18/2012 1900			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-chloroethyl)ether		ND		13	44
Bis(2-ethylhexyl) phthalate		ND		88	220
Butyl benzyl phthalate		ND		13	44
Chrysene		ND		13	44
N-Nitrosodi-n-propylamine		ND		13	44
Benzoic acid		~~ND~~ R		20	220
Dibenz(a,h)anthracene		ND		13	44
Dibenzofuran		ND		13	44
Diethyl phthalate		ND		14	44
Dimethyl phthalate		ND		13	44
Di-n-butyl phthalate		ND		66	220
Di-n-octyl phthalate		ND		13	44
Phenyl ether		ND		13	44
2,3,4,6-Tetrachlorophenol		ND		13	44
Fluoranthene		ND		13	44
4-Chloro-3-methylphenol		ND		13	88
Fluorene		ND		13	44
4-Chlorophenyl phenyl ether		ND		13	44
Hexachlorobenzene		ND		13	44
Hexachlorobutadiene		ND		13	44
Hexachloroethane		ND		13	44
Indeno[1,2,3-cd]pyrene		ND	1	13	44
Isophorone		ND		13	44
Naphthalene		ND		13	44
Nitrobenzene		ND		13	44
Pentachlorophenol		ND		13	44
Phenanthrene		ND		13	44
Benzophenone		ND		13	44
Phenol		ND		13	44
Pyrene		ND		13	44
N-Nitrosodimethylamine		ND		13	44
Carbazole		ND		13	44
1-Methylnaphthalene		ND		13	44
4-Methylphenol		ND		13	44

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	62		30 - 130
2-Fluorophenol	53		30 - 130
Nitrobenzene-d5	51		30 - 130
Phenol-d5	54		30 - 130
2-Fluorobiphenyl	66		30 - 130
p-Terphenyl-d14	67		30 - 130

TC
3/21/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-526-1.0/3.0-XXX**

Lab Sample ID: 480-29598-4
Client Matrix: Solid
% Moisture: 25.1

Date Sampled: 12/05/2012 1045
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3147.D
Dilution:	1.0			Initial Weight/Volume:	000030.5 g
Analysis Date:	12/18/2012 1900			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 7

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
~~4161-60-8~~	~~2-Pentanone, 4-hydroxy-~~	~~3.82~~	~~190~~	~~T J N~~
~~17429-4-8~~	~~2-Pentanone, 5-methoxy-~~	~~4.20~~	~~9800~~	~~T J N~~
	~~Unknown~~	~~4.21~~	~~54~~	~~T J~~
~~40499-83-0~~	~~3-Pyrrolidinol~~	~~5.23~~	~~37~~	~~T J N~~
~~111-84-2~~	~~Nonane~~	~~6.32~~	~~22~~	~~T J N~~
~~89950-0-5~~	~~d:a-Friedoursan-3-one~~	~~15.28~~	~~280~~	~~T J N~~
593-49-7	Heptacosane	16.66	23	~~T~~ J N

TC
3/19/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-528-0.0/1.0-XXX**

Lab Sample ID: 480-29598-7
Client Matrix: Solid
% Moisture: 73.0

Date Sampled: 12/05/2012 1400
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3148.D
Dilution:	20			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/18/2012 1926			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		ND R		730	2400
1,2-Dichlorobenzene		ND		730	2400
1,3-Dichlorobenzene		ND		730	2400
Benzaldehyde		ND		730	2400
1,4-Dichlorobenzene		ND		730	2400
2,2'-oxybis[1-chloropropane]		ND		730	2400
2,4,5-Trichlorophenol		ND		800	2400
2,4,6-Trichlorophenol		ND		1000	2400
Benzyl alcohol		ND		730	4800
2,4-Dichlorophenol		ND		730	2400
2,4-Dimethylphenol		ND		730	2400
2,4-Dinitrophenol		ND		2000	2400
2,4-Dinitrotoluene		ND		730	2400
4-Nitroaniline		ND		2000	12000
2,6-Dinitrotoluene		ND		2000	2400
2-Chloronaphthalene		ND		730	2400
2-Chlorophenol		ND		730	2400
N-Nitrosodiphenylamine		1300	J	730	2400
2-Methylnaphthalene		ND R		730	2400
2-Methylphenol		ND		730	2400
2-Nitrophenol		ND		940	2400
3 & 4 Methylphenol		ND		730	2400
3,3'-Dichlorobenzidine		ND		870	4800
2-Nitroaniline		ND		3100	12000
4-Bromophenyl phenyl ether		ND		730	2400
Hexachlorocyclopentadiene		ND		730	4800
4-Chloroaniline		ND		2200	4800
4-Nitrophenol		ND		1000	12000
Acenaphthene		ND		730	2400
4,6-Dinitro-2-methylphenol		ND		2300	12000
1,2,4,5-Tetrachlorobenzene		ND		730	2400
Acenaphthylene		ND		730	2400
Acetophenone		ND		730	2400
Aniline		ND		730	2400
Anthracene		ND		730	2400
Atrazine		ND		730	2400
Azobenzene		ND		730	2400
Benzo[a]anthracene		ND		730	2400
Benzo[a]pyrene		ND		730	2400
Benzo[b]fluoranthene		ND		730	2400
Benzo[g,h,i]perylene		ND		730	2400
Caprolactam		ND		730	2400
3-Nitroaniline		ND		730	12000
Benzo[k]fluoranthene		ND		1200	2400
Bis(2-chloroethoxy)methane		ND		730	2400
1,1'-Biphenyl		930	J	730	2400

TC 3/21/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-528-0.0/1.0-XXX**

Lab Sample ID: 480-29598-7
Client Matrix: Solid
% Moisture: 73.0

Date Sampled: 12/05/2012 1400
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3148.D
Dilution:	20			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/18/2012 1926			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-chloroethyl)ether		~~ND~~ R		730	2400
Bis(2-ethylhexyl) phthalate		41000 J		4900	12000
Butyl benzyl phthalate		~~ND~~ R		730	2400
Chrysene		~~ND~~		730	2400
N-Nitrosodi-n-propylamine		~~ND~~		730	2400
Benzoic acid		~~ND~~		1100	12000
Dibenz(a,h)anthracene		~~ND~~		730	2400
Dibenzofuran		~~ND~~		730	2400
Diethyl phthalate		~~ND~~		800	2400
Dimethyl phthalate		~~ND~~		730	2400
Di-n-butyl phthalate		~~ND~~		3600	12000
Di-n-octyl phthalate		~~ND~~		730	2400
Phenyl ether		1900	J	730	2400
2,3,4,6-Tetrachlorophenol		~~ND~~ R		730	2400
Fluoranthene		~~ND~~		730	2400
4-Chloro-3-methylphenol		~~ND~~		730	4800
Fluorene		~~ND~~		730	2400
4-Chlorophenyl phenyl ether		~~ND~~		730	2400
Hexachlorobenzene		~~ND~~		730	2400
Hexachlorobutadiene		~~ND~~		730	2400
Hexachloroethane		~~ND~~		730	2400
Indeno[1,2,3-cd]pyrene		~~ND~~		730	2400
Isophorone		~~ND~~		730	2400
Naphthalene		~~ND~~		730	2400
Nitrobenzene		~~ND~~		730	2400
Pentachlorophenol		~~ND~~		730	2400
Phenanthrene		~~ND~~		730	2400
Benzophenone		~~ND~~		730	2400
Phenol		~~ND~~		730	2400
Pyrene		~~ND~~		730	2400
N-Nitrosodimethylamine		~~ND~~		730	2400
Carbazole		~~ND~~		730	2400
1-Methylnaphthalene		~~ND~~		730	2400
4-Methylphenol		~~ND~~		730	2400

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

TC
3/21/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-528-0.0/1.0-XXX**

Lab Sample ID: 480-29598-7

Client Matrix: Solid

% Moisture: 73.0

Date Sampled: 12/05/2012 1400

Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3148.D
Dilution:	20			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/18/2012 1926			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
540-88-5	Acetic acid, 1,1-dimethylethyl ester	4.14	42000	~~T~~ J N
123-48-8	3-Heptene, 2,2,4,6,6-pentamethyl-	9.61	79000	~~T~~ J N
7756-94-7	1-Propene, 2-methyl-, trimer	9.67	5100	~~T~~ J N
4390-4-9	Nonane, 2,2,4,4,6,8,8-heptamethyl-	9.72	46000	~~T~~ J N
123-48-8	3-Heptene, 2,2,4,6,6-pentamethyl-	9.77	6100	~~T~~ J N
107-39-1	1-Pentene, 2,4,4-trimethyl-	9.82	30000	~~T~~ J N
23069-75-2	1,2,4-Triazolo[4,3-b]pyridazine, 8-methy	11.99	7800	~~T~~ J N
1000126-4-1	Styrene, 2-nitro-3'-[4-methylphenyloxy]-	15.94	15000	~~T~~ J N
~~77862-13-6~~	~~9,10-Anthracenedione, 1,4-bis(aminomethy~~	~~16.04~~	~~30000~~	~~T J N~~
1000126-4-1	Styrene, 2-nitro-3'-[4-methylphenyloxy]-	16.17	7700	~~T~~ J N

TC
3/19/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-528-1.0/3.0-XXX**

Lab Sample ID: 480-29598-8

Client Matrix: Solid

% Moisture: 59.0

Date Sampled: 12/05/2012 1405

Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3149.D
Dilution:	20			Initial Weight/Volume:	000030.8 g
Analysis Date:	12/18/2012 1951			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		ND		480	1600
1,2-Dichlorobenzene		ND		480	1600
1,3-Dichlorobenzene		ND		480	1600
Benzaldehyde		ND		480	1600
1,4-Dichlorobenzene		ND		480	1600
2,2'-oxybis[1-chloropropane]		ND		480	1600
2,4,5-Trichlorophenol		ND		520	1600
2,4,6-Trichlorophenol		ND		670	1600
Benzyl alcohol		~~ND~~ R		480	3200
2,4-Dichlorophenol		ND		480	1600
2,4-Dimethylphenol		ND		480	1600
2,4-Dinitrophenol		ND		1300	1600
2,4-Dinitrotoluene		ND		480	1600
4-Nitroaniline		ND		1300	7900
2,6-Dinitrotoluene		ND		1300	1600
2-Chloronaphthalene		ND		480	1600
2-Chlorophenol		ND		480	1600
N-Nitrosodiphenylamine		ND		480	1600
2-Methylnaphthalene		ND		480	1600
2-Methylphenol		ND		480	1600
2-Nitrophenol		ND		620	1600
3 & 4 Methylphenol		ND		480	1600
3,3'-Dichlorobenzidine		ND		570	3200
2-Nitroaniline		ND		2000	7900
4-Bromophenyl phenyl ether		ND		480	1600
Hexachlorocyclopentadiene		ND		480	3200
4-Chloroaniline		ND		1400	3200
4-Nitrophenol		~~ND~~ R		670	7900
Acenaphthene		ND		480	1600
4,6-Dinitro-2-methylphenol		ND		1500	7900
1,2,4,5-Tetrachlorobenzene		ND		480	1600
Acenaphthylene		ND		480	1600
Acetophenone		ND		480	1600
Aniline		ND		480	1600
Anthracene		ND		480	1600
Atrazine		ND		480	1600
Azobenzene		ND		480	1600
Benzo[a]anthracene		ND		480	1600
Benzo[a]pyrene		ND		480	1600
Benzo[b]fluoranthene		ND		480	1600
Benzo[g,h,i]perylene		ND		480	1600
Caprolactam		ND		480	1600
3-Nitroaniline		ND		480	7900
Benzo[k]fluoranthene		ND		810	1600
Bis(2-chloroethoxy)methane		ND		480	1600
1,1'-Biphenyl		ND		480	1600

TC 3/4/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-528-1.0/3.0-XXX**

Lab Sample ID: 480-29598-8
Client Matrix: Solid
% Moisture: 59.0

Date Sampled: 12/05/2012 1405
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3149.D
Dilution:	20			Initial Weight/Volume:	000030.8 g
Analysis Date:	12/18/2012 1951			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-chloroethyl)ether		ND		480	1600
Bis(2-ethylhexyl) phthalate		11000		3200	7900
Butyl benzyl phthalate		ND		480	1600
Chrysene		ND		480	1600
N-Nitrosodi-n-propylamine		ND		480	1600
Benzoic acid		~~ND~~ R		710	7900
Dibenz(a,h)anthracene		ND		480	1600
Dibenzofuran		ND		480	1600
Diethyl phthalate		ND		520	1600
Dimethyl phthalate		ND		480	1600
Di-n-butyl phthalate		ND		2400	7900
Di-n-octyl phthalate		ND		480	1600
Phenyl ether		820	J	480	1600
2,3,4,6-Tetrachlorophenol		ND		480	1600
Fluoranthene		ND		480	1600
4-Chloro-3-methylphenol		ND		480	3200
Fluorene		ND		480	1600
4-Chlorophenyl phenyl ether		ND		480	1600
Hexachlorobenzene		ND		480	1600
Hexachlorobutadiene		ND		480	1600
Hexachloroethane		ND		480	1600
Indeno[1,2,3-cd]pyrene		ND		480	1600
Isophorone		ND		480	1600
Naphthalene		ND		480	1600
Nitrobenzene		ND		480	1600
Pentachlorophenol		ND		480	1600
Phenanthrene		ND		480	1600
Benzophenone		ND		480	1600
Phenol		ND		480	1600
Pyrene		ND		480	1600
N-Nitrosodimethylamine		ND		480	1600
Carbazole		ND		480	1600
1-Methylnaphthalene		ND		480	1600
4-Methylphenol		ND		480	1600

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

TC
3/21/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-528-1.0/3.0-XXX**

Lab Sample ID: 480-29598-8
Client Matrix: Solid
% Moisture: 59.0

Date Sampled: 12/05/2012 1405
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3149.D
Dilution:	20			Initial Weight/Volume:	000030.8 g
Analysis Date:	12/18/2012 1951			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 5

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
~~123-42-2~~	~~2-Pentanone, 4-hydroxy-4-methyl-~~	~~4.15~~	~~29000~~	~~T J N~~
123-48-8	3-Heptene, 2,2,4,6,6-pentamethyl-	9.61	26000	~~T~~ J N
4390-4-9	Nonane, 2,2,4,4,6,8,8-heptamethyl-	9.73	15000	~~T~~ J N
STET OK ~~313-87-1~~	8H-Dinaphtho[2,3-c:2',3'-g]carbazole	18.12	820	~~T~~ J N
~~22611-26-3~~	~~D:C-Friedoolean-8-en-3-one~~	~~18.78~~	~~830~~	~~T J N~~

TC
3/19/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-529-0.0/1.0-XXX**

Lab Sample ID: 480-29598-9
Client Matrix: Solid
% Moisture: 40.6

Date Sampled: 12/05/2012 1230
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3150.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/18/2012 2016			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		ND		17	56
1,2-Dichlorobenzene		ND		17	56
1,3-Dichlorobenzene		ND		17	56
Benzaldehyde		97		17	56
1,4-Dichlorobenzene		ND		17	56
2,2'-oxybis[1-chloropropane]		ND		17	56
2,4,5-Trichlorophenol		ND		18	56
2,4,6-Trichlorophenol		ND		23	56
Benzyl alcohol		~~ND~~ R		17	110
2,4-Dichlorophenol		ND		17	56
2,4-Dimethylphenol		ND		17	56
2,4-Dinitrophenol		ND		45	56
2,4-Dinitrotoluene		ND		17	56
4-Nitroaniline		ND		47	280
2,6-Dinitrotoluene		ND		47	56
2-Chloronaphthalene		ND		17	56
2-Chlorophenol		ND		17	56
N-Nitrosodiphenylamine		ND		17	56
2-Methylnaphthalene		ND		17	56
2-Methylphenol		ND		17	56
2-Nitrophenol		ND		22	56
3 & 4 Methylphenol		ND		17	56
3,3'-Dichlorobenzidine		ND		20	110
2-Nitroaniline		ND		70	280
4-Bromophenyl phenyl ether		ND		17	56
Hexachlorocyclopentadiene		ND		17	110
4-Chloroaniline		ND		50	110
4-Nitrophenol		~~ND~~ R		23	280
Acenaphthene		ND		17	56
4,6-Dinitro-2-methylphenol		ND		54	280
1,2,4,5-Tetrachlorobenzene		ND		17	56
Acenaphthylene		ND		17	56
Acetophenone		18	J	17	56
Aniline		ND		17	56
Anthracene		ND		17	56
Atrazine		ND		17	56
Azobenzene		ND		17	56
Benzo[a]anthracene		ND		17	56
Benzo[a]pyrene		ND		17	56
Benzo[b]fluoranthene		ND		17	56
Benzo[g,h,i]perylene		ND		17	56
Caprolactam		ND		17	56
3-Nitroaniline		ND		17	280
Benzo[k]fluoranthene		ND		29	56
Bis(2-chloroethoxy)methane		ND		17	56
1,1'-Biphenyl		ND		17	56

TC
3/21/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-529-0.0/1.0-XXX**

Lab Sample ID: 480-29598-9
Client Matrix: Solid
% Moisture: 40.6

Date Sampled: 12/05/2012 1230
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3150.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/18/2012 2016			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-chloroethyl)ether		ND		17	56
Bis(2-ethylhexyl) phthalate		ND		110	280
Butyl benzyl phthalate		ND		17	56
Chrysene		ND		17	56
N-Nitrosodi-n-propylamine		ND		17	56
Benzoic acid		~~ND~~ R		25	280
Dibenz(a,h)anthracene		ND		17	56
Dibenzofuran		ND		17	56
Diethyl phthalate		ND		18	56
Dimethyl phthalate		ND		17	56
Di-n-butyl phthalate		ND		84	280
Di-n-octyl phthalate		ND		17	56
Phenyl ether		ND		17	56
2,3,4,6-Tetrachlorophenol		ND		17	56
Fluoranthene		18	J	17	56
4-Chloro-3-methylphenol		ND		17	110
Fluorene		ND		17	56
4-Chlorophenyl phenyl ether		ND		17	56
Hexachlorobenzene		ND		17	56
Hexachlorobutadiene		ND		17	56
Hexachloroethane		ND		17	56
Indeno[1,2,3-cd]pyrene		ND		17	56
Isophorone		ND		17	56
Naphthalene		26	J	17	56
Nitrobenzene		ND		17	56
Pentachlorophenol		ND		17	56
Phenanthrene		23	J	17	56
Benzophenone		ND		17	56
Phenol		24	J	17	56
Pyrene		ND		17	56
N-Nitrosodimethylamine		ND		17	56
Carbazole		ND		17	56
1-Methylnaphthalene		ND		17	56
4-Methylphenol		ND		17	56

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	71		30 - 130
2-Fluorophenol	59		30 - 130
Nitrobenzene-d5	60		30 - 130
Phenol-d5	83		30 - 130
2-Fluorobiphenyl	68		30 - 130
p-Terphenyl-d14	63		30 - 130

TC
3/21/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-529-0.0/1.0-XXX**

Lab Sample ID: 480-29598-9
Client Matrix: Solid
% Moisture: 40.6

Date Sampled: 12/05/2012 1230
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3150.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/18/2012 2016			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
~~498-60-2~~	~~3-Furaldehyde~~	~~4.05~~	~~1000~~	~~T J N~~
~~17429-4-8~~	~~2-Pentanone, 5-methoxy-~~	~~4.20~~	~~7700~~	~~T J N~~
121-33-5	Vanillin	10.37	360	~~T~~ J N
121-34-6	Benzoic acid, 4-hydroxy-3-methoxy-	11.67	620	~~T~~ J N
~~57-10-3~~	~~n-Hexadecanoic acid~~	~~13.77~~	~~810~~	~~T J N~~
~~112-79-8~~	~~9-Octadecenoic acid, (E)-~~	~~14.47~~	~~590~~	~~T J N~~
630-3-5	Nonacosane	16.67	1300	~~T~~ J N
77899-10-6	(Z)14-Tricosenyl formate	17.11	520	~~T~~ J N
630-4-6	Hentriacontane	17.28	1100	~~T~~ J N
1000158-8-0	.beta.-Humulene	18.77	360	~~T~~ J N

TC
3/19/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-529-1.0/3.0-XXX**

Lab Sample ID: 480-29598-10
Client Matrix: Solid
% Moisture: 20.8

Date Sampled: 12/05/2012 1235
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3151.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/18/2012 2042			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		ND		13	42
1,2-Dichlorobenzene		ND		13	42
1,3-Dichlorobenzene		ND		13	42
Benzaldehyde		ND		13	42
1,4-Dichlorobenzene		ND		13	42
2,2'-oxybis[1-chloropropane]		ND		13	42
2,4,5-Trichlorophenol		ND		14	42
2,4,6-Trichlorophenol		ND		18	42
Benzyl alcohol		~~ND~~ R		13	84
2,4-Dichlorophenol		ND		13	42
2,4-Dimethylphenol		ND		13	42
2,4-Dinitrophenol		ND		34	42
2,4-Dinitrotoluene		ND		13	42
4-Nitroaniline		ND		35	210
2,6-Dinitrotoluene		ND		35	42
2-Chloronaphthalene		ND		13	42
2-Chlorophenol		ND		13	42
N-Nitrosodiphenylamine		ND		13	42
2-Methylnaphthalene		ND		13	42
2-Methylphenol		ND		13	42
2-Nitrophenol		ND		16	42
3 & 4 Methylphenol		ND		13	42
3,3'-Dichlorobenzidine		ND		15	84
2-Nitroaniline		ND		53	210
4-Bromophenyl phenyl ether		ND		13	42
Hexachlorocyclopentadiene		ND		13	84
4-Chloroaniline		ND		38	84
4-Nitrophenol		~~ND~~ R		18	210
Acenaphthene		ND		13	42
4,6-Dinitro-2-methylphenol		ND		40	210
1,2,4,5-Tetrachlorobenzene		ND		13	42
Acenaphthylene		ND		13	42
Acetophenone		ND		13	42
Aniline		ND		13	42
Anthracene		ND		13	42
Atrazine		ND		13	42
Azobenzene		ND		13	42
Benzo[a]anthracene		ND		13	42
Benzo[a]pyrene		ND		13	42
Benzo[b]fluoranthene		ND		13	42
Benzo[g,h,i]perylene		ND		13	42
Caprolactam		ND		13	42
3-Nitroaniline		ND		13	210
Benzo[k]fluoranthene		ND		21	42
Bis(2-chloroethoxy)methane		ND		13	42
1,1'-Biphenyl		ND		13	42

TC 3/21/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-529-1.0/3.0-XXX**

Lab Sample ID: 480-29598-10
Client Matrix: Solid
% Moisture: 20.8

Date Sampled: 12/05/2012 1235
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3151.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/18/2012 2042			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-chloroethyl)ether		ND		13	42
Bis(2-ethylhexyl) phthalate		ND		84	210
Butyl benzyl phthalate		ND		13	42
Chrysene		ND		13	42
N-Nitrosodi-n-propylamine		ND		13	42
Benzoic acid		~~ND~~ R		19	210
Dibenz(a,h)anthracene		ND		13	42
Dibenzofuran		ND		13	42
Diethyl phthalate		ND		14	42
Dimethyl phthalate		ND		13	42
Di-n-butyl phthalate		ND		63	210
Di-n-octyl phthalate		ND		13	42
Phenyl ether		ND		13	42
2,3,4,6-Tetrachlorophenol		ND		13	42
Fluoranthene		ND		13	42
4-Chloro-3-methylphenol		ND		13	84
Fluorene		ND		13	42
4-Chlorophenyl phenyl ether		ND		13	42
Hexachlorobenzene		ND		13	42
Hexachlorobutadiene		ND		13	42
Hexachloroethane		ND		13	42
Indeno[1,2,3-cd]pyrene		ND		13	42
Isophorone		ND		13	42
Naphthalene		ND		13	42
Nitrobenzene		ND		13	42
Pentachlorophenol		ND		13	42
Phenanthrene		ND		13	42
Benzophenone		ND		13	42
Phenol		ND		13	42
Pyrene		ND		13	42
N-Nitrosodimethylamine		ND		13	42
Carbazole		ND		13	42
1-Methylnaphthalene		ND		13	42
4-Methylphenol		ND		13	42

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	63		30 - 130
2-Fluorophenol	53		30 - 130
Nitrobenzene-d5	53		30 - 130
Phenol-d5	48		30 - 130
2-Fluorobiphenyl	57		30 - 130
p-Terphenyl-d14	71		30 - 130

TC
3/21/13

Client: Olin Corporation

Job Number: 480-29598-1

Client Sample ID: **OC-SB-529-1.0/3.0-XXX**

Lab Sample ID: 480-29598-10
Client Matrix: Solid
% Moisture: 20.8

Date Sampled: 12/05/2012 1235
Date Received: 12/05/2012 1815

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96347	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-95170	Lab File ID:	X3151.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/18/2012 2042			Final Weight/Volume:	1 mL
Prep Date:	12/11/2012 0851			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 10

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
~~828-0-2~~	~~Dimethoxane~~	~~3.82~~	~~180~~	~~T J N~~
~~17429-4-8~~	~~2-Pentanone, 5-methoxy-~~	~~4.20~~	~~9600~~	~~T J N~~
~~42779-8-8~~	~~Octane, 1-(ethenylthio)-~~	~~4.22~~	~~43~~	~~T J N~~
~~40499-83-0~~	~~3-Pyrrolidinol~~	~~5.23~~	~~51~~	~~T J N~~
57-10-3	n-Hexadecanoic acid	13.76	98	T J N
~~37643-19-9~~	~~Cyclopropylidene-3,3-dimethylcyclohex-5-~~	~~15.29~~	~~390~~	~~T J N~~
6765-39-5	1-Heptadecene	16.31	97	T J N
111-2-4	2,6,10,14,18,22-Tetracosahexaene, 2,6,10	16.46	46	T J N
3386-33-2	Octadecane, 1-chloro-	16.67	36	T J N
~~1000151-99-7~~	~~Cycloisolongifolene~~	~~18.47~~	~~47~~	~~T J N~~

TC
3/19/13

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

Lab Name: TestAmerica Buffalo
Job No.: 480-29598-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 480-95170/1-A
Matrix: Solid
Lab File ID: X3143.D
Analysis Method: 8270D
Date Collected:
Extract. Method: 3546
Date Extracted: 12/11/2012 08:50
Sample wt/vol: 000030.8(g)
Date Analyzed: 12/18/2012 17:19
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.: 96347
Units: ug/Kg
Number TICs Found: 9
TIC Result Total: 12520.9

CAS NO.	COMPOUND NAME	RT	RESULT	Q
141-79-7	3-Penten-2-one, 4-methyl-	3.55	62.0	T J N
4161-60-8	2-Pentanone, 4-hydroxy-	3.85	286	T J N
123-42-2	2-Pentanone, 4-hydroxy-4-methyl-	4.24	11000	T J N
108-38-3	Benzene, 1,3-dimethyl-	4.65	601	T J N
53951-43-2	1,3-Dioxolane-2-methanol, 2,4-dimethyl-	5.25	49.9	T J N
124-18-5	Decane	6.34	25.3	T J N
55429-13-5	Benzeneethanamine, N-[(pentafluorophenyl	7.78	22.7	T J N
31158-91-5	Hexadecanoic acid, 1,1-dimethylethyl est	14.63	198	T J N
123-95-5	Octadecanoic acid, butyl ester	15.27	276	T J N

TIC's Method Blank

3/13/13
TC

~~VOLATILE~~/SEMIVOLATILE ORGANICS

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

TIER III

SITE: Olin Wilmington Project #: 6/07/30016-10 SDG #: 480-29598-1

LAB #: TAL-Buffalo

Sample IDs: Attach tracking sheet and/or sample listing.

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.	Tier 3 calculation check performed in SDG 480-30406-1 on 12/18/12 Line instrument HP5973 X
☑	☐	☐	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

Yes	No	N/A		
☐	☐	☑	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.	Not Provided by Lab
☑	☐	☐	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.	Not Provided by Lab
(Tc) ☑	☐	☑	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).	Not Provided by Lab
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	

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REGION I VALIDATION CHECKLIST for OLIN CHEMICAL SUPERFUND SITE

Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER III

Yes	No	N/A		
			calibration range.	
☐	☐	☑	Verify from the raw GPC data that a GPC instrument blank was analyzed after the GPC calibration and prior to sample analysis.	Not Provided
☐	☐	☑	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.
☐	☐	☑	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.	
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	

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

TIER III

Yes	No	N/A		
			sample.	
MDL Study				
☑	☐	☐	Check and recalculate the %RSD and % recoveries for at least three compounds per MDL study.	Checked as part of Review SDG 480-30406-1 Verify that the recalculated values agree within 10% of the laboratory reported values.
☐	☐	☑	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.	Not provided by lab
☐	☐	☑	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. Raw data not provided
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	

No PES samples collected

Yes	No	N/A		
			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.	
☑	☐	☐	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.	
☑	☐	☐	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.	Peaks of TIC's in blanks present and same compounds removed from samples
☑	☐	☐	Examine all TIC mass spectra in every sample and blank.	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

Yes	No	N/A	TIER III	
☑	☐	☐	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)				
☐	☐	☑	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				
☐	☐	☐	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				
☐	☐	☑	Evaluate all PES and other relevant QC data to determine if any analytical trends exist over the sample analysis period.	
☐	☐	☑	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	

N/A

				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.
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.
	☑	☐	☐	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

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

TIER III

Yes	No	N/A		
			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.	
☑	☐	☐	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: Trish Lee

Date: 3/21/13

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.

DATA VALIDATION MDL STUDY REVIEW
OLIN OU1 Soil November/December 2012

Analyte	Units	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	MDL9	Average	Standard Deviation	*MDL (T*SD)	MDL reported by the lab
Bis(2-Ethylhexyl)phthalate	µg/Kg	198	212	192	175	218	173	192			194.28571	16.957931	53.299	53

* = **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
Is Spike Conc. > 10x MDL?	N	Y = failure

Report Date: 09-Mar-2013 09:11:22 Chrom Revision: 2.0 01-Feb-2013 10:03:10
Data File: \\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3148.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
40 Isophorone	82		7.764					9
41 2-Nitrophenol	139		7.873					
43 2,4-Dimethylphenol	107		7.987					9
45 Bis(2-chloroethoxy)methane	93		8.111					19
44 Benzoic acid	105		8.168					149
47 2,4-Dichlorophenol	162		8.268					
48 1,2,4-Trichlorobenzene	180		8.348					
49 Naphthalene	128		8.458					9
51 4-Chloroaniline	127		8.586					
52 Hexachlorobutadiene	225		8.653					
54 Caprolactam	113		9.114					
55 4-Chloro-3-methylphenol	107		9.371					1
56 2-Methylnaphthalene	142		9.495					9
57 1-Methylnaphthalene	142		9.637					
58 Hexachlorocyclopentadiene	237		9.728					
59 1,2,4,5-Tetrachlorobenzene	216		9.747					149
60 2,4,6-Trichlorophenol	196		9.951					
61 2,4,5-Trichlorophenol	196		10.037					
62 1,1'-Biphenyl	154	10.274	10.198	0.076	48	52312	0.3828	M
63 2-Chloronaphthalene	162		10.241					9
64 Phenyl ether	170	10.417	10.360	0.057	81	58952	0.7933	M
65 2-Nitroaniline	65		10.417					
67 Dimethyl phthalate	163		10.693					
68 2,6-Dinitrotoluene	165		10.783					
69 Acenaphthylene	152		10.821					
70 3-Nitroaniline	138		11.045					
71 Acenaphthene	153		11.083					
72 2,4-Dinitrophenol	184		11.211					149
73 Dibenzofuran	168		11.349					
74 2,4-Dinitrotoluene	165		11.387					
75 4-Nitrophenol	109		11.421					
76 2,3,4,6-Tetrachlorophenol	232		11.563					
78 Diethyl phthalate	149		11.744					9
79 Fluorene	166		11.853					
80 4-Chlorophenyl phenyl ether	204		11.868					
81 4-Nitroaniline	138		11.953					
82 4,6-Dinitro-2-methylphenol	198		11.982					
83 N-Nitrosodiphenylamine	169	12.105	12.048	0.057	83	95556	0.5219	
16 1,2-Diphenylhydrazine	77		12.086					
85 Azobenzene	77		12.086					
86 Benzophenone	105		12.110					
89 4-Bromophenyl phenyl ether	248		12.519					
91 Hexachlorobenzene	284		12.581					9
93 Atrazine	200		12.771					
94 Pentachlorophenol	266		12.852					
97 Phenanthrene	178		13.080					
98 Anthracene	178		13.142					
99 Carbazole	167		13.351					
102 Di-n-butyl phthalate	149	13.770	13.741	0.029	77	107847	0.5614	
104 Fluoranthene	202		14.364					
106 Pyrene	202		14.588					
108 Butyl benzyl phthalate	149		15.196					9

cal check done

3/18/13

 TC

Report Date: 09-Mar-2013 09:11:22 Chrom Revision: 2.0 01-Feb-2013 10:03:10
Data File: \\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3148.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
109 3,3'-Dichlorobenzidine	252		15.691					
110 Bis(2-ethylhexyl) phthalate	149	15.701	15.696	0.005	94	2438355	17.0	
111 Benzo[a]anthracene	228		15.705					
112 Chrysene	228		15.743					
113 Di-n-octyl phthalate	149		16.238					
114 Benzo[b]fluoranthene	252		16.647					
115 Benzo[k]fluoranthene	252		16.666					
116 Benzo[a]pyrene	252		16.951					
117 Indeno[1,2,3-cd]pyrene	276		18.093					
118 Dibenz(a,h)anthracene	278		18.093					
119 Benzo[g,h,i]perylene	276		18.411					
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
s - Failed ISTD Recovery Test

Review Flags
M - Manually Integrated

Calculation check

BEHP $1.0199 = \frac{2438355\,(5)}{702580\,(x)} = \frac{17.01\,ng}{mL} \times \frac{1000\,mL}{30.6\,g} \times \frac{1}{.27}$

$\frac{2058.8\,ng}{g} \times 20 =$

41176 ng/kg ✓ dry

Phenyl ether $0.7862 = \frac{58952\,(5)}{472638\,(x)} = 0.7932 \times \frac{1000\,mL}{30.6\,g} \times \frac{1}{.27} =$

$96.01 \times 20 = 1920$ ng/kg ✓

TC 3/18/13

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Tier 3 Sample ✓

Lab Name: TestAmerica Buffalo | Job No.: 480-29598-1

SDG No.:

Client Sample ID: OC-SB-529-0.0/1.0-XXX | Lab Sample ID: 480-29598-9

Matrix: Solid | Lab File ID: X3150.D

Analysis Method: 8270D | Date Collected: 12/05/2012 12:30

Extract. Method: 3546 | Date Extracted: 12/11/2012 08:51

Sample wt/vol: 000030.1(g) | Date Analyzed: 12/18/2012 20:16

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

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

% Moisture: 40.6 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 96347 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	ND		56	17
95-50-1	1,2-Dichlorobenzene	ND		56	17
541-73-1	1,3-Dichlorobenzene	ND		56	17
100-52-7	Benzaldehyde	97		56	17
106-46-7	1,4-Dichlorobenzene	ND		56	17
108-60-1	2,2'-oxybis[1-chloropropane]	ND		56	17
95-95-4	2,4,5-Trichlorophenol	ND		56	18
88-06-2	2,4,6-Trichlorophenol	ND		56	23
100-51-6	Benzyl alcohol	ND		110	17
120-83-2	2,4-Dichlorophenol	ND		56	17
105-67-9	2,4-Dimethylphenol	ND		56	17
51-28-5	2,4-Dinitrophenol	ND	*	56	45
121-14-2	2,4-Dinitrotoluene	ND		56	17
100-01-6	4-Nitroaniline	ND		280	47
606-20-2	2,6-Dinitrotoluene	ND		56	47
91-58-7	2-Chloronaphthalene	ND	*	56	17
95-57-8	2-Chlorophenol	ND		56	17
86-30-6	N-Nitrosodiphenylamine	ND		56	17
91-57-6	2-Methylnaphthalene	ND		56	17
95-48-7	2-Methylphenol	ND		56	17
88-75-5	2-Nitrophenol	ND		56	22
15831-10-4	3 & 4 Methylphenol	ND		56	17
91-94-1	3,3'-Dichlorobenzidine	ND		110	20
88-74-4	2-Nitroaniline	ND		280	70
101-55-3	4-Bromophenyl phenyl ether	ND		56	17
77-47-4	Hexachlorocyclopentadiene	ND		110	17
106-47-8	4-Chloroaniline	ND		110	50
100-02-7	4-Nitrophenol	ND	*	280	23
83-32-9	Acenaphthene	ND		56	17
534-52-1	4,6-Dinitro-2-methylphenol	ND		280	54
95-94-3	1,2,4,5-Tetrachlorobenzene	ND		56	17
208-96-8	Acenaphthylene	ND		56	17
98-86-2	Acetophenone	18	J	56	17
62-53-3	Aniline	ND		56	17

3/18/13 TC

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-29598-1
SDG No.:
Client Sample ID: OC-SB-529-0.0/1.0-XXX
Lab Sample ID: 480-29598-9
Matrix: Solid
Lab File ID: X3150.D
Analysis Method: 8270D
Date Collected: 12/05/2012 12:30
Extract. Method: 3546
Date Extracted: 12/11/2012 08:51
Sample wt/vol: 000030.1(g)
Date Analyzed: 12/18/2012 20:16
Con. Extract Vol.: 1(mL)
Dilution Factor: 1
Injection Volume: 1(uL)
Level: (low/med) Low
% Moisture: 40.6
GPC Cleanup:(Y/N) N
Analysis Batch No.: 96347
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
120-12-7	Anthracene	ND		56	17
1912-24-9	Atrazine	ND		56	17
103-33-3	Azobenzene	ND		56	17
56-55-3	Benzo[a]anthracene	ND		56	17
50-32-8	Benzo[a]pyrene	ND		56	17
205-99-2	Benzo[b]fluoranthene	ND		56	17
191-24-2	Benzo[g,h,i]perylene	ND		56	17
105-60-2	Caprolactam	ND		56	17
99-09-2	3-Nitroaniline	ND		280	17
207-08-9	Benzo[k]fluoranthene	ND		56	29
111-91-1	Bis(2-chloroethoxy)methane	ND		56	17
92-52-4	1,1'-Biphenyl	ND		56	17
111-44-4	Bis(2-chloroethyl)ether	ND		56	17
117-81-7	Bis(2-ethylhexyl) phthalate	ND		280	110
85-68-7	Butyl benzyl phthalate	ND		56	17
218-01-9	Chrysene	ND		56	17
621-64-7	N-Nitrosodi-n-propylamine	ND		56	17
65-85-0	Benzoic acid	ND		280	25
53-70-3	Dibenz(a,h)anthracene	ND		56	17
132-64-9	Dibenzofuran	ND		56	17
84-66-2	Diethyl phthalate	ND		56	18
131-11-3	Dimethyl phthalate	ND		56	17
84-74-2	Di-n-butyl phthalate	ND		280	84
117-84-0	Di-n-octyl phthalate	ND		56	17
101-84-8	Phenyl ether	ND		56	17
58-90-2	2,3,4,6-Tetrachlorophenol	ND		56	17
206-44-0	Fluoranthene	18	J	56	17
59-50-7	4-Chloro-3-methylphenol	ND		110	17
86-73-7	Fluorene	ND		56	17
7005-72-3	4-Chlorophenyl phenyl ether	ND		56	17
118-74-1	Hexachlorobenzene	ND		56	17
87-68-3	Hexachlorobutadiene	ND		56	17
67-72-1	Hexachloroethane	ND		56	17
193-39-5	Indeno[1,2,3-cd]pyrene	ND	*	56	17

3/18/13
TC

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-29598-1

SDG No.:

Client Sample ID: OC-SB-529-0.0/1.0-XXX | Lab Sample ID: 480-29598-9

Matrix: Solid | Lab File ID: X3150.D

Analysis Method: 8270D | Date Collected: 12/05/2012 12:30

Extract. Method: 3546 | Date Extracted: 12/11/2012 08:51

Sample wt/vol: 000030.1(g) | Date Analyzed: 12/18/2012 20:16

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

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

% Moisture: 40.6 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 96347 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
78-59-1	Isophorone	ND		56	17
91-20-3	Naphthalene	26	J	56	17
98-95-3	Nitrobenzene	ND		56	17
87-86-5	Pentachlorophenol	ND		56	17
85-01-8	Phenanthrene	23	J	56	17
119-61-9	Benzophenone	ND		56	17
108-95-2	Phenol	24	J	56	17
129-00-0	Pyrene	ND		56	17
62-75-9	N-Nitrosodimethylamine	ND		56	17
86-74-8	Carbazole	ND		56	17
90-12-0	1-Methylnaphthalene	ND		56	17
106-44-5	4-Methylphenol	ND		56	17

CAS NO.	SURROGATE	%REC	Q	LIMITS
118-79-6	2,4,6-Tribromophenol	71		30-130
367-12-4	2-Fluorophenol	59		30-130
4165-60-0	Nitrobenzene-d5	60		30-130
4165-62-2	Phenol-d5	83		30-130
321-60-8	2-Fluorobiphenyl	68		30-130
1718-51-0	p-Terphenyl-d14	63		30-130

3/18/13
TC

Report Date: 09-Mar-2013 09:11:26 Chrom Revision: 2.0 01-Feb-2013 10:03:10

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3150.D		
Lims ID:	480-29598-B-9-A	Client ID:	OC-SB-529-0.0/1.0-XXX
Inject. Date:	18-Dec-2012 20:16:30	Dil. Factor:	1.0000
Sample Type:	Client		
Sample ID:	480-0017654-021		
Misc. Info.:			
Operator:	ANM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	22
Lims Batch ID:	96347	Lims Sample ID:	21
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X-8270LL.m		
Last Update:	09-Mar-2013 09:11:13	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: 19-Dec-2012 09:28:14

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.541	6.537	0.004	78	232393	5.00	
* 2 Naphthalene-d8	136	8.458	8.425	0.033	97	904086	5.00	
* 3 Acenaphthene-d10	164	11.088	11.035	0.053	90	540648	5.00	
* 4 Phenanthrene-d10	188	13.099	13.052	0.047	96	857612	5.00	
* 5 Chrysene-d12	240	15.739	15.720	0.019	97	663564	5.00	
* 6 Perylene-d12	264	17.008	17.004	0.004	96	863043	5.00	
$ 7 2-Fluorophenol	112	4.658	4.672	-0.014	2	62202	1.18	
$ 8 Phenol-d5	99	6.094	6.061	0.033	76	106910	1.67	M
$ 9 Nitrobenzene-d5	82	7.393	7.374	0.019	82	81596	1.20	
$ 10 2-Fluorobiphenyl	172	10.108	10.056	0.052	87	184858	1.36	
$ 11 2,4,6-Tribromophenol	330	12.253	12.196	0.057	17	22464	1.42	
$ 12 p-Terphenyl-d14	244	14.768	14.740	0.028	96	162351	1.27	
19 N-Nitrosodimethylamine	42		2.918					
21 Benzaldehyde	77	5.904	5.909	-0.005	87	78727	1.73	
23 Aniline	93		6.071					
22 Phenol	94	6.109	6.080	0.029	0	30997	0.4379	M
24 Bis(2-chloroethyl)ether	93		6.170					
25 2-Chlorophenol	128		6.237					19
26 1,3-Dichlorobenzene	146		6.451					
27 1,4-Dichlorobenzene	146		6.565					
28 Benzyl alcohol	108		6.774					
29 1,2-Dichlorobenzene	146		6.784					9
31 2-Methylphenol	108		6.965					
32 2,2'-oxybis[1-chloropropane]	45		6.979					
33 Acetophenone	105	7.164	7.155	0.009	70	27895	0.3237	
34 N-Nitrosodi-n-propylamine	70		7.164					
35 DFTPP								
36 4-Methylphenol	108		7.212					
37 Hexachloroethane	117		7.274					19
38 Nitrobenzene	77		7.402					

Surrogate check

$1.13 = \frac{62202(5)}{232393(X)}$

$X = 1.18$

59%

$.9641 = \frac{162351(5)}{663564(X)}$

1.268

$0.98 = \frac{78727(5)}{232393(X)} = 1.728 \times \frac{1000}{30.1} \times \frac{1}{.594}$

96.6 ug/kg

3/18/13

 TC

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
40 Isophorone	82		7.764					
41 2-Nitrophenol	139		7.873					
43 2,4-Dimethylphenol	107		7.987					9
45 Bis(2-chloroethoxy)methane	93		8.111					
44 Benzoic acid	105		8.168					
47 2,4-Dichlorophenol	162		8.268					9
48 1,2,4-Trichlorobenzene	180		8.348					
49 Naphthalene	128	8.486	8.458	0.028	53	92751	0.4631	
51 4-Chloroaniline	127		8.586					
52 Hexachlorobutadiene	225		8.653					9
54 Caprolactam	113		9.114					
55 4-Chloro-3-methylphenol	107		9.371					
56 2-Methylnaphthalene	142	9.542	9.495	0.047	39	28684	0.2043	
57 1-Methylnaphthalene	142	9.689	9.637	0.052	40	22734	0.1758	
58 Hexachlorocyclopentadiene	237		9.728					
59 1,2,4,5-Tetrachlorobenzene	216		9.747					
60 2,4,6-Trichlorophenol	196		9.951					19
61 2,4,5-Trichlorophenol	196		10.037					19
62 1,1'-Biphenyl	154	10.251	10.198	0.053	47	14164	0.0906	
63 2-Chloronaphthalene	162		10.241					
64 Phenyl ether	170		10.360					
65 2-Nitroaniline	65		10.417					
67 Dimethyl phthalate	163		10.693					9
68 2,6-Dinitrotoluene	165		10.783					
69 Acenaphthylene	152		10.821					
70 3-Nitroaniline	138		11.045					
71 Acenaphthene	153		11.083					
72 2,4-Dinitrophenol	184		11.211					
73 Dibenzofuran	168	11.411	11.349	0.062	68	18380	0.1144	
74 2,4-Dinitrotoluene	165		11.387					
75 4-Nitrophenol	109		11.421					
76 2,3,4,6-Tetrachlorophenol	232		11.563					
78 Diethyl phthalate	149		11.744					9
79 Fluorene	166		11.853					
80 4-Chlorophenyl phenyl ether	204		11.868					
81 4-Nitroaniline	138		11.953					
82 4,6-Dinitro-2-methylphenol	198		11.982					
83 N-Nitrosodiphenylamine	169		12.048					
16 1,2-Diphenylhydrazine	77		12.086					
85 Azobenzene	77		12.086					
86 Benzophenone	105		12.110					
89 4-Bromophenyl phenyl ether	248		12.519					19
91 Hexachlorobenzene	284		12.581					9
93 Atrazine	200		12.771					
94 Pentachlorophenol	266		12.852					
97 Phenanthrene	178	13.123	13.080	0.043	67	77385	0.4048	
98 Anthracene	178		13.142					
99 Carbazole	167		13.351					
102 Di-n-butyl phthalate	149		13.741					9
104 Fluoranthene	202	14.402	14.364	0.038	52	62420	0.3298	
106 Pyrene	202	14.626	14.588	0.038	86	45973	0.2586	
108 Butyl benzyl phthalate	149		15.196					

Naphthalene

$1.1076 = \frac{92751(5)}{904086\ (X)} = 0.463 \times \frac{1000}{30.1} \times \frac{1}{.594} =$ 25.9 ug/kg

Fluoranthene

$1.1035 = \frac{62420(5)}{857612(X)} = 0.3297 \times \frac{1000}{30.1} \times \frac{1}{.594}$

18.44 ug/kg

TC 3/18/13

FORM I

GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-29598-1

SDG No.:

Client Sample ID: OC-SB-526-0.0/1.0-XXX | Lab Sample ID: 480-29598-3

Matrix: Solid | Lab File ID: X3146.D

Analysis Method: 8270D | Date Collected: 12/05/2012 10:40

Extract. Method: 3546 | Date Extracted: 12/11/2012 08:51

Sample wt/vol: 000030.5(g) | Date Analyzed: 12/18/2012 18:35

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

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

% Moisture: 41.6 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 96347 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	ND		56	17
95-50-1	1,2-Dichlorobenzene	ND		56	17
541-73-1	1,3-Dichlorobenzene	ND		56	17
100-52-7	Benzaldehyde	56		56	17
106-46-7	1,4-Dichlorobenzene	ND		56	17
108-60-1	2,2'-oxybis[1-chloropropane]	ND		56	17
95-95-4	2,4,5-Trichlorophenol	ND		56	19
88-06-2	2,4,6-Trichlorophenol	ND		56	24
100-51-6	Benzyl alcohol	ND		110	17
120-83-2	2,4-Dichlorophenol	ND		56	17
105-67-9	2,4-Dimethylphenol	ND		56	17
51-28-5	2,4-Dinitrophenol	ND	*	56	45
121-14-2	2,4-Dinitrotoluene	ND		56	17
100-01-6	4-Nitroaniline	ND		280	47
606-20-2	2,6-Dinitrotoluene	ND		56	47
91-58-7	2-Chloronaphthalene	ND	*	56	17
95-57-8	2-Chlorophenol	ND		56	17
86-30-6	N-Nitrosodiphenylamine	ND		56	17
91-57-6	2-Methylnaphthalene	ND		56	17
95-48-7	2-Methylphenol	ND		56	17
88-75-5	2-Nitrophenol	ND		56	22
15831-10-4	3 & 4 Methylphenol	ND		56	17
91-94-1	3,3'-Dichlorobenzidine	ND		110	20
88-74-4	2-Nitroaniline	ND		280	71
101-55-3	4-Bromophenyl phenyl ether	ND		56	17
77-47-4	Hexachlorocyclopentadiene	ND		110	17
106-47-8	4-Chloroaniline	ND		110	50
100-02-7	4-Nitrophenol	ND	*	280	24
83-32-9	Acenaphthene	ND		56	17
534-52-1	4,6-Dinitro-2-methylphenol	ND		280	54
95-94-3	1,2,4,5-Tetrachlorobenzene	ND		56	17
208-96-8	Acenaphthylene	ND		56	17
98-86-2	Acetophenone	ND		56	17
62-53-3	Aniline	ND		56	17

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3146.D		
Lims ID:	480-29598-B-3-A	Client ID:	OC-SB-526-0.0/1.0-XXX
Inject. Date:	18-Dec-2012 18:35:30	Dil. Factor:	1.0000
Sample Type:	Client		
Sample ID:	480-0017654-017		
Misc. Info.:			
Operator:	ANM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	18
Lims Batch ID:	96347	Lims Sample ID:	17
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X-8270LL.m		
Last Update:	09-Mar-2013 09:11:13	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: 19-Dec-2012 09:03:19

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.565	6.537	0.028	87	234566	5.00	
* 2 Naphthalene-d8	136	8.467	8.425	0.042	98	834281	5.00	
* 3 Acenaphthene-d10	164	11.112	11.035	0.077	87	485513	5.00	
* 4 Phenanthrene-d10	188	13.099	13.052	0.047	96	766786	5.00	
* 5 Chrysene-d12	240	15.729	15.720	0.009	92	631025	5.00	
* 6 Perylene-d12	264	17.004	17.004	0.0	98	647449	5.00	
$ 7 2-Fluorophenol	112	4.692	4.672	0.020	1	57011	1.07	M
$ 8 Phenol-d5	99	6.166	6.061	0.105	0	84357	1.30	M
$ 9 Nitrobenzene-d5	82	7.416	7.374	0.042	85	69130	1.11	M
$ 10 2-Fluorobiphenyl	172	10.127	10.056	0.071	89	145211	1.19	
$ 11 2,4,6-Tribromophenol	330	12.286	12.196	0.090	0	16756	1.19	M
$ 12 p-Terphenyl-d14	244	14.759	14.740	0.019	94	133262	1.10	
19 N-Nitrosodimethylamine	42		2.918					
21 Benzaldehyde	77	5.933	5.909	0.024	85	45520	0.99	
23 Aniline	93		6.071					
22 Phenol	94		6.080					9
24 Bis(2-chloroethyl)ether	93		6.170					
25 2-Chlorophenol	128		6.237					19
26 1,3-Dichlorobenzene	146		6.451					9
27 1,4-Dichlorobenzene	146		6.565					9
28 Benzyl alcohol	108		6.774					
29 1,2-Dichlorobenzene	146		6.784					
31 2-Methylphenol	108		6.965					9
32 2,2'-oxybis[1-chloropropane]	45		6.979					
33 Acetophenone	105	7.193	7.155	0.038	54	12936	0.1487	
34 N-Nitrosodi-n-propylamine	70		7.164					19
35 DFTPP								
36 4-Methylphenol	108		7.212					
37 Hexachloroethane	117		7.274					19
38 Nitrobenzene	77		7.402					

$0.98 = \frac{45520\,(5)}{234566\,(X)} = 0.990$

$\frac{0.990\,ug}{uL} \times \frac{1000}{30.5} \times \frac{1}{.584} = 55.5\,ug/kg$

3/18/13
TC

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Tier 3 checks

Lab Name: TestAmerica Buffalo Job No.: 480-29598-1

SDG No.:

Lab Sample ID: ICV 480-96347/11 Calibration Date: 12/18/2012 15:10

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: X3140.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,4-Dioxane	Lin1		0.4047			2000	-23.3	30.0
N-Nitrosodimethylamine	Ave	0.9135	0.8071	.9184/.9800 -1 = -0.0628		2000	-11.6	30.0
Pyridine	Ave	0.9276	0.9622			2000	3.7	20.0
Benzaldehyde	Ave	0.9800	0.9184	0.0100		2000	-6.3	30.0
Aniline	Ave	1.831	1.674		1610	2000	-8.6	20.0
Phenol	Ave	1.523	1.320	0.7000	1580	2000	-13.3	20.0
Bis(2-chloroethyl)ether	Ave	1.199	1.212	0.6000	1910	2000	1.1	20.0
2-Chlorophenol	Ave	1.295	1.305	0.8000	1840	2000	0.8	20.0
1,3-Dichlorobenzene	Ave	1.606	1.467		1720	2000	-8.7	20.0
1,4-Dichlorobenzene	Ave	1.604	1.690		1820	2000	5.3	20.0
1,2-Dichlorobenzene	Ave	1.496	1.507		1780	2000	0.8	20.0
Benzyl alcohol	QuaF		0.3325		1270	2000	-36.3*	30.0
2,2'-oxybis[1-chloropropane]	Ave	1.949	1.746	0.0100		2000	-10.4	20.0
2-Methylphenol	Ave	1.087	0.9038	0.6000	1550	2000	-16.8	20.0
Acetophenone	Ave	1.854	1.627	0.0100	1640	2000	-12.3	20.0
N-Nitrosodi-n-propylamine	Ave	0.9313	0.8720	0.0500		2000	-6.4	20.0
4-Methylphenol	Ave	1.101	1.107	0.6000	4250	4000	0.5	30.0
Hexachloroethane	Lin1		0.6078	0.3000		2000	-18.4	20.0
Nitrobenzene	Ave	0.3891	0.3767	0.1000	1760	2000	-3.2	20.0
Isophorone	Ave	0.6400	0.6591	0.3000	2060	2000	3.0	20.0
2-Nitrophenol	Ave	0.1771	0.1649	0.0500	1910	2000	-6.9	20.0
2,4-Dimethylphenol	Ave	0.3340	0.2304	0.1000	1330	2000	-31.0*	20.0
Bis(2-chloroethoxy)methane	Ave	0.3791	0.3611	0.2000	1860	2000	-4.7	20.0
2,4-Dichlorophenol	Ave	0.2718	0.2508	0.1000	1740	2000	-7.7	20.0
1,2,4-Trichlorobenzene	Ave	0.3341	0.3170	1.131/1.108 -1 = 0.0207	1920	2000	-5.1	20.0
Benzoic acid	QuaF		0.1598		1390	2000	-30.5*	30.0
Naphthalene	Ave	1.108	1.131	0.6000	1960	2000	2.1	20.0
4-Chloroaniline	Ave	0.4008	0.4278	0.0100	1950	1840	6.7	20.0
Hexachlorobutadiene	Ave	0.1826	0.1746	0.0100	1760	2000	-4.4	20.0
Caprolactam	Ave	0.0989	0.0932	0.0100		2000	-5.8	30.0
4-Chloro-3-methylphenol	Ave	0.3003	0.2880	0.2000	1660	2000	-4.1	20.0
2-Methylnaphthalene	Ave	0.7764	0.7254	0.4000	1830	2000	-6.6	20.0
1-Methylnaphthalene	Ave	0.7151	0.6983			2000	-2.4	20.0
Hexachlorocyclopentadiene	QuaF		0.1131	0.0500	2190	2000	9.7	20.0
2,4,6-Trichlorophenol	Ave	0.2887	0.2977	0.2000	2040	2000	3.1	20.0
2,4,5-Trichlorophenol	Ave	0.2793	0.3308	0.2000	2250	2000	18.4	20.0
1,1'-Biphenyl	Ave	1.446	1.475	0.0100		2000	2.1	30.0
2-Chloronaphthalene	Lin1		1.051	0.8000	1620	2000	-19.1	20.0
2-Nitroaniline	Ave	0.3311	0.3581	0.0100	2490	2000	8.1	20.0
Dimethyl phthalate	Ave	1.294	1.329	0.0100	1940	2000	2.7	20.0
2,6-Dinitrotoluene	Ave	0.5865	0.2796	0.1000	949	2000	-52.3*	20.0

FORM VII 8270D

3/18/13 TC

03/11/2013

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-29598-1

SDG No.:

Lab Sample ID: ICV 480-96347/11 Calibration Date: 12/18/2012 15:10

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: X3140.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Acenaphthylene	Ave	1.749	1.848	0.9000	1990	2000	5.7	20.0
Acenaphthene	Ave	1.218	1.148	0.9000	1890	2000	-5.7	20.0
3-Nitroaniline	Ave	0.2913	0.2495	0.0100	1640	1980	-14.4	20.0
2,4-Dinitrophenol	QuaF		0.0413	0.0100	1150	2000	-42.6*	20.0
Dibenzofuran	Ave	1.486	1.605	0.8000	1970	2000	8.0	20.0
2,4-Dinitrotoluene	Ave	0.3744	0.3550	0.2000	2150	2000	-5.2	20.0
2,3,4,6-Tetrachlorophenol	Ave	0.2247	0.2525	0.0100		2000	12.4	30.0
4-Nitrophenol	Ave	0.2503	0.1605	0.0500	1360	2000	-35.9*	20.0
Diethyl phthalate	Ave	1.417	1.413	0.0100	1870	2000	-0.3	20.0
Fluorene	Ave	1.359	1.362	0.8000	1900	2000	0.2	20.0
4-Chlorophenyl phenyl ether	Ave	0.6017	0.6275	0.4000	2170	2000	4.3	20.0
4-Nitroaniline	Lin1		0.2810	0.0100	1970	2000	-1.5	20.0
4,6-Dinitro-2-methylphenol	Lin1		0.1287	0.0100	2020	2000	0.9	20.0
N-Nitrosodiphenylamine	Ave	1.163	0.5793	0.0100	871	2000	-50.2*	20.0
1,2-Diphenylhydrazine	Ave	0.7515	0.7252		1850	2000	-3.5	30.0
4-Bromophenyl phenyl ether	Ave	0.1874	0.1618	0.1000	1650	2000	-13.7	20.0
Hexachlorobenzene	Lin1		0.1736	0.1000	1640	2000	-17.9	20.0
Atrazine	Ave	0.3761	0.3179	0.0100	1660	2000	-15.5	20.0
Pentachlorophenol	Lin1		0.0435*	0.0500	1320	2000	-34.2*	20.0
Phenanthrene	Ave	1.115	1.090	0.6000	1750	2000	-2.2	20.0
Anthracene	Ave	1.135	1.052	0.6000	1720	2000	-7.4	20.0
Carbazole	Ave	1.052	0.9783	0.0100		2000	-7.0	20.0
Di-n-butyl phthalate	Ave	1.220	1.216	0.0100	1720	2000	-0.3	20.0
Fluoranthene	Ave	1.104	1.069	0.6000	1760	2000	-3.1	20.0
Benzidine	Ave	0.5523	0.4752			2000	-14.0	20.0
Pyrene	Ave	1.340	1.289	0.6000	1890	2000	-3.8	20.0
Butyl benzyl phthalate	Ave	0.7409	0.6208	0.0100	1710	2000	-16.2	20.0
Bis(2-ethylhexyl) phthalate	Ave	1.020	0.9377	0.0100		2000	-8.1	20.0
3,3'-Dichlorobenzidine	Ave	0.4492	0.3890	0.0100	1670	1940	-13.4	20.0
Benzo[a]anthracene	Ave	1.077	0.9725	0.6000	1950	2000	-9.7	20.0
Chrysene	Ave	1.222	1.309	0.6000	2060	2000	7.1	20.0
Di-n-octyl phthalate	Ave	1.608	1.446	0.0100	1810	2000	-10.1	20.0
Benzo[b]fluoranthene	Ave	1.161	0.9264	0.7000	1630	2000	-20.2*	20.0
Benzo[k]fluoranthene	Ave	1.196	1.160	0.7000	1760	2000	-3.1	20.0
Benzo[a]pyrene	Ave	1.123	1.017	0.7000	1740	2000	-9.4	20.0
Dibenz(a,h)anthracene	Ave	1.017	0.9196	0.4000	1890	2000	-9.6	20.0
Indeno[1,2,3-cd]pyrene	Ave	1.198	1.111	0.5000	1990	2000	-7.3	20.0
Benzo[g,h,i]perylene	Ave	1.000	0.9806	0.4000	2200	2000	-1.9	20.0

Tier 3 checks $\frac{.9377}{1.02} - 1 = -0.0806$

3/18/13

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3140.D		
Lims ID:	ICV	Client ID:	
Inject. Date:	18-Dec-2012 15:10:30	Dil. Factor:	1.0000
Sample Type:	ICV		
Sample ID:	480-0017654-011		
Misc. Info.:			
Operator:	ANM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	12
Lims Batch ID:	96347	Lims Sample ID:	11
Sublist:			
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X-8270LL.m		
Last Update:	18-Dec-2012 16:43:20	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 16:43:25

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.537	6.580	-0.043	84	282864	5.00	
* 2 Naphthalene-d8	136	8.429	8.472	-0.043	97	1017248	5.00	
* 3 Acenaphthene-d10	164	11.083	11.107	-0.024	88	632460	5.00	
* 4 Phenanthrene-d10	188	13.109	13.123	-0.014	96	1146776	5.00	
* 5 Chrysene-d12	240	15.748	15.763	-0.015	96	1030518	5.00	
* 6 Perylene-d12	264	17.018	17.028	-0.010	98	967545	5.00	
18 1,4-Dioxane	88	2.418	2.461	-0.043	67	45786	1.53	
19 N-Nitrosodimethylamine	42	2.756	2.804	-0.048	62	91319	1.71	M
20 Pyridine	52	2.827	2.865	-0.038	81	108864	1.88	M
21 Benzaldehyde	77	5.899	5.942	-0.043	91	103911	1.59	
23 Aniline	93	6.066	6.109	-0.043	96	189385	1.61	
22 Phenol	94	6.085	6.123	-0.038	44	149335	1.58	
24 Bis(2-chloroethyl)ether	93	6.170	6.213	-0.043	95	137125	1.91	
25 2-Chlorophenol	128	6.237	6.280	-0.043	93	147660	1.84	
26 1,3-Dichlorobenzene	146	6.446	6.489	-0.043	95	165961	1.72	
27 1,4-Dichlorobenzene	146	6.565	6.608	-0.043	66	191180	1.82	
29 1,2-Dichlorobenzene	146	6.784	6.822	-0.038	78	170518	1.78	
28 Benzyl alcohol	108	6.784	6.822	-0.038	63	37623	1.27	M
31 2-Methylphenol	108	6.974	7.008	-0.034	65	102260	1.55	
32 2,2'-oxybis[1-chloropropane]	45	6.969	7.012	-0.043	75	197519	1.66	
33 Acetophenone	105	7.160	7.198	-0.038	85	184089	1.64	
34 N-Nitrosodi-n-propylamine	70	7.164	7.203	-0.039	92	98657	1.72	
36 4-Methylphenol	108	7.217	7.260	-0.043	79	250433	4.25	M
37 Hexachloroethane	117	7.274	7.317	-0.043	92	68774	1.63	
38 Nitrobenzene	77	7.407	7.445	-0.038	77	153275	1.76	
40 Isophorone	82	7.764	7.806	-0.042	74	268186	2.06	
41 2-Nitrophenol	139	7.882	7.921	-0.039	85	67089	1.91	
43 2,4-Dimethylphenol	107	8.020	8.040	-0.020	77	93752	1.33	
45 Bis(2-chloroethoxy)methane	93	8.120	8.154	-0.034	96	146943	1.86	

103911(5) / 282864(2) = RF=0.9183

3/18/13 tc

Report Date: 18-Dec-2012 16:43:26 Chrom Revision: 2.0 22-Oct-2012 16:30:48
Data File: \\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3140.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
44 Benzoic acid	105	8.358	8.225	0.133	1	65023	1.39	M
47 2,4-Dichlorophenol	162	8.315	8.315	0.0	0	102042	1.74	M
48 1,2,4-Trichlorobenzene	180	8.353	8.396	-0.043	88	128970	1.92	
49 Naphthalene	128	8.463	8.506	-0.043	89	460359	1.96	
51 4-Chloroaniline	127	8.610	8.634	-0.024	88	160136	1.95	M
52 Hexachlorobutadiene	225	8.653	8.701	-0.048	82	71038	1.76	
54 Caprolactam	113	9.162	9.167	-0.005	53	37931	1.59	M
55 4-Chloro-3-methylphenol	107	9.428	9.428	0.0	75	117178	1.66	M
56 2-Methylnaphthalene	142	9.514	9.547	-0.033	75	295180	1.83	
57 1-Methylnaphthalene	142	9.661	9.694	-0.033	95	284126	1.90	
58 Hexachlorocyclopentadiene	237	9.742	9.780	-0.038	52	28609	2.19	
60 2,4,6-Trichlorophenol	196	9.994	10.013	-0.019	71	75303	2.04	M
61 2,4,5-Trichlorophenol	196	10.118	10.108	0.010	61	83695	2.25	M
62 1,1'-Biphenyl	154	10.232	10.260	-0.028	96	373266	1.94	M
63 2-Chloronaphthalene	162	10.256	10.303	-0.047	85	265973	1.62	M
65 2-Nitroaniline	65	10.479	10.484	-0.005	77	90588	2.49	M
66 1,4-Dinitrobenzene	75	10.726	10.717	0.009	57	55306	0	M
67 Dimethyl phthalate	163	10.745	10.764	-0.019	88	336199	1.94	
68 2,6-Dinitrotoluene	165	10.845	10.850	-0.005	86	70734	0.9494	
69 Acenaphthylene	152	10.869	10.893	-0.024	75	467613	1.99	
70 3-Nitroaniline	138	11.145	11.126	0.019	94	62483	1.64	M
71 Acenaphthene	153	11.131	11.154	-0.023	89	290495	1.89	
72 2,4-Dinitrophenol	184	11.406	11.302	0.104	1	10459	1.15	M
73 Dibenzofuran	168	11.411	11.425	-0.014	97	405988	1.97	M
74 2,4-Dinitrotoluene	165	11.482	11.468	0.014	86	89819	2.15	M
75 4-Nitrophenol	109	11.673	11.521	0.152	1	40602	1.36	M
76 2,3,4,6-Tetrachlorophenol	232	11.663	11.649	0.014	58	63884	1.83	M
78 Diethyl phthalate	149	11.806	11.820	-0.014	92	357389	1.87	
79 Fluorene	166	11.910	11.930	-0.020	90	344481	1.90	
80 4-Chlorophenyl phenyl ether	204	11.929	11.944	-0.015	87	158752	2.17	
81 4-Nitroaniline	138	12.077	12.039	0.038	75	71078	1.97	M
82 4,6-Dinitro-2-methylphenol	198	12.086	12.063	0.023	47	32563	2.02	M
83 N-Nitrosodiphenylamine	169	12.110	12.120	-0.010	94	265709	0.8712	M
16 1,2-Diphenylhydrazine	77	12.148	12.163	-0.015	96	332656	1.85	
89 4-Bromophenyl phenyl ether	248	12.581	12.591	-0.010	86	74227	1.65	
91 Hexachlorobenzene	284	12.638	12.652	-0.014	71	79625	1.64	M
93 Atrazine	200	12.828	12.838	-0.010	80	80431	1.66	M
94 Pentachlorophenol	266	12.952	12.928	0.024	0	19958	1.32	M
97 Phenanthrene	178	13.137	13.152	-0.015	90	500138	1.75	
98 Anthracene	178	13.204	13.214	-0.010	94	482370	1.72	
99 Carbazole	167	13.427	13.418	0.009	96	448758	1.77	M
102 Di-n-butyl phthalate	149	13.794	13.803	-0.009	96	557918	1.72	
104 Fluoranthene	202	14.421	14.426	-0.005	96	490291	1.76	
105 Benzidine	184	14.597	14.593	0.004	94	195886	1.52	M
106 Pyrene	202	14.645	14.650	-0.005	99	531214	1.89	
108 Butyl benzyl phthalate	149	15.230	15.244	-0.014	92	255892	1.71	
109 3,3'-Dichlorobenzidine	252	15.729	15.734	-0.005	82	155549	1.67	
110 Bis(2-ethylhexyl) phthalate	149	15.720	15.734	-0.014	94	386529	1.88	
111 Benzo[a]anthracene	228	15.739	15.748	-0.009	92	400882	1.95	
112 Chrysene	228	15.772	15.786	-0.014	73	539437	2.06	
113 Di-n-octyl phthalate	149	16.252	16.271	-0.019	97	596134	1.81	
114 Benzo[b]fluoranthene	252	16.671	16.676	-0.005	92	358530	1.63	

460359(5) / 1017248(2) = 1.3138

290495(5) / 632460(2) = 1.148

TC 3/21/13

1.019 = 386529 (5) / 1030518 (X) = 1.84 ng/mL or 0.937 RF

Analyte

Lab ID	Anal Date	Batch	Samp	Analyst	Method	Prep Method	Equipment	Result	Units	Detecte
MDLV 480-50424/3-A	02/21/2012	52322	26	McKernan, Ryan	8270C		HP5973X	163.35321	ug/Kg	Pass

MDL Check ✓

Bis(2-chloroethyl)ether

Current MDL	Current RL	Ver MDL	Spike amoun	Units	Spike /MDL	% Rec Mean	Std Dev	Reps	Edit Limts?	
14.57441	170	14.5744	165.67263	ug/Kg	11.4	101.8	NA	1	N	

MDLV used - 52322-26 All values recover
MDLV: Spike High

Lab ID	Anal Date	Batch	Samp	Analyst	Method	Prep Method	Equipment	Result	Units	Detecte
MDLV 480-50424/3-A	02/21/2012	52322	26	McKernan, Ryan	8270C		HP5973X	168.65473	ug/Kg	Pass

Bis(2-ethylhexyl) phthalate

Current MDL	Current RL	Ver MDL	Spike amoun	Units	Spike /MDL	% Rec Mean	Std Dev	Reps	Edit Limts?	
54.38616	170	54.3861	165.67263	ug/Kg	3	120.8	NA	1	N	

MDL+4=216

MDLV used - 52322-26 All values recover
MDLV: Spike High ok

Lab ID	Anal Date	Batch	Samp	Analyst	Method	Prep Method	Equipment	Result	Units	Detecte
MDLV 480-50424/3-A	02/21/2012	52322	26	McKernan, Ryan	8270C		HP5973X	200.13253	ug/Kg	Pass

Butyl benzyl phthalate

Current MDL	Current RL	Ver MDL	Spike amoun	Units	Spike /MDL	% Rec Mean	Std Dev	Reps	Edit Limts?	
45.32835	170	45.3283	165.67263	ug/Kg	3.7	106.8	NA	1	N	

=180

MDLV used - 52322-26 All values recover
MDLV: Spike High ok

Lab ID	Anal Date	Batch	Samp	Analyst	Method	Prep Method	Equipment	Result	Units	Detecte
MDLV 480-50424/3-A	02/21/2012	52322	26	McKernan, Ryan	8270C		HP5973X	176.93836	ug/Kg	Pass

Caprolactam

Current MDL	Current RL	Ver MDL	Spike amoun	Units	Spike /MDL	% Rec Mean	Std Dev	Reps	Edit Limts?	
73.02415	170	73.0241	165.67263	ug/Kg	2.3	107.0	NA	1	N	

MDLV used - 52322-26 All values recover
MDLV: Pass

Lab ID	Anal Date	Batch	Samp	Analyst	Method	Prep Method	Equipment	Result	Units	Detecte
MDLV 480-50424/3-A	02/21/2012	52322	26	McKernan, Ryan	8270C		HP5973X	177.26971	ug/Kg	Pass

Carbazole

Current MDL	Current RL	Ver MDL	Spike amoun	Units	Spike /MDL	% Rec Mean	Std Dev	Reps	Edit Limts?	
1.95306	170	1.95306	165.67263	ug/Kg	84.8	108.6	NA	1	N	

MDLV used - 52322-26 All values recover
MDLV: Spike High

Lab ID	Anal Date	Batch	Samp	Analyst	Method	Prep Method	Equipment	Result	Units	Detecte
MDLV 480-50424/3-A	02/21/2012	52322	26	McKernan, Ryan	8270C		HP5973X	179.92047	ug/Kg	Pass

Chrysene

Current MDL	Current RL	Ver MDL	Spike amoun	Units	Spike /MDL	% Rec Mean	Std Dev	Reps	Edit Limts?	
1.68779	170	1.68779	165.67263	ug/Kg	98.2	116.8	NA	1	N	

MDLV used - 52322-26 All values recover
MDLV: Spike High

Lab ID	Anal Date	Batch	Samp	Analyst	Method	Prep Method	Equipment	Result	Units	Detecte
MDLV 480-50424/3-A	02/21/2012	52322	26	McKernan, Ryan	8270C		HP5973X	193.50563	ug/Kg	Pass

Dibenz(a,h)anthracene

Current MDL	Current RL	Ver MDL	Spike amoun	Units	Spike /MDL	% Rec Mean	Std Dev	Reps	Edit Limts?	
1.98543	170	1.98543	165.67263	ug/Kg	83.4	100.2	NA	1	N	

MDLV used - 52322-26 All values recover
MDLV: Spike High

Lab ID	Anal Date	Batch	Samp	Analyst	Method	Prep Method	Equipment	Result	Units	Detecte
MDLV 480-50424/3-A	02/21/2012	52322	26	McKernan, Ryan	8270C		HP5973X	166.00397	ug/Kg	Pass

Dibenzofuran

Current MDL	Current RL	Ver MDL	Spike amoun	Units	Spike /MDL	% Rec Mean	Std Dev	Reps	Edit Limts?	
1.75662	170	1.75662	165.67263	ug/Kg	94.3	105.2	NA	1	N	

MDLV used - 52322-26 All values recover
MDLV: Spike High

Lab ID	Anal Date	Batch	Samp	Analyst	Method	Prep Method	Equipment	Result	Units	Detecte
MDLV 480-50424/3-A	02/21/2012	52322	26	McKernan, Ryan	8270C		HP5973X	174.28760	ug/Kg	Pass

TC
2/6/13

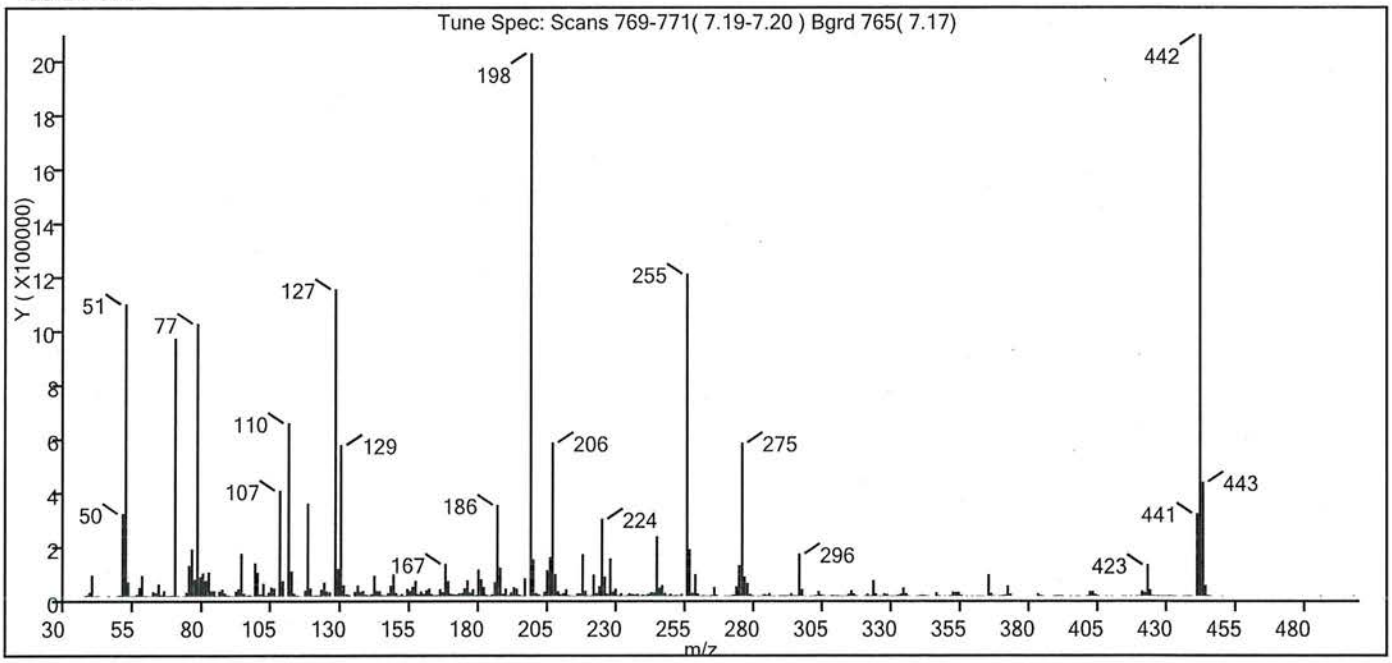
Report Date: 18-Dec-2012 16:42:54 Chrom Revision: 2.0 22-Oct-2012 16:30:48

MS Tune Report

TestAmerica Buffalo

Data File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3130.D		
Injection Date:	18-Dec-2012 11:04:30	Limit Group:	MB - 8270RCP_MCP ICAL
Client ID:		Instrument ID:	HP5973X
Lims Batch ID:	96347	Lims Sample ID:	1
Operator ID:	ANM	Injection Vol:	1.0 ul
Column Type:	RXI-5Sil MS	Column Dia:	0.25 mm
Tune Method:	DFTPP Method 8270		

35 DFTPP



m/z	Ion Abundance Criteria	% Relative Abundance
198	Base Peak, 100% relative abundance	100.00
51	30.00 - 60.00% of mass 198	53.84
68	Less than 2.00% of mass 69	0.14 (0.29)
69	Present	47.50
70	Less than 2.00% of mass 69	0.08 (0.17)
127	40.00 - 60.00% of mass 198	56.56
197	Less than 1.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.82
275	10.00 - 30.00% of mass 198	28.29
365	Greater than 1.00% of mass 198	3.95
441	Present, but less than mass 443%	15.24 (72.50)
442	Greater than 40.00% of mass 198	103.44
443	17.00 - 23.00% of mass 442	21.02 (20.33)

Tier 3 checks

$\frac{127}{198} = \frac{1127424}{1993216} =$

0.5656

5/21/13

TC

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-29598-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 480-95170/2-A
Matrix: Solid
Lab File ID: X3144.D
Analysis Method: 8270D
Date Collected:
Extract. Method: 3546
Date Extracted: 12/11/2012 08:50
Sample wt/vol: 000030.4(g)
Date Analyzed: 12/18/2012 17:44
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.: 96347
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	60.2		33	9.9
95-50-1	1,2-Dichlorobenzene	55.0		33	9.9
541-73-1	1,3-Dichlorobenzene	51.1		33	9.9
100-52-7	Benzaldehyde	212		33	9.9
106-46-7	1,4-Dichlorobenzene	58.8		33	9.9
108-60-1	2,2'-oxybis[1-chloropropane]	52.7		33	9.9
95-95-4	2,4,5-Trichlorophenol	49.6		33	11
88-06-2	2,4,6-Trichlorophenol	43.2		33	14
100-51-6	Benzyl alcohol	ND		66	9.9
120-83-2	2,4-Dichlorophenol	56.8		33	9.9
105-67-9	2,4-Dimethylphenol	74.3		33	9.9
51-28-5	2,4-Dinitrophenol	49.6		33	27
121-14-2	2,4-Dinitrotoluene	52.9		33	9.9
100-01-6	4-Nitroaniline	51.6	J	160	28
606-20-2	2,6-Dinitrotoluene	28.4	J	33	28
91-58-7	2-Chloronaphthalene	113		33	9.9
95-57-8	2-Chlorophenol	53.2		33	9.9
86-30-6	N-Nitrosodiphenylamine	98.8		33	9.9
91-57-6	2-Methylnaphthalene	55.1		33	9.9
95-48-7	2-Methylphenol	39.2		33	9.9
88-75-5	2-Nitrophenol	46.9		33	13
91-94-1	3,3'-Dichlorobenzidine	50.2	J	66	12
88-74-4	2-Nitroaniline	47.3	J	160	41
101-55-3	4-Bromophenyl phenyl ether	58.2		33	9.9
77-47-4	Hexachlorocyclopentadiene	45.8	J	66	9.9
106-47-8	4-Chloroaniline	36.3	J	66	30
100-02-7	4-Nitrophenol	ND		160	14
83-32-9	Acenaphthene	53.7		33	9.9
534-52-1	4,6-Dinitro-2-methylphenol	74.2	J	160	32
95-94-3	1,2,4,5-Tetrachlorobenzene	112		33	9.9
208-96-8	Acenaphthylene	60.1		33	9.9
98-86-2	Acetophenone	380		33	9.9
62-53-3	Aniline	98.6		33	9.9
120-12-7	Anthracene	61.4		33	9.9

3/21/13
TC

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-29598-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 480-95170/2-A
Matrix: Solid
Lab File ID: X3144.D
Analysis Method: 8270D
Date Collected:
Extract. Method: 3546
Date Extracted: 12/11/2012 08:50
Sample wt/vol: 000030.4(g)
Date Analyzed: 12/18/2012 17:44
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.: 96347
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
91-20-3	Naphthalene	56.9		33	9.9
98-95-3	Nitrobenzene	61.4		33	9.9
87-86-5	Pentachlorophenol	59.8		33	9.9
85-01-8	Phenanthrene	60.8		33	9.9
119-61-9	Benzophenone	216		33	9.9
108-95-2	Phenol	59.9		33	9.9
129-00-0	Pyrene	64.4		33	9.9
62-75-9	N-Nitrosodimethylamine	155		33	9.9
90-12-0	1-Methylnaphthalene	214		33	9.9
106-44-5	4-Methylphenol	123		33	9.9

CAS NO.	SURROGATE	%REC	Q	LIMITS
118-79-6	2,4,6-Tribromophenol	76		30-130
367-12-4	2-Fluorophenol	77		30-130
4165-60-0	Nitrobenzene-d5	83		30-130
4165-62-2	Phenol-d5	80		30-130
321-60-8	2-Fluorobiphenyl	89		30-130
1718-51-0	p-Terphenyl-d14	100		30-130

5/21/13
TC

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3144.D		
Lims ID:	LCS 480-95170/2-A	Client ID:	
Inject. Date:	18-Dec-2012 17:44:30	Dil. Factor:	1.0000
Sample Type:	LCS		
Sample ID:	480-0017654-015		
Misc. Info.:			
Operator:	ANM	Instrument ID:	HP5973X
Injection Vol:	1.0 ul	ALS Bottle#:	16
Lims Batch ID:	96347	Lims Sample ID:	15
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973X\20121218-17654.b\X-8270LL.m		
Last Update:	11-Mar-2013 09:26:19	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:	XAWRK026		

First Level Reviewer: mckernar Date: 19-Dec-2012 08:53:35

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
* 1 1,4-Dichlorobenzene-d4	152	6.565	6.537	0.028	83	231141	5.00	
* 2 Naphthalene-d8	136	8.463	8.425	0.038	98	845678	5.00	
* 3 Acenaphthene-d10	164	11.102	11.035	0.067	92	513723	5.00	
* 4 Phenanthrene-d10	188	13.118	13.052	0.066	97	825641	5.00	
* 5 Chrysene-d12	240	15.753	15.720	0.033	97	640868	5.00	
* 6 Perylene-d12	264	17.023	17.004	0.019	97	629407	5.00	
$ 7 2-Fluorophenol	112	4.701	4.672	0.029	0	80443	1.53	M
$ 8 Phenol-d5	99	6.099	6.061	0.038	0	102068	1.60	M
$ 9 Nitrobenzene-d5	82	7.402	7.374	0.028	75	105853	1.67	
$ 10 2-Fluorobiphenyl	172	10.113	10.056	0.057	93	230034	1.78	
$ 11 2,4,6-Tribromophenol	330	12.277	12.196	0.081	0	23062	1.52	M
$ 12 p-Terphenyl-d14	244	14.792	14.740	0.052	92	246699	2.00	
18 1,4-Dioxane	88	2.471	2.580	-0.109	35	169879	7.17	
19 N-Nitrosodimethylamine	42	2.803	2.918	-0.115	68	198814	4.71	
20 Pyridine	52	2.880	2.975	-0.095	82	90617	2.11	
21 Benzaldehyde	77	5.928	5.909	0.019	91	292091	6.45	
23 Aniline	93	6.099	6.071	0.028	94	253579	3.00	
22 Phenol	94	6.142	6.080	0.062	0	128222	1.82	M
24 Bis(2-chloroethyl)ether	93	6.199	6.170	0.029	90	100794	1.82	
25 2-Chlorophenol	128	6.275	6.237	0.038	93	96867	1.62	
26 1,3-Dichlorobenzene	146	6.475	6.451	0.024	96	115435	1.55	
27 1,4-Dichlorobenzene	146	6.589	6.565	0.024	58	132603	1.79	
28 Benzyl alcohol	108		6.774					19
29 1,2-Dichlorobenzene	146	6.812	6.784	0.028	83	115601	1.67	
31 2-Methylphenol	108	7.012	6.965	0.047	0	59841	1.19	M
32 2,2'-oxybis[1-chloropropane]	45	7.003	6.979	0.024	71	144423	1.60	
33 Acetophenone	105	7.179	7.155	0.024	97	990928	11.6	
34 N-Nitrosodi-n-propylamine	70	7.188	7.164	0.024	60	80588	1.87	
36 4-Methylphenol	108	7.255	7.212	0.043	0	189952	3.73	M
37 Hexachloroethane	117	7.298	7.274	0.024	89	43178	1.42	

Tier 3 check

0.98 = 292091(S) / 231141(X)

6.447 ✓

212 mg/kg / 329

64%

3/21/13 TC

Report Date: 11-Mar-2013 09:26:20 Chrom Revision: 2.0 01-Feb-2013 10:03:10
Data File: \\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3144.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
38 Nitrobenzene	77	7.431	7.402	0.029	79	122926	1.87	
40 Isophorone	82	7.792	7.764	0.028	73	187662	1.73	
41 2-Nitrophenol	139	7.916	7.873	0.043	86	42689	1.43	
43 2,4-Dimethylphenol	107	8.049	7.987	0.062	0	127602	2.26	M
42 o,o',o"-Triethylphosphorothioat	198	8.101	8.055	0.046	83	93472	0	
45 Bis(2-chloroethoxy)methane	93	8.154	8.111	0.042	93	110231	1.72	
44 Benzoic acid	105	8.154	8.168	-0.015	74	429	0.0195	
47 2,4-Dichlorophenol	162	8.334	8.268	0.066	0	79315	1.73	M
48 1,2,4-Trichlorobenzene	180	8.382	8.348	0.034	89	103453	1.83	
49 Naphthalene	128	8.496	8.458	0.038	79	324172	1.73 1.107 = 324172(5) / 845678 (x)	
51 4-Chloroaniline	127	8.643	8.586	0.057	1	74738	1.10	M
52 Hexachlorobutadiene	225	8.686	8.653	0.033	71	52199	1.69	
54 Caprolactam	113	9.171	9.114	0.057	46	147739	8.83	M
55 4-Chloro-3-methylphenol	107	9.628	9.371	0.257	1	94511	1.86	M
56 2-Methylnaphthalene	142	9.547	9.495	0.052	74	220054	1.68	
57 1-Methylnaphthalene	142	9.685	9.637	0.048	87	788176	6.52	
58 Hexachlorocyclopentadiene	237	9.775	9.728	0.047	49	23262	1.39	
59 1,2,4,5-Tetrachlorobenzene	216	9.799	9.747	0.052	87	164629	3.42	
60 2,4,6-Trichlorophenol	196	10.037	9.951	0.086	78	38971	1.31	M
61 2,4,5-Trichlorophenol	196	10.179	10.037	0.142	77	43304	1.51	M
62 1,1'-Biphenyl	154	10.255	10.198	0.057	96	1256640	8.46	
63 2-Chloronaphthalene	162	10.303	10.241	0.062	88	431755	3.44	
64 Phenyl ether	170	10.422	10.360	0.062	95	519902	6.44	
65 2-Nitroaniline	65	10.503	10.417	0.086	67	48943	1.44	
66 1,4-Dinitrobenzene	75	10.712	10.641	0.071	85	127365	0	
67 Dimethyl phthalate	163	10.764	10.693	0.071	90	234099	1.76	
68 2,6-Dinitrotoluene	165	10.850	10.783	0.067	73	52008	0.8630	
69 Acenaphthylene	152	10.893	10.821	0.072	84	328345	1.83	
70 3-Nitroaniline	138	11.159	11.045	0.114	1	44334	1.48	M
71 Acenaphthene	153	11.150	11.083	0.067	88	204429	1.63	
72 2,4-Dinitrophenol	184	11.354	11.211	0.143	1	13587	1.51	M
73 Dibenzofuran	168	11.421	11.349	0.072	99	286739	1.88	
74 2,4-Dinitrotoluene	165	11.487	11.387	0.100	91	61848	1.61	M
75 4-Nitrophenol	109		11.421					
76 2,3,4,6-Tetrachlorophenol	232	11.663	11.563	0.100	71	45626	1.98	
78 Diethyl phthalate	149	11.811	11.744	0.067	90	247996	1.70	
77 Thionazin	97	11.920	11.826	0.094	54	97240	0	
79 Fluorene	166	11.920	11.853	0.067	88	227820	1.63	
80 4-Chlorophenyl phenyl ether	204	11.939	11.868	0.071	86	112003	1.81	
81 4-Nitroaniline	138	12.105	11.953	0.152	41	40309	1.57	M
82 4,6-Dinitro-2-methylphenol	198	12.086	11.982	0.104	31	29909	2.26	M
84 Diphenylamine	169	12.115	12.048	0.067	97	576586	3.00	
83 N-Nitrosodiphenylamine	169	12.115	12.048	0.067	97	576586	3.00	
16 1,2-Diphenylhydrazine	77	12.153	12.086	0.067	96	712958	5.75	
85 Azobenzene	77	12.153	12.086	0.067	95	712958	5.76	
86 Benzophenone	105	12.177	12.110	0.067	89	802515	6.57	M
87 Sulfotepp	322	12.348	12.297	0.051	77	75633	0	
88 Phorate	75	12.500	12.454	0.046	84	254150	0	
89 4-Bromophenyl phenyl ether	248	12.586	12.519	0.067	78	54712	1.77	
91 Hexachlorobenzene	284	12.643	12.581	0.062	60	54762	1.73	
90 Dimethoate	87	12.738	12.668	0.070	82	136002	0	
93 Atrazine	200	12.823	12.771	0.052	88	270880	7.01	

1.73 ng/uL

56.90 / 65.8 = 86%

3/21/13 TC

Report Date: 11-Mar-2013 09:26:20 Chrom Revision: 2.0 01-Feb-2013 10:03:10
Data File: \\Bufchrom\ChromData\HP5973X\20121218-17654.b\X3144.D

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ng/uL	Flags
95 Pentachloronitrobenzene	237	12.909	12.852	0.057	49	60324	3.68	
94 Pentachlorophenol	266	12.919	12.852	0.067	0	15639	1.82	M
97 Phenanthrene	178	13.142	13.080	0.062	83	340159	1.85	
96 Disulfoton	88	13.142	13.120	0.022	78	205453	0	
98 Anthracene	178	13.209	13.142	0.067	95	349728	1.87	
100 Methyl parathion	109	13.570	13.543	0.027	81	128359	0	
102 Di-n-butyl phthalate	149	13.794	13.741	0.053	96	388281	1.93	
103 Ethyl Parathion	97	13.979	14.003	-0.024	74	90880	0	
104 Fluoranthene	202	14.421	14.364	0.057	93	322753	1.77	
105 Benzidine	184	14.616	14.540	0.076	80	125125	1.77	M
106 Pyrene	202	14.645	14.588	0.057	99	336259	1.96	
107 Famphur	218	15.192	15.154	0.038	78	187387	0	
108 Butyl benzyl phthalate	149	15.235	15.196	0.039	86	169259	1.78	
109 3,3'-Dichlorobenzidine	252	15.729	15.691	0.038	75	87952	1.53	M
110 Bis(2-ethylhexyl) phthalate	149	15.720	15.696	0.024	95	230886	1.77	
111 Benzo[a]anthracene	228	15.743	15.705	0.038	76	267251	1.94	
112 Chrysene	228	15.777	15.743	0.034	86	291886	1.86	
113 Di-n-octyl phthalate	149	16.247	16.238	0.009	96	357927	1.74	
114 Benzo[b]fluoranthene	252	16.671	16.647	0.024	86	231570	1.58	
115 Benzo[k]fluoranthene	252	16.695	16.666	0.028	82	339227	2.25	
116 Benzo[a]pyrene	252	16.980	16.951	0.029	61	223784	1.58	
117 Indeno[1,2,3-cd]pyrene	276	18.126	18.093	0.033	91	309569	2.05	M
118 Dibenz(a,h)anthracene	278	18.131	18.093	0.038	48	263255	2.06	M
119 Benzo[g,h,i]perylene	276	18.440	18.411	0.029	89	242300	1.92	M
S 121 3-Methylphenol	1		0.000					

QC Flag Legend

Processing Flags
1 - Missing Peaks
9 - Failed A Reference Spectral Test

Review Flags
M - Manually Integrated

$1.10 = \frac{322753(5)}{\cancel{629407}\ 825641\ (X)} = \cancel{2.33}\ 1.78$

3/21/13
TC

INORGANICS

TAL METALS (including mercury)

Tin only

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 #: 480-29598-1

LAB # : Test America - Buffalo

Sample IDs: Attached tracking sheet or sample listing. OC-SB-528-0.0/1.0-XXY
OC-SB-528-10/3.0-XXY
OC-DUP-2

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 Arsenic and Thallium, 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.	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.	
☑	☐	☐	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	

N/A

Tin @ 59% : 58% in the QL Standard
J Qual all results

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	
☐	☑		☐ 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	
			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	OC-SB-528-1.0/3.0-xxxMS
☑	☐		☐ 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)	
☐	☐	☑	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				
☑	☐	☐	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: 2/7/13

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-SB-528-0.0/1.0-XXX

Lab Sample ID: 480-29598-7

Lab Name: TestAmerica Buffalo

Job No.: 480-29598-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/05/2012 14:00

Reporting Basis: DRY

Date Received: 12/05/2012 18:15

% Solids: 27.0

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-31-5	Tin	7.5	8.0	1.7	mg/Kg	J		1	6010

2/7/13
TC

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: OC-SB-528-1.0/3.0-XXX

Lab Sample ID: 480-29598-8

Lab Name: TestAmerica Buffalo

Job No.: 480-29598-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/05/2012 14:05

Reporting Basis: DRY

Date Received: 12/05/2012 18:15

% Solids: 41.0

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-31-5	Tin	2.4	5.2	1.1	mg/Kg	J		1	6010

2/7/13
TC

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: OC-DUP-2

Lab Sample ID: 480-29598-11

Lab Name: TestAmerica Buffalo

Job No.: 480-29598-1

SDG ID.:

Matrix: Solid

Date Sampled: 12/05/2012 00:00

Reporting Basis: DRY

Date Received: 12/05/2012 18:15

% Solids: 46.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-31-5	Tin	2.1	4.3	0.93	mg/Kg	J		1	6010

2/7/13
TC

Sample Name: 480-29598-D-7-D Acquired: 12/21/2012 19:41:35 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	**.00275**	**38.976**	F **-.39919**	**.00598**	**.19969**	**.00336**	**7.1261**	**.00175**	**.00150**
Stddev	.00034	.227	.00490	.00005	.00025	.00003	.0411	.00005	.00011
%RSD	12.263	.58134	1.2269	.86884	.12362	.97767	.57740	2.8492	7.3102
#1	.00251	38.815	-.39573	.00594	.19952	.00338	7.0970	.00172	.00158
#2	.00299	39.136	-.40266	.00602	.19987	.00333	7.1552	.00179	.00143
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit			40.000						
Low Limit			-.01000						

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	F **92.138**	**.26496**	**41.371**	**.79105**	**.73807**	**.01668**	**1.9292**	**.19101**	**.01975**
Stddev	.067	.00088	.484	.02040	.00794	.00075	.0132	.00040	.00000
%RSD	.07242	.33382	1.1711	2.5784	1.0754	4.4954	.68627	.20878	.00853
#1	92.185	.26433	41.029	.77663	.73246	.01721	1.9198	.19073	.01975
#2	92.091	.26558	41.714	.80547	.74368	.01615	1.9385	.19130	.01975
Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	40.000								
Low Limit	-.00400								

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	**.94636**	**.04285**	**.38360**	F **15.99**	F **-.32128**	**.00896**	**11.289**	**.01875**	**.04107**
Stddev	.01771	.00066	.00236	.03	.00218	.00354	.091	.00022	.00014
%RSD	1.8714	1.5435	.61464	.1763	.67946	39.552	.80309	1.1771	.33843
#1	.93384	.04332	.38527	16.01	-.31973	.00645	11.224	.01860	.04097
#2	.95888	.04238	.38193	15.97	-.32282	.01146	11.353	.01891	.04116
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				10.00	50.000				
Low Limit				-.0100	-.02000				

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	**.76798**	**.02669**	**.40140**	**.03923**
Stddev	.00330	.00269	.00081	.00044
%RSD	.42932	10.086	.20134	1.1160
#1	.76565	.02860	.40197	.03892
#2	.77032	.02479	.40083	.03954
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	**3889.1**	**7110.7**	**66886.**	**9362.0**
Stddev	17.5	27.0	73.	71.4
%RSD	.44875	.37906	.10881	.76255
#1	3876.8	7091.7	66938.	9412.5
#2	3901.5	7129.8	66835.	9311.5

$$\frac{0.01875\,mg}{L} \times \frac{0.050\,L}{0.004634\,kg}$$

$$\frac{2.02\,mg/kg}{.27\,\%Solid} = 7.5\,mg/kg$$

2/7/13
TC

Sample Name: 480-29598-B-8-E Acquired: 12/21/2012 19:43:53 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	**.00098**	**24.048**	F **-.05297**	**.00320**	**.15193**	**.00194**	**7.9387**	**.00133**	**.01200**
Stddev	.00076	.173	.00283	.00021	.00011	.00007	.0357	.00021	.00010
%RSD	78.372	.71773	5.3431	6.5336	.07202	3.3643	.45032	15.511	.84931
#1	.00152	23.926	-.05097	.00334	.15201	.00198	7.9134	.00148	.01193
#2	.00043	24.170	-.05498	.00305	.15185	.00189	7.9639	.00118	.01207
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit			40.000						
Low Limit			-.01000						

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	**26.962**	**.09352**	**16.226**	**.90799**	**.83165**	**.02711**	**2.6449**	**.23377**	**.00769**
Stddev	.049	.00018	.076	.02475	.00096	.00137	.0008	.00002	.00008
%RSD	.18135	.19646	.47086	2.7262	.11590	5.0668	.03054	.01014	1.0280
#1	26.928	.09339	16.172	.89049	.83097	.02808	2.6455	.23379	.00763
#2	26.997	.09365	16.280	.92549	.83233	.02613	2.6443	.23376	.00774
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	**.85909**	**.02814**	**.14748**	F **11.66**	F **-.12940**	**.00760**	**11.926**	**.00902**	**.04165**
Stddev	.01461	.00014	.00292	.05	.00193	.00079	.023	.00012	.00001
%RSD	1.7009	.51517	1.9779	.4140	1.4934	10.345	.19479	1.3806	.01930
#1	.86943	.02825	.14954	11.62	-.13077	.00816	11.910	.00911	.04164
#2	.84876	.02804	.14541	11.69	-.12804	.00704	11.943	.00893	.04165
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				10.00	50.000				
Low Limit				-.0100	-.02000				

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	**.67235**	**.00599**	**.11356**	**.07587**
Stddev	.00461	.00292	.00026	.00002
%RSD	.68595	48.769	.22774	.02302
#1	.67561	.00392	.11337	.07585
#2	.66909	.00805	.11374	.07588
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

OC-SB-528-1.0/3.0-xxx

$\frac{.00902\,mg}{L} \times \frac{.05\,L}{.0004662} =$

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	**3947.6**	**7084.2**	**64816.**	**9213.5**
Stddev	11.2	10.9	50.	18.7
%RSD	.28466	.15409	.07785	.20331
#1	3955.5	7091.9	64851.	9226.7
#2	3939.6	7076.5	64780.	9200.2

$\frac{.0967}{.41} = 2.359$

TC
2/7/13

Sample Name: 480-29598-B-8-F MS Acquired: 12/21/2012 19:55:21 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	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09131**	**45.815**	**.33626**	**.36048**	**.52683**	**.36285**	**25.819**	**.35861**	**.38921**
Stddev	.00081	.579	.00401	.00000	.00506	.00597	.247	.00055	.00077
%RSD	.88242	1.2630	1.1919	.00118	.96103	1.6445	.95794	.15316	.19690
#1	.09074	45.406	.33343	.36048	.52325	.35863	25.644	.35823	.38975
#2	.09188	46.224	.33910	.36047	.53041	.36707	25.994	.35900	.38866
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	**21.771**	**.46088**	**34.165**	**19.269**	**19.280**	**.39954**	**20.549**	**.60949**	**.36697**
Stddev	.024	.00062	.589	.270	.458	.00527	.001	.00150	.00086
%RSD	.10831	.13449	1.7235	1.4016	2.3752	1.3178	.00387	.24587	.23559
#1	21.787	.46132	33.749	19.078	18.956	.39582	20.548	.61055	.36636
#2	21.754	.46044	34.582	19.460	19.604	.40326	20.549	.60843	.36758
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	**18.870**	**.39546**	**.50804**	**F 11.49**	**.23049**	**.36284**	**26.555**	**.35952**	**.39594**
Stddev	.302	.00014	.00144	.02	.00021	.00139	.280	.00105	.00387
%RSD	1.6005	.03621	.28267	.1778	.09258	.38421	1.0562	.29175	.97672
#1	18.656	.39536	.50906	11.50	.23034	.36382	26.357	.36026	.39320
#2	19.084	.39556	.50703	11.47	.23064	.36185	26.754	.35878	.39867
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	**1.2455**	**.36648**	**.47722**	**.51385**
Stddev	.0031	.00165	.00093	.00003
%RSD	.24566	.45022	.19576	.00579
#1	1.2477	.36531	.47788	.51387
#2	1.2434	.36764	.47656	.51383
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	**3690.9**	**6914.4**	**61852.**	**9120.3**
Stddev	11.0	4.4	188.	114.6
%RSD	.29820	.06292	.30375	1.2561
#1	3683.1	6911.3	61719.	9201.4
#2	3698.7	6917.5	61985.	9039.3

MS check

$0.3595 \times \frac{.05}{.4741} = \frac{0.0379}{.359}$

TC ~~0.0924~~ 0.10557

TC ~~92.4 mg/kg~~

106 − 2.4

$\frac{104}{118} = 88\%$ TC 2/7/13

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-29598-1

SDG No.:

Method: 6010 Instrument ID: ICAP1

Lab Sample ID: CRI 480-97273/7 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00045

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Tin	0.0100	0.00592	J ^	59	70-130

Lab Sample ID: CRI 480-97273/42 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00045

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Tin	0.0100	0.00575	J ^	58	70-130

Raw instrument Concentration (mg/L)

OC-SB-528-0.0/10xxx 0.01875 J Qual

OC-SB-528-1.0/3.0-xxx 0.00902

OC-DUP-2 0.00957

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

FORM IIB-IN

TC
2/7/13

DATA VALIDATION MDL STUDY REVIEW
OLIN OU1 Soil November/December 2012

Analyte	Units	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	MDL9	Average	Standard Deviation	*MDL (T*SD)	MDL reported by the lab
Tin	mg/L	0.02156	0.0217	0.02048	0.01936	0.02628	0.02332				0.02212	0.002431	0.008	0.019

* = **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
Is Spike Conc. > 10x MDL?	N	Y = failure

MDL mg/Kg = 0.8

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 #: 6107130016-10 SDG #: 480-29598-1

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	
☐	☐	☑	Were the method-required number of analyses or scans of the tuning solution performed?	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.
☐	☐	☑	Check raw data. Is the tune data accurately reported on the tabulated forms?	
☐	☐	☑	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.	
			Calibration	
☑	☐	☐	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?	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 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?	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?	

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.	
TC ☑ ☑ ☐ 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	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 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. 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.	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 Reported	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?	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.)	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	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: _____

Date: 2/7/13

CHEMIST REVIEW-VALIDATION CHECKLIST

Project: Olin Chemical Superfund Site **Method: Tributyltin by Lab Specific Method GC/FPD**
Project #: 6107130016-10 **Laboratory and SDG: TAL-Buffalo SDG# 480-29598-1**
Date: **2/18/13** Reviewer: **Tige Cuningham**

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

QC Limits listed below are laboratory limits. Tributyltin was added to the Olin Chemical analyte list in December 2012 and is not presented in the Olin Chemical Superfund Site QAPP [MACTEC, 2009].

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

   Dual Column confirmation used in this method.

2. **Holding Time and Sample Preservation (40 days to extraction)**

   OK

3. **QC Blanks**

   Clean

4. **Laboratory Control Sample Review (Lab Limits: % recovery 30-160 , RPD 30)**

   OK, within limits

5. **Field Duplicate Precision (RPD 50)**

   OC-SB-528-1.0/3.0-XXX and OC-DUP-2 both ND

6. **Lab Duplicate Precision**

   N/A

7. **Matrix Spike Results (if applicable) (Lab Limits: % recovery 30-160 , RPD 30)**

   Sample spike performed on sample OC-SB-528-1.0/3.0-XXX. MS/MSD % recovery = 70/71%

8. **Surrogate Recovery (Tripentyltin) (Lab Limits: % recovery 30-120)**

   OK, within limits

9. **Internal Standard Recovery (if applicable)**

   RT of Internal Standard (Tetra-n-propyltin) in OC-SB-528-0.0/1.0-XXX was outside of lab established window on RTX-35 column. Standard was 6.76 min, sample was 6.86 min. RT was within lab limits on secondary column (RTX-5). No qualification.

CHEMIST REVIEW-VALIDATION CHECKLIST

FULL VALIDATION CHECKS

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

☑ **Initial Calibration (Lab RSD is $\leq$ 20 for RF Calibration <u>OR</u> Linear Regression r^2 of $\geq$ 0.990)**

OK, Within Lab Control limits

☑ **Continuing Calibration Verification (2nd Source and CCV within +/- 25%)**

OK, Within Lab Control limits

<u>Transcription and Calculation Checks</u>

☑ **Instrument Calibration**

OK, Within Lab Control limits

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

OK

☑ **Laboratory Control Sample**

OK

☑ **Matrix Spike**

OK

☑ **Field Sample Results**

OK

☑ **Surrogate Recovery**

OK

FORM I
GC SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington
Job No.: 480-29598-1
SDG No.:
Client Sample ID: OC-SB-528-0.0/1.0-XXX
Lab Sample ID: 480-29598-7
Matrix: Solid
Lab File ID: 11dec121807-r111.d
Analysis Method: Organotins/GC
Date Collected: 12/05/2012 14:00
Extraction Method: 3550C
Date Extracted: 12/10/2012 18:10
Sample wt/vol: 30.42(g)
Date Analyzed: 12/11/2012 23:05
Con. Extract Vol.: 1000(uL)
Dilution Factor: 1
Injection Volume: 1.5(uL)
GC Column: RTX-35
ID: 0.32(mm)
% Moisture: 73.0
GPC Cleanup:(Y/N) N
Analysis Batch No.: 49448
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
688-73-3	Tributyltin	~~ND~~	R	5.5	2.4

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00386	Tripentyltin	92		30-120

TC
2/18/13

FORM VI
GC SEMI VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Burlington Job No.: 480-29598-1 Analy Batch No.: 49433

SDG No.:

Instrument ID: 2860.i GC Column: RTX-35 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/11/2012 18:18 Calibration End Date: 12/11/2012 19:26 Calibration ID: 19596

Calibration Files:

LEVEL:	LAB SAMPLE ID:	EPA SAMPLE NO:	LAB FILE ID:
Level 1	IC 200-49433/1	50 PPB	11dec121742-r031.d
Level 2	IC 200-49433/2	100 PPB	11dec121742-r041.d
Level 3	ICRT 200-49433/3	250 PPB	11dec121742-r051.d
Level 4	IC 200-49433/4	500 PPB	11dec121742-r061.d
Level 5	IC 200-49433/5	1000 PPB	11dec121742-r071.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Tetrabutyltin	0.9203	0.7836	0.7574	0.7134	0.6968	Ave		0.7743				11.4		20.0			
Tributyltin	1.0554	0.9477	1.0230	0.9463	0.9149	Ave		0.9775				6.0		20.0			
Dibutyltin	1.1372	1.0298	1.1225	1.0666	1.0171	Ave		1.0747				5.0		20.0			
Monobutyltin	1.1561	1.0529	1.0983	1.0509	0.9946	Ave		1.0705				5.6		20.0			
Tripentyltin	0.8173	0.7315	0.7707	0.7192	0.6962	Ave		0.7470				6.4		20.0			

Initial Calibration check

TC 2/18/13

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

TestAmerica Burlington

Alkyl Tin Quantitation Report

Data file : /var/chem/2860_1.i/121112_1/11DEC121742.b/11dec121742-r031.d
Lab Smp Id: IC-406255 Client Smp ID: 50 PPB
Inj Date : 11-DEC-2012 18:18
Operator : RRM Inst ID: 2860_1.i
Smp Info : IC-406255,1,50 PPB
Misc Info :
Comment :
Method : /var/chem/2860_1.i/121112_1/11DEC121742.b/OR560_RTX35.m
Meth Date : 12-Dec-2012 09:25 rrm Quant Type: ISTD
Cal Date : 11-DEC-2012 18:18 Cal File: 11dec121742-r031.d
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: OR560_STD.sub
Target Version: 3.50 Sample Matrix: WATER
Processing Host: chemsvr5

Concentration Formula: Amt * DF * Vi/Vi * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Vi	1.50000	Volume injected (uL)

Cpnd Variable Local Compound Variable

RT	EXP RT	(REL RT)	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)	
* 1 Tetra-n-propyl tin					CAS #: 2176-98-9	
2.075	2.015	(0.000)	378894	500.000		(M)
2 Tetrabutyltin					CAS #: 1461-25-2	
4.493	4.475	(1.000)	34869	50.0000	59.43	
3 Tributyltin					CAS #: 688-73-3	
5.524	5.508	(1.000)	35591	44.5000	48.05	
4 Dibutyltin					CAS #: 1002-53-5	
6.417	6.402	(1.000)	33179	38.5000	40.74	
$ 5 Tripentyltin					CAS #: 3342-67-4	
6.776	6.761	(1.000)	27870	45.0000	49.24	

RF= 35591(500) / ~~35591(50)~~ 378894(44.5)

~~0.9393~~ 1.055 ✓

TC 2/18/13

TestAmerica Burlington

Alkyl Tin Quantitation Report

Data file : /var/chem/2860_1.i/121112_1/11DEC121742.b/11dec121742-r041.d
Lab Smp Id: IC-406256 Client Smp ID: 100 PPB
Inj Date : 11-DEC-2012 18:35
Operator : RRM Inst ID: 2860_1.i
Smp Info : IC-406256,1,100 PPB
Misc Info :
Comment :
Method : /var/chem/2860_1.i/121112_1/11DEC121742.b/OR560_RTX35.m
Meth Date : 12-Dec-2012 09:25 rrm Quant Type: ISTD
Cal Date : 11-DEC-2012 18:35 Cal File: 11dec121742-r041.d
Als bottle: 1 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: OR560_STD.sub
Target Version: 3.50 Sample Matrix: WATER
Processing Host: chemsvr5

Concentration Formula: Amt * DF * Vi/Vi * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Vi	1.50000	Volume injected (uL)

Cpnd Variable Local Compound Variable

RT	EXP RT (REL RT)	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
* 1 Tetra-n-propyl tin				CAS #: 2176-98-9
2.053	2.015 (1.000)	380871	500.000	
2 Tetrabutyltin				CAS #: 1461-25-2
4.478	4.475 (2.181)	59688	100.000	101.2
3 Tributyltin				CAS #: 688-73-3
5.506	5.508 (2.683)	64246	89.0000	86.29
4 Dibutyltin				CAS #: 1002-53-5
6.397	6.402 (3.117)	60404	77.0000	73.79
$ 5 Tripentyltin				CAS #: 3342-67-4
6.759	6.761 (3.293)	50150	90.0000	88.13

64246 (500)
380871 (89)

0.947

2/18/13
TC

TestAmerica Burlington

Alkyl Tin Quantitation Report

Data file : /var/chem/2860_1.i/121112_1/11DEC121742.b/11dec121742-r051.d
Lab Smp Id: ICRT-406257 Client Smp ID: 250 PPB
Inj Date : 11-DEC-2012 18:52
Operator : RRM Inst ID: 2860_1.i
Smp Info : ICRT-406257,1,250 PPB
Misc Info :
Comment :
Method : /var/chem/2860_1.i/121112_1/11DEC121742.b/OR560_RTX35.m
Meth Date : 12-Dec-2012 09:25 rrm Quant Type: ISTD
Cal Date : 11-DEC-2012 18:52 Cal File: 11dec121742-r051.d
Als bottle: 1 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: OR560_STD.sub
Target Version: 3.50 Sample Matrix: WATER
Processing Host: chemsvr5

Concentration Formula: Amt * DF * Vi/Vi * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Vi	1.50000	Volume injected (uL)

Cpnd Variable Local Compound Variable

RT	EXP RT	(REL RT)	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
* 1 Tetra-n-propyl tin					CAS #: 2176-98-9
2.015	2.015	(1.000)	369017	500.000	
2 Tetrabutyltin					CAS #: 1461-25-2
4.475	4.475	(2.221)	139754	250.000	244.6
3 Tributyltin					CAS #: 688-73-3
5.508	5.508	(2.734)	168365	223.000	233.4
4 Dibutyltin					CAS #: 1002-53-5
6.402	6.402	(3.177)	159885	193.000	201.6
$ 5 Tripentyltin					CAS #: 3342-67-4
6.761	6.761	(3.355)	127987	225.000	232.2

IC

RF $\frac{168365(500)}{369017(223)}$

1.02

TC
2/18/13

TestAmerica Burlington

Alkyl Tin Quantitation Report

Data file : /var/chem/2860_1.i/121112_1/11DEC121742.b/11dec121742-r061.d
Lab Smp Id: IC-406258 Client Smp ID: 500 PPB
Inj Date : 11-DEC-2012 19:09
Operator : RRM Inst ID: 2860_1.i
Smp Info : IC-406258,1,500 PPB
Misc Info :
Comment :
Method : /var/chem/2860_1.i/121112_1/11DEC121742.b/OR560_RTX35.m
Meth Date : 12-Dec-2012 09:25 rrm Quant Type: ISTD
Cal Date : 11-DEC-2012 19:09 Cal File: 11dec121742-r061.d
Als bottle: 1 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: OR560_STD.sub
Target Version: 3.50 Sample Matrix: WATER
Processing Host: chemsvr5

Concentration Formula: Amt * DF * Vi/Vi * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Vi	1.50000	Volume injected (uL)

Cpnd Variable Local Compound Variable

RT	EXP RT	(REL RT)	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
* 1 Tetra-n-propyl tin					CAS #: 2176-98-9
2.055	2.015	(1.000)	381209	500.000	
2 Tetrabutyltin					CAS #: 1461-25-2
4.480	4.475	(2.180)	271953	500.000	460.7
3 Tributyltin					CAS #: 688-73-3
5.508	5.508	(2.681)	321062	445.000	430.8
4 Dibutyltin					CAS #: 1002-53-5
6.400	6.402	(3.114)	313076	385.000	382.1
$ 5 Tripentyltin					CAS #: 3342-67-4
6.759	6.761	(3.289)	246741	450.000	433.2

RF= 321062 (500) / 381209 (445)

0.9463

2/18/13
TC

TestAmerica Burlington

Alkyl Tin Quantitation Report

Data file : /var/chem/2860_1.i/121112_1/11DEC121742.b/11dec121742-r071.d
Lab Smp Id: IC-406259 Client Smp ID: 1000 PPB
Inj Date : 11-DEC-2012 19:26
Operator : RRM Inst ID: 2860_1.i
Smp Info : IC-406259,1,1000 PPB
Misc Info :
Comment :
Method : /var/chem/2860_1.i/121112_1/11DEC121742.b/OR560_RTX35.m
Meth Date : 12-Dec-2012 09:25 rrm Quant Type: ISTD
Cal Date : 11-DEC-2012 19:26 Cal File: 11dec121742-r071.d
Als bottle: 1 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: OR560_STD.sub
Target Version: 3.50 Sample Matrix: WATER
Processing Host: chemsvr5

Concentration Formula: Amt * DF * Vi/Vi * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Vi	1.50000	Volume injected (uL)

Cpnd Variable Local Compound Variable

RT	EXP RT	(REL RT)	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
* 1 Tetra-n-propyl tin					CAS #: 2176-98-9
2.044	2.015	(1.000)	376682	500.000	
2 Tetrabutyltin					CAS #: 1461-25-2
4.471	4.475	(2.188)	524951	1000.00	899.9
3 Tributyltin					CAS #: 688-73-3
5.502	5.508	(2.692)	613451	890.000	833.1
4 Dibutyltin					CAS #: 1002-53-5
6.393	6.402	(3.128)	590032	770.000	728.8
$ 5 Tripentyltin					CAS #: 3342-67-4
6.754	6.761	(3.305)	472068	900.000	838.9

RF = 613451(500) / 376682(890)

~~0.97752~~
0.914923

2/18/13
TC

TestAmerica Burlington

Alkyl Tin Quantitation Report

Data file : /var/chem/2860_1.i/121112_1/11DEC121742.b/11dec121742-r091.d
Lab Smp Id: ICV-406260 Client Smp ID: ICV
Inj Date : 11-DEC-2012 19:59
Operator : RRM Inst ID: 2860_1.i
Smp Info : ICV-406260,1,ICV
Misc Info :
Comment :
Method : /var/chem/2860_1.i/121112_1/11DEC121742.b/OR560_RTX35.m
Meth Date : 12-Dec-2012 09:25 rrm Quant Type: ISTD
Cal Date : 11-DEC-2012 19:26 Cal File: 11dec121742-r071.d
Als bottle: 1 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: ICV.sub
Target Version: 3.50 Sample Matrix: WATER
Processing Host: chemsvr5

Concentration Formula: Amt * DF * Vi/Vi * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Vi	1.50000	Volume injected (uL)

Cpnd Variable Local Compound Variable

RT	EXP RT	(REL RT)	RESPONSE	CONCENTRATIONS ON-COL (ug/L)	FINAL (ug/L)
* 1 Tetra-n-propyl tin					CAS #: 2176-98-9
1.988	2.015	(1.000)	367479	500.000	
2 Tetrabutyltin					CAS #: 1461-25-2
4.455	4.475	(2.241)	162409	285.391	285.4
3 Tributyltin					CAS #: 688-73-3
5.488	5.508	(2.760)	138228	192.413	192.4
4 Dibutyltin					CAS #: 1002-53-5
6.382	6.402	(3.210)	176191	223.076	223.1
$ 5 Tripentyltin					CAS #: 3342-67-4
6.743	6.761	(3.391)	126458	230.340	230.3

CCV

RF: 138228 (500) / 367479 (223)

0.843

2/18/13
TC

FORM VII
GC SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 480-29598-1

SDG No.:

Lab Sample ID: CCV 200-50011/13 Calibration Date: 12/26/2012 14:35

Instrument ID: 2860.i Calib Start Date: 12/17/2012 15:29

GC Column: RTX-35 ID: 0.32(mm) Calib End Date: 12/17/2012 16:37

Lab File ID: 26dec121110-r131.d Conc. Units: ug/L

EPA Sample No.: 250 PPB

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Tetrabutyltin	Ave	0.6708	0.7430		277	250	10.8	25.0
Tributyltin	Ave	0.7585	0.9717		285	223	28.1*	25.0
Dibutyltin	Ave	0.7588	1.007		255	193	32.6*	25.0
Monobutyltin	Ave	0.7294	0.9086		193	155	24.6	25.0
Tripentyltin	Ave	0.5302	0.6432		279	230	21.3	25.0

RTX-5 column %D was 2.3

No Quals given

2/18/13 TC

FORM I
GC SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington
Job No.: 480-29598-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 200-49268/2-A
Matrix: Solid
Lab File ID: 11dec121807-r101.d
Analysis Method: Organotins/GC
Date Collected:
Extraction Method: 3550C
Date Extracted: 12/10/2012 18:10
Sample wt/vol: 30.00(g)
Date Analyzed: 12/11/2012 22:48
Con. Extract Vol.: 1000(uL)
Dilution Factor: 1
Injection Volume: 1.5(uL)
GC Column: RTX-5
ID: 0.32(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 49448
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
688-73-3	Tributyltin	12.5		1.5	0.67

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00386	Tripentyltin	77		30-120

$\frac{375\ ng}{L} \times \frac{.001L}{30g} = 0.0125\ ug/g$

$\frac{12.5\ ug/Kg}{14.8}$

84% Rec

TC
2/18/13

FORM I
GC SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington
Job No.: 480-29598-1
SDG No.:
Client Sample ID: OC-SB-528-1.0/3.0-XXX MS
Lab Sample ID: 480-29598-8 MS
Matrix: Solid
Lab File ID: 26dec121110-r071.d
Analysis Method: Organotins/GC
Date Collected: 12/05/2012 14:05
Extraction Method: 3550C
Date Extracted: 12/22/2012 08:12
Sample wt/vol: 29.67(g)
Date Analyzed: 12/26/2012 12:54
Con. Extract Vol.: 1000(uL)
Dilution Factor: 1
Injection Volume: 1.5(uL)
GC Column: RTX-5 ID: 0.32(mm)
% Moisture: 64.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 50011
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
688-73-3	Tributyltin	29.2		4.2	1.9

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00386	Tripentyltin	68		30-120

MS Calc check

$\frac{310.5\,ug}{L} \times \frac{.01L}{.02967Kg} = \frac{104.65\,ug/Kg}{0.359\,\%Solid}$

291.5 ug/Kg

✓

2/18/13
TC

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 SDG 480-29598-1
Date: 2-7-13 Reviewer: Tige Cunningham

☑ **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

OK ✓

2. **Holding Time and Sample Preservation (30 days to digest, 7 days to analyze digestate)**

OK

3. **QC Blanks**

Method blank clean < 2.0

CCB @ low levels 0.544 mg/L - 0.379 no effect on samples

4. **Laboratory Control Sample Review (% recovery 80-120, RPD 20)**

w/ in Limits 100, 104%

pH = 100%
ORP = 89%

5. **Field Duplicate Precision (RPD 50)**

Not reported in this SDG

6. **Lab Duplicate Precision (RPD 35)**

OC-SB-526-1.0/3.0-XXY

7. **Matrix Spike Results (if applicable) (% recovery 75-125, RPD 35)**

OC-SB-526-1.0/3.0-XXY used. Spikes w/ in limits 88%, 98%, 103%

8. **Surrogate Recovery (if applicable)**

Not applicable.

9. **Internal Standard Recovery (if applicable)**

Not applicable.

5-IN
MATRIX SPIKE SOLUBLE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-29598-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 139572		Date: 12/12/2012 23:44	Prep Batch: 139400			Date: 12/12/2012 11:54					
7199	480-29598-4	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29598-4 MSS	Chromium (hexavalent)	47.1		mg/Kg	53.4	88	75-125			
Batch ID: 139572		Date: 12/13/2012 00:00	Prep Batch: 139400			Date: 12/12/2012 11:54					
7199	480-29598-4	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29598-4 MSI	Chromium (hexavalent)	930		mg/Kg	946	98	75-125			
Batch ID: 139572		Date: 12/13/2012 00:17	Prep Batch: 139400			Date: 12/12/2012 11:54					
7199	480-29598-4	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29598-4 PDS	Chromium (hexavalent)	55.0		mg/Kg	53.4	103	85-115			

ORP = 82mV
pH = 4.33

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 V-IN

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: OC-SB-528-0.0/1.0-XXX
Lab Sample ID: 480-29598-7
Lab Name: TestAmerica Edison
Job No.: 480-29598-1
SDG ID.:
Matrix: Solid
Date Sampled: 12/05/2012 14:00
Reporting Basis: DRY
Date Received: 12/05/2012 18:15
% Solids: 27.0

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Chromium (hexavalent)	19	7.7	5.6	mg/Kg			10	7199

$12.716\ mg/L \times \frac{.1L}{2.42g} \times \frac{10}{.27\%\ Solid} = 19.46\ mg/kg$

✓

2/7/13
TC

SDG 480-29598-1	Cr+6 Line from 12/13/2012		
Std Level	**Cr+6 Std Conc (ppb)**	**Area Response Cr+6**	
1	5	15.99	
2	10	34	
3	25	84.72	
4	50	170.98	
	y	x	
	Cr+6		
slope	0.290862647	0.286746954	**intercept**
+-	0.000881656	0.085717099	+-
r2	0.999981624	0.106090209	**s(y)**
F	108837.2335	2	**degrees of freedom**
regression ss	1224.97749	0.022510265	**residual ss**
480-29598-7 (OC-SB-528-0.0/1.0-XXX)			
Cr+6			
Response	42.731		
Amount Found (ug/l)	12.716		
Final Conc mg/kg dry	12.716 ug/L X .1L/2.42g X 10 / .27 = 19.46 mg/kg		

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~~ Irvine, CA
Date: _____ Reviewer: Tige Cunningham

☑ **Chemist Review** ~~**Full Validation (add page 2)**~~ (TC) Edison NJ analyzed a subset of samples SDG 480-298951-1

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

OK ✓

% Solid Calculation check done on sample OC-SB-507-0.0/1.0xxx

2. **Holding Time and Sample Preservation (30 days to digest, 7 days to analyze digestate)**

extracted w/in hold time

3. **QC Blanks**

TAL-Irvine, TAL-Edison } OK ✓

4. **Laboratory Control Sample Review (% recovery 80-120, RPD 20)**

TAL-Irvine: OK ✓

TAL-Edison: OK ✓

TAL-NJ: pH/ORP = OK

5. **Field Duplicate Precision (RPD 50)**

Not submitted w/ this SDG

6. **Lab Duplicate Precision (RPD 35)**

TAL-Irvine = Not Performed

TAL-Edison = OK

TAL-Edison
OC-SB-503-6.0/8.0-xxx
recoveries w/in limits 86-104%

7. **Matrix Spike Results (if applicable) (% recovery 75-125, RPD 35)**

TAL-Irvine: OC-SB-506-6.0/8.0-XXX MS 68% Recovery
MSD 67%

pH = 6.07
ORP = 47mV

low MS recovery due to reducing conditions, no Quals

8. **Surrogate Recovery (if applicable)**

Not applicable.

insoluble spike was @ 67%

9. **Internal Standard Recovery (if applicable)**

Not applicable.

5-IN
MATRIX SPIKE SOLUBLE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-29895-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 140645		Date: 12/18/2012 14:41	Prep Batch:		140233	Date: 12/17/2012 11:03					
7199	480-29895-B-2 -C ^40	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29895-B-2 -C MSS ^40 MSS	Chromium (hexavalent)	42.2		mg/Kg	49.3	86	75-125			Soluble
Batch ID: 140645		Date: 12/18/2012 15:06	Prep Batch:		140233	Date: 12/17/2012 11:03					
7199	480-29895-B-2 -D ^500	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29895-B-2 -D MSI ^500 MSI	Chromium (hexavalent)	799		mg/Kg	873	92	75-125			Insoluble
Batch ID: 140645		Date: 12/18/2012 15:23	Prep Batch:		140233	Date: 12/17/2012 11:03					
7199	480-29895-B-2 -A ^40	Chromium (hexavalent)	ND		mg/Kg						
7199	480-29895-B-2 -A PDS ^40 PDS	Chromium (hexavalent)	51.5		mg/Kg	49.3	104	85-115			PDS

Recoveries w/ in Limits

pH: 6.01
ORP: 47 mV

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 V-IN

FORM III
HPLC/IC MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-29895-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: 480-29895-5 MS Client ID: OC-SB-506-6.0/8.0-XXX MS

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	MS CONCENTRATION (mg/Kg)	MS % REC	QC LIMITS REC	#
Cr (VI)	18.6	ND	12.7	68	55-110	

ORP: 47 mV

pH = 6.07

Low recoveries potentially due to reducing conditions in the soil present, no Qual assigned.

Soluble { MS % Rec = 68
MSD % Rec = 67

Insoluble MS% Rec = 68

Column to be used to flag recovery and RPD values

FORM III 7199

TC
2/8/13

TestAmerica Irvine
Target Compound Quantitation Report

Data File:	\\Irvchrom\ChromData\IC16\20130102-16949.b\Info 2_TAIIRV167_Hex Chrom_20130102-224326.d		
Lims ID:	480-29895-B-4-B	Client ID:	OC-SB-506-0.0/1.0-XXX
Inject. Date:	02-Jan-2013 22:30:00	Dil. Factor:	10.0000
Sample Type:	Client		
Sample ID:	440-0016949-038		
Misc. Info.:	440-0016949-038		
Operator:	irvinorg	Instrument ID:	IC-16
Injection Vol:	1.0 ul	ALS Bottle#:	0
Lims Batch ID:	76515	Lims Sample ID:	38
Raw Data:	Smoothed		
Detector:	GC Info 2_TAIIRV167_Hex Chrom_20130102-224326		
Method:	\\Irvchrom\ChromData\IC16\20130102-16949.b\218.6_16.m		
Method Label:	HEX CHROME		
Last Update:	02-Jan-2013 23:19:54	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:	XAWRK033		

Compound	RT	EXP RT	DLT RT	Response	On-Col Amt ug/l	Flags
1 Cr (VI)	8.122	8.262	-0.140	872058	22.9	

TAL-Irvine
Sample Calculation
check

$$\frac{22.9\,\mu g}{L} \times \frac{.05L}{.00124kg} \times 10 = \frac{9.233\,mg/kg}{.848} = 10.88$$

11 mg/kg

84.8% Solid

✓

TC
2/11/13

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-29895-1

SDG No.:

Batch Number: 95294 Batch Start Date: 12/11/12 18:46 Batch Analyst: Doyle, Matthew

Batch Method: Moisture Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
480-29963-A-1	OC-SB-507-0.0/1.0-XXX	Moisture	T	62	4.30 g	13.84 g	13.16 g		
480-29963-A-2	OC-SB-507-6.0/8.0-XXX	Moisture	T	63	4.30 g	13.92 g	13.17 g		
480-29963-A-3	OC-SB-507-13/15-XXX	Moisture	T	64	4.30 g	17.85 g	15.70 g		

Batch Notes	
Batch Comment	pp-fh-05-12 4.30
Date samples were placed in the oven	12/11/12
Time samples were place in the oven	2000

Basis	Basis Description
T	Total/NA

% Solid Calcheck

13.84g
- 4.30g
9.54 soil wet
8.86 soil dry

$\frac{9.54}{8.86} = 0.9287$

93% Solid
7% water

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.

Moisture

TC 2/11/13

Cunningham, Tige L.

Subject: FW: Olin Wilm: SDG 480-29895-1 - Inconsistent % moisture values.

From: Mason, Becky [mailto:Becky.Mason@testamericainc.com]
Sent: Friday, February 15, 2013 2:44 PM
To: Cunningham, Tige L.
Cc: Thompson, Peter H.; Ricardi, Christian S.
Subject: RE: Olin Wilm: SDG 480-29895-1 - Inconsistent % moisture values.

Hi Tige

We looked at all sample bottles and looked at the results. We do not think any samples were switched. We think the variation is just due to the variability of soil samples.

Becky

From: Cunningham, Tige L. [mailto:Tige.Cunningham@amec.com]
Sent: Monday, February 11, 2013 2:59 PM
To: Mason, Becky
Cc: Thompson, Peter H.; Ricardi, Christian S.
Subject: Olin Wilm: SDG 480-29895-1 - Inconsistent % moisture values.

Hi Becky
I was looking at the percent moisture values for analyses completed by TAL-IRV and Buffalo. The %moisture for OC-SB-507-0.0/1.0-XXX reported by the two labs looks good (92% and 93%). The other two samples are way off. It looks like one of the labs switched the samples (i.e SB-507-6/8 from Irvine is closer to SB-507-13/15 from Buffalo). I'm concerned that if a sample was switched for Percent moisture then maybe the sample was switched for one of the other analyses as well, plus the percent moisture effects that final concentration of the reported results for Cr+6 and ETPH.
Can you look into this and let me know if samples were switched?

lab_id	sample_no	analysis_no	SDG	method	lab_sample_id	field_sample_id	param_name	final_result
TA-IRV	224108	823783	480-29895-1	E160.3	480-29895-13	OC-SB-507-0.0/1.0-XXX	Percent Moisture	8.1
TA-IRV	224108	823783	480-29895-1	E160.3	480-29895-13	OC-SB-507-0.0/1.0-XXX	Percent Solids	92
TA-IRV	224110	823797	480-29895-	E160.3	480-29895-14	OC-SB-507-6.0/8.0-	Percent	20

			1			XXX	Moisture	
TA-IRV	224110	823797	480-29895-1	E160.3	480-29895-14	OC-SB-507-6.0/8.0-XXX	Percent Solids	80
TA-IRV	224109	823790	480-29895-1	E160.3	480-29895-15	OC-SB-507-13/15-XXX	Percent Moisture	10
TA-IRV	224109	823790	480-29895-1	E160.3	480-29895-15	OC-SB-507-13/15-XXX	Percent Solids	90
TALBFLO	224108	823780	480-29895-1	E160.3	480-29963-1	OC-SB-507-0.0/1.0-XXX	Percent Moisture	7.1
TALBFLO	224108	823780	480-29895-1	E160.3	480-29963-1	OC-SB-507-0.0/1.0-XXX	Percent Solids	93
TALBFLO	224110	823794	480-29895-1	E160.3	480-29963-2	OC-SB-507-6.0/8.0-XXX	Percent Moisture	7.8
TALBFLO	224110	823794	480-29895-1	E160.3	480-29963-2	OC-SB-507-6.0/8.0-XXX	Percent Solids	92
TALBFLO	224109	823787	480-29895-1	E160.3	480-29963-3	OC-SB-507-13/15-XXX	Percent Moisture	16
TALBFLO	224109	823787	480-29895-1	E160.3	480-29963-3	OC-SB-507-13/15-XXX	Percent Solids	84

Tige Cunningham, NRCC EAC
Project Scientist
AMEC Environment & Infrastructure (Formerly MACTEC)
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OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
EXTRACTABLE PETROLEUM HYDROCARBONS BY METHOD MADEP-EPH-98-1

Reviewer/Date Tige Cunningham 2/11/13
Sr. Review/Date
Lab Report # 480-29895-1
~~LAW~~ Project # 6107130016-10

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* [✓] *Certification ID #* [✓] *Address* [✓] *Project ID* [✓] *Phone #* [✓] *Sample identification – Field and Laboratory*

Client Information: [✓] *Name* [✓] *Address* [✓] *Phone #* [✓] *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: *Are both of the following statements true?* **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) **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include the *original* 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 missing original 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 ☑ Custody seals checked ☑ 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:

Water - 1 Liter amber bottle / 5 ml 1:1 HCl, cool to 4°C
Soil - 4 oz amber soil jar w/ Teflon lined cap / 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

ACTION: If each VOA vial for a sample contains air bubbles or the VOA vial analyzed contained air bubbles, flag positives (J) and reject nondetects (R).

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)

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 analyzed) ☐ Laboratory duplicate results (where applicable) (Not analyzed) ☑ 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? For water samples, the holding time is 14 days from sampling to extraction and 40 days from extraction to analysis. For soil samples, the holding time is 7 days from sampling to extraction and 40 days from extraction to analysis.

NOTE: List samples that exceeded hold time with number of days exceeded on checklist.

ACTION: If technical holding times are exceeded, qualify all positive results (J) and reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? **Yes** [✓] No [ ] N/A [ ] Comments:

Extractable Petroleum Hydrocarbons MADEP-EPH-98-1

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 **Yes** [✓] No [ ] N/A [ ] Comments:

☐ SOW ☑ QAPP ☐ Lab?

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 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 Was a method blank analyzed for each analysis batch of EPH 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 attached table for PQLs) Yes [ ] **No** [✓] N/A [ ] Comments:

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

If the sample concentration is < 5 × blank value, flag sample result "JB"

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 Standard

5.1 Was a laboratory control standard 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, reject (R) data 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 of 40-140%? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: *A second source LCS containing at least five target analytes from each fraction is required by MADEP.*

NOTE: *MADEP guidelines list LCS recovery limits as 40-140 for all analytes except C36. The laboratory must identify analytes that routinely exceed these limits. See the attached table for a listing of MADEP LCS control limits vs. the control limits listed in the QAPP.*

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%, positive and non-detect results are rejected (R) unless the QC limit for that compound is below 10% (flag as above).

5.4 Are 80% of LCS recoveries within laboratory control limits? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If 80% of LCS recoveries are not within limits, use professional judgment and consult Senior Chemist. If more than half of the recoveries are above control limits, qualify all positive results as (J). If more than half of the recoveries are below control limits, batch may require rejection and reanalysis

6.0 Matrix Spikes

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

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

Yes [ ] No [ ] N/A [✓] Comments: Samples Not submitted for ms/msD

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?

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

Yes [ ] No [ ] N/A [✓] Comments:

6.4 Are any EPH 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: *A second source MS/MSD containing at least five target analytes from each fraction is required by MADEP.*

NOTE: *MADEP guidelines list MS/MSD recovery limits as 40-140 for all analytes except C36. The laboratory must identify analytes that routinely exceed these limits. See the attached table for a listing of MADEP LCS control limits vs. the control limits listed in the QAPP*

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.

NOTE: 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.

ACTION: MS/MSD flags only apply to the sample spiked. 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).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits of ≤ *50 for soil and ≤ 30 for water*? 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: *MADEP guidelines list MS/MSD RPD limits for water and soil as ≤ 50. See the attached table for a listing of MADEP MS/MSD RPD limits vs. the control limits listed in the QAPP.*

NOTE: 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 are evaluated, but no flags are applied.

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

7.0 Surrogate Recoveries

Were one or more EPH surrogate recoveries outside of laboratory limits for any sample or method blank? If yes, were samples re-analyzed? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: %R = QD x 100% Where: S = MS sample result
D = MSD sample result

NOTE: *MADEP guidelines require at least two extraction and two fractionation surrogates, and lists recovery limits as 40-140% for all surrogates. See the attached table for a listing of MADEP surrogate limits vs. the control limits listed in the QAPP*

NOTE: If surrogate recoveries fail due to dilution, results are not flagged. Document on checklist and in the case narrative.

O-Terphenyl out high @ 160%
In sample OC-SB-507-0.0/1.0-XXX
no detections no Quals.

ACTION: If recoveries are >10%, but fail to meet QC criteria: (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 QC limits are below 10%, in which case, results are flagged as stated above), flag positives (J) and reject nondetects (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:

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

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

ACTION: Evaluate rinsate results against other blank results to determine if contaminant may be laboratory-, ambient, or shipment-derived. If results are not lab-, ambient, or shipment related, qualify according to the table below.

Sample conc. < 5x blank value:	Sample conc. > 5x blank value:
Flag sample result "JB"	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 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 waters? Calculate the RPD for all results and attach to this review. **Yes [ ]** No [ ] N/A [✓] Comments:

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

10.0 Application of Validation Qualifiers

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.

USEPA, 1988. "Laboratory Data Validation Functional Guidelines for Evaluating Organic and Inorganic Analysis," EPA/540/R-94-012 and EPA/540-R-94-013, July 1988.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance / Quality Control (QA / QC Requirements," BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance / Quality Control Guidelines for Sampling, Data Evaluation and reporting Activities, " BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

FORM II
GC SEMI VOA SURROGATE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-29895-1

SDG No.:

Matrix: Solid Level: Low

GC Column (1): ZB-5 ID: 0.53 (mm) GC Column (2): ZB-5 ID: 0.53 (mm)

Client Sample ID	Lab Sample ID	FBP1 #	2BN1 #	OTPH1 #	1COD2 #
OC-SB-507-0.0/1.0-XXX	480-29963-1	108	108	160 X	132
OC-SB-507-6.0/8.0-XXX	480-29963-2	113	112	82	67
OC-SB-507-13/15-XXX	480-29963-3	112	112	80	58
	MB 480-95358/1-B	99	99	79	71
	LCS 480-95358/2-B	104	103	84	72
	LCSD 480-95358/3-B	105	104	84	70

NO detections reported in
OC-SB-507-0.0/1.0-XXX NO Quals

	QC LIMITS
FBP = 2-Fluorobiphenyl	40-140
2BN = 2-Bromonaphthalene	40-140
OTPH = o-Terphenyl	40-140
1COD = 1-Chlorooctadecane	40-140

Column to be used to flag recovery values

FORM II MA-EPH

TC
2/11/13

2,4,4-Trimethyl-1-Pentene
2,4,4-Trimethyl-2-Pentene

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) See Attached

SITE: Olin Chemical Project #: 6107130016-10 SDG #: 480-29976

LAB #: TAL-Buffalo

Sample IDs: Attach tracking sheet and/or sample listing.

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%	2,4,4-Trimethyl-2-Pentene calculation check
☑	☐	☐	RRF greater than or equal to 0.05	
			Continuing Calibration	
☐	☑	☐	%D less than or equal to 25%	2,4,4 TMP-1 @ 32.6% in CCV on 12/13/12 @ 22:42
☑	☐	☐	RRF greater than or equal to 0.05.	J/UJ associated
			Blank Contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.
☐	☑	☐	Method blank contamination	
☐	☐	☑	Trip blank contamination →	not collected
☐	☐	☑	Equipment/Rinseate blank contamination	NO TIC's in Method Blank

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%)	OC-SB-491-6.0/8.0-xxx W/in Limits
☑	☐	☐	MS/MSD RPD criteria met (water and soil <30%)	
☐	☑	☐	LCS percent recovery criteria (water and soil: 70%-130%)	2,4,4-Trimethyl-2-pentene @ 138% in LCS J Qual result in SB-486-8/10xxx
Field Duplicates				
☑	☐	☐	RPD criteria (water <30%, soils <50%) met	OC-SB-491-6.0/8.0-xxx ; FD was ND
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: 2-13-13

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 VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-29976-1

SDG No.:

Client Sample ID: OC-SB-480-6.0/8.0-XXX | Lab Sample ID: 480-29976-5

Matrix: Solid | Lab File ID: F4308.D

Analysis Method: 8260C | Date Collected: 12/11/2012 10:10

Sample wt/vol: 5.48(g) | Date Analyzed: 12/14/2012 02:50

Soil Aliquot Vol: | Dilution Factor: 1

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

% Moisture: 6.8 | Level: (low/med) Low

Analysis Batch No.: 95715 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
107-39-1	2,4,4-Trimethyl-1-pentene	ND	UJ	4.9	0.42
107-40-4	2,4,4-Trimethyl-2-pentene	ND		4.9	0.52

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	85		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	86		70-130
460-00-4	4-Bromofluorobenzene (Surr)	83		70-130

2/13/13
TC

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-29976-1

SDG No.:

Client Sample ID: OC-SB-486-8.0/10-XXX DL | Lab Sample ID: 480-29976-7 DL

Matrix: Solid | Lab File ID: C25374.D

Analysis Method: 8260C | Date Collected: 12/11/2012 12:15

Sample wt/vol: 9.676(g) | Date Analyzed: 12/17/2012 15:08

Soil Aliquot Vol: 100 (uL) | Dilution Factor: 1

Soil Extract Vol.: 10(mL) | GC Column: ZB-624 (30) ID: 0.53(mm)

% Moisture: 8.8 | Level: (low/med) Medium

Analysis Batch No.: 96178 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
107-39-1	2,4,4-Trimethyl-1-pentene	3700	~~-~~ J	280	24
107-40-4	2,4,4-Trimethyl-2-pentene	850	~~-~~ J	280	30

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	88		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	86		70-130
460-00-4	4-Bromofluorobenzene (Surr)	82		70-130

2/13/13
TC

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-29976-1
SDG No.:
Client Sample ID: OC-SB-491-6.0/8.0-XXX
Lab Sample ID: 480-29976-8
Matrix: Solid
Lab File ID: F4311.D
Analysis Method: 8260C
Date Collected: 12/11/2012 13:00
Sample wt/vol: 5.32(g)
Date Analyzed: 12/14/2012 04:08
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: ZB-624 (60) ID: 0.25(mm)
% Moisture: 4.5
Level: (low/med) Low
Analysis Batch No.: 95715
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
107-39-1	2,4,4-Trimethyl-1-pentene	ND	UJ	4.9	0.42
107-40-4	2,4,4-Trimethyl-2-pentene	ND		4.9	0.52

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	89		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	90		70-130
460-00-4	4-Bromofluorobenzene (Surr)	87		70-130

2/13/13
TC

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-29976-1
SDG No.:
Client Sample ID: OC-DUP-3
Lab Sample ID: 480-29976-9
Matrix: Solid
Lab File ID: F4315.D
Analysis Method: 8260C
Date Collected: 12/11/2012 00:00
Sample wt/vol: 5.37(g)
Date Analyzed: 12/14/2012 05:49
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: ZB-624 (60) ID: 0.25(mm)
% Moisture: 5.3
Level: (low/med) Low
Analysis Batch No.: 95715
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
107-39-1	2,4,4-Trimethyl-1-pentene	ND	UJ	4.9	0.42
107-40-4	2,4,4-Trimethyl-2-pentene	ND		4.9	0.52

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	90		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	92		70-130
460-00-4	4-Bromofluorobenzene (Surr)	87		70-130

2/13/13
TC

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Buffalo Job No.: 480-29976-1

SDG No.:

Lab File ID: C25367.D BFB Injection Date: 12/17/2012

Instrument ID: HP5973C BFB Injection Time: 11:11

Analysis Batch No.: 96178

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	21.5	
75	30.0 - 60.0 % of mass 95	51.2	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.7	
173	Less than 2.0 % of mass 174	0.0	(0.0)1
174	50.0 - 120.00 % of mass 95	71.9	
175	5.0 - 9.0 % of mass 174	5.0	(7.0)1
176	95.0 - 101.0 % of mass 174	71.2	(99.1)1
177	5.0 - 9.0 % of mass 176	4.4	(6.2)2

1-Value is % mass 174 2-Value is % mass 176

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

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 480-96178/2	C25368.D	12/17/2012	11:43
	CCV 480-96178/3	C25369.D	12/17/2012	12:27
~~wlin Limits~~	LCS 480-96180/1-A	C25370.D	12/17/2012	13:15
wlin Limits	LCSD 480-96180/22-A	C25371.D	12/17/2012	13:40
	MB 480-96180/2-A	C25373.D	12/17/2012	14:31
OC-SB-486-8.0/10-XXX DL	480-29976-7 DL	C25374.D	12/17/2012	15:08

2,4,4-Trimethyl-2-pentene @ 138% J Qual diluted result

2/13/13
TC

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-29976-1

SDG No.:

Matrix: Solid Level: Medium Lab File ID: C25370.D

Lab ID: LCS 480-96180/1-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
2,4,4-Trimethyl-1-pentene	2500	2500	100	70-130	
2,4,4-Trimethyl-2-pentene	2500	3460	138	70-130	*

2/13/13
TC

Column to be used to flag recovery and RPD values

FORM III 8260C

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Buffalo Job No.: 480-29976-1

SDG No.:

Lab File ID: F4298.D BFB Injection Date: 12/13/2012

Instrument ID: HP5973F BFB Injection Time: 21:33

Analysis Batch No.: 95715

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	16.9	
75	30.0 - 60.0 % of mass 95	40.8	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	7.2	
173	Less than 2.0 % of mass 174	0.0	(0.0)1
174	50.0 - 120.00 % of mass 95	86.2	
175	5.0 - 9.0 % of mass 174	6.9	(8.0)1
176	95.0 - 101.0 % of mass 174	86.5	(100.4)1
177	5.0 - 9.0 % of mass 176	5.5	(6.3)2

1-Value is % mass 174 2-Value is % mass 176

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

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 480-95715/3	F4299.D	12/13/2012	22:01
	CCV 480-95715/4	F4300.D	12/13/2012	22:42
	LCS 480-95715/5	F4301.D	12/13/2012	23:08
	LCSD 480-95715/6	F4302.D	12/13/2012	23:34
	MB 480-95715/8	F4304.D	12/14/2012	00:25
OC-SB-480-6.0/8.0-XXX	480-29976-5	F4308.D	12/14/2012	02:50
OC-SB-484-5.5/7.5-XXX	480-29976-6	F4309.D	12/14/2012	03:16
OC-SB-486-8.0/10-XXX	480-29976-7	F4310.D	12/14/2012	03:41
OC-SB-491-6.0/8.0-XXX	480-29976-8	F4311.D	12/14/2012	04:08
OC-SB-491-6.0/8.0-XXX MS	480-29976-8 MS	F4312.D	12/14/2012	04:33
OC-SB-491-6.0/8.0-XXX MSD	480-29976-8 MSD	F4313.D	12/14/2012	04:58
OC-DUP-3	480-29976-9	F4315.D	12/14/2012	05:49

%D

2,4,4-trimethyl-1-pentene @ 32.6% J/UJ all associated samples

2/13/13
TC

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

Lab Name: TestAmerica Buffalo Job No.: 480-29976-1 Analy Batch No.: 94870

SDG No.:

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

Calibration Start Date: 12/10/2012 01:38 Calibration End Date: 12/10/2012 03:44 Calibration ID: 11396

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 480-94870/16	C25058.D
Level 2	IC 480-94870/17	C25059.D
Level 3	IC 480-94870/18	C25060.D
Level 4	IC 480-94870/19	C25061.D
Level 5	IC 480-94870/20	C25062.D
Level 6	IC 480-94870/21	C25063.D

Tier 3 calculation check

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	0.3670 0.3345	0.3446	0.3395	0.3391	0.3401	Ave		0.3441				3.4		15.0			
3-Chloro-1-propene	0.5889 0.5494	0.5985	0.5805	0.5592	0.5584	Ave		0.5725				3.4		15.0			
2-Methyl-2-propanol	0.0620 0.0553	0.0588	0.0617	0.0606	0.0606	Ave		0.0598				4.2		15.0			
Halothane	0.2099 0.1578	0.1839	0.1739	0.1660	0.1710	Ave		0.1771				10.0		15.0			
Isopropyl ether	1.3316 1.1586	1.2455	1.2543	1.2215	1.2109	Ave		1.2371				4.6		15.0			
Tert-butyl ethyl ether	1.3184 1.1345	1.2858	1.2513	1.2462	1.2395	Ave		1.2459				5.0		15.0			
Propionitrile	0.0688 0.0648	0.0671	0.0694	0.0689	0.0680	Ave		0.0678				2.5		15.0			
Tert-amyl methyl ether	1.1432 1.0188	1.1048	1.0712	1.0663	1.0800	Ave		1.0807				3.8		15.0			
n-Heptane	0.5531 0.4926	0.5577	0.5358	0.5027	0.5066	Ave		0.5247				5.3		15.0			
2,4,4-Trimethyl-1-pentene	0.3388 0.1638	0.2885	0.2648	0.2381	0.2019	Qua	0.2490	0.2398	-0.001						0.9990		0.9900
2,4,4-Trimethyl-2-pentene	0.7679 0.5339	0.7004	0.6718	0.6277	0.6042	Ave		0.6510				12.0		15.0			
1,4-Dioxane	0.0071 0.0081	0.0075	0.0082	0.0081	0.0082	Ave		0.0079				5.5		15.0			
2-Nitropropane	0.3494 0.3776	0.3386	0.3589	0.3761	0.3783	Ave		0.3631				4.6		15.0			

Level 1 RF: $\frac{20526(25)}{669252(1)} = 0.76789$

Level 3 RF: $\frac{181866(25)}{676736(10)} = 0.6718$

Level 5 $\frac{802567(25)}{664192(50)} = 0.60416$

$\bar{X} = 0.650977$

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

Level 2 RF: $\frac{93411(25)}{666798(5)} = 0.7004$

Level 4 RF: $\frac{419514(25)}{668303(25)} = 0.6277$

Level 6 $\frac{1429418(25)}{669353(100)} = 0.5338$

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-29976-1

SDG No.:

Lab Sample ID: CCV 480-96178/3 Calibration Date: 12/17/2012 12:27

Instrument ID: HP5973C Calib Start Date: 12/10/2012 01:38

GC Column: ZB-624 (30) ID: 0.53(mm) Calib End Date: 12/10/2012 03:44

Lab File ID: C25369.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	0.3441	0.3839		27.9	25.0	11.6	
3-Chloro-1-propene	Ave	0.5725	0.6414		28.0	25.0	12.0	
2-Methyl-2-propanol	Ave	0.0598	0.0611		511	500	2.2	
Halothane	Ave	0.1771	0.1531		21.6	25.0	-13.5	
Isopropyl ether	Ave	1.237	1.360		27.5	25.0	9.9	
Tert-butyl ethyl ether	Ave	1.246	1.289		25.9	25.0	3.5	
Propionitrile	Ave	0.0678	0.0745		274	250	9.8	
Tert-amyl methyl ether	Ave	1.081	1.104		25.5	25.0	2.2	
n-Heptane	Ave	0.5247	0.5886		28.0	25.0	12.2	
2,4,4-Trimethyl-1-pentene	Qua		0.2226		24.1	25.0	-3.7	
2,4,4-Trimethyl-2-pentene	Ave	0.6510	0.6639		25.5	25.0	2.0	
1,4-Dioxane	Ave	0.0079	0.0077		973	1000	-2.7	
2-Nitropropane	Ave	0.3631	0.3267		112	125	-10.0	

Continuing Calibration Calculation Check

$$RF = \frac{402246\,(25)}{605895\,\cancel{(X)}\,25} = 0.66388 \checkmark$$

$$\%D = 1.979 \checkmark$$

FORM VII 8260C

2/13/13
TC

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-29976-1

SDG No.:

Lab Sample ID: CCV 480-95715/4 Calibration Date: 12/13/2012 22:42

Instrument ID: HP5973F Calib Start Date: 12/11/2012 18:50

GC Column: ZB-624 (60) ID: 0.25(mm) Calib End Date: 12/11/2012 23:36

Lab File ID: F4300.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	0.3064	0.3532		57.6	50.0	15.3	20.0
3-Chloro-1-propene	Lin1		0.7049		59.8	50.0	19.6	20.0
2-Methyl-2-propanol	Ave	0.0719	0.0782		1090	1000	8.8	20.0
Halothane	Ave	0.2095	0.2452		58.5	50.0	17.0	20.0
Isopropyl ether	Ave	1.244	1.399		56.2	50.0	12.5	20.0
Tert-butyl ethyl ether	Ave	1.148	1.239		54.0	50.0	8.0	20.0
Propionitrile	Ave	0.0741	0.0833		562	500	12.3	20.0
Tert-amyl methyl ether	Ave	1.011	1.119		55.3	50.0	10.6	20.0
n-Heptane	Ave	0.6203	0.7678		61.9	50.0	23.8*	20.0
2,4,4-Trimethyl-1-pentene	Ave	0.3724	0.4939		66.3	50.0	32.6*	20.0
2,4,4-Trimethyl-2-pentene	Lin1		1.000		61.9	50.0	23.8*	20.0
1,4-Dioxane	Ave	0.0150	0.0161		2150	2000	7.4	20.0
2-Nitropropane	Ave	0.2659	0.2957		278	250	11.2	20.0

> 25% Limit

TC
2/13/13

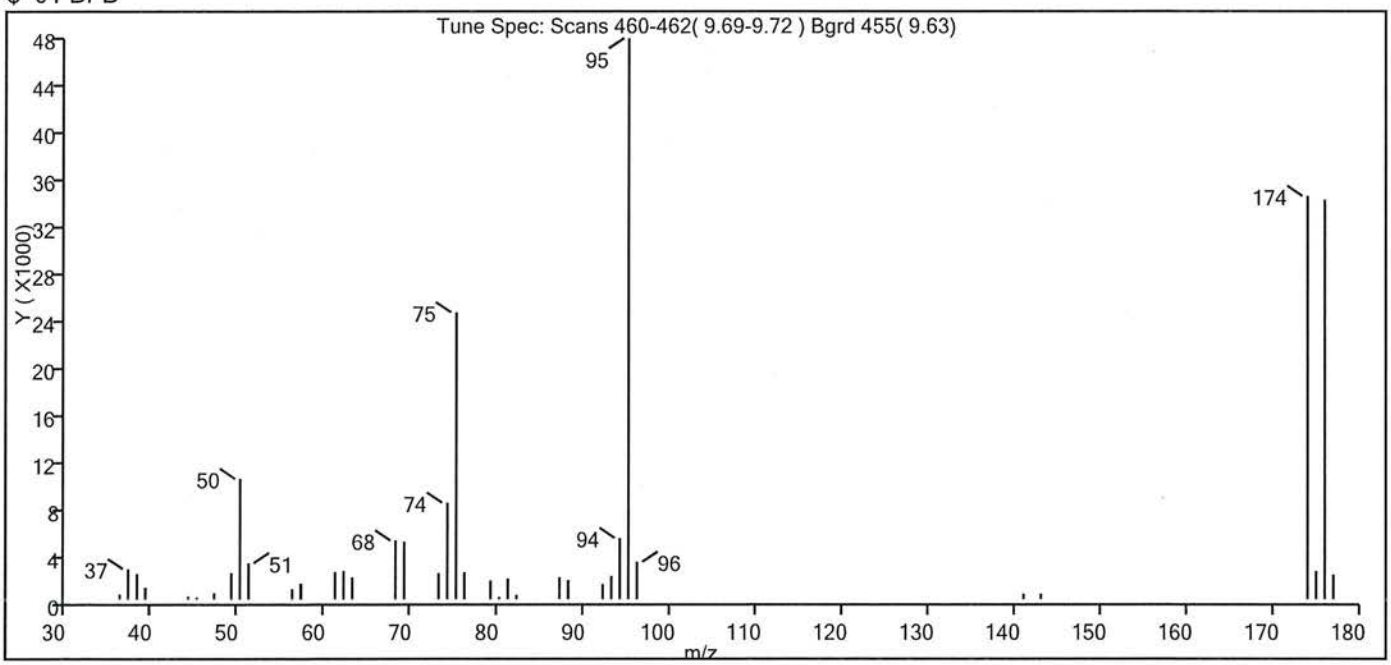
Report Date: 17-Dec-2012 14:23:01 Chrom Revision: 2.0 22-Oct-2012 16:30:48

MS Tune Report

TestAmerica Buffalo

Data File:	\\Bufchrom\ChromData\HP5973C\20121217-17619.b\C25367.D		
Injection Date:	17-Dec-2012 11:11:30	Limit Group:	MV - 8260MCP_RCP
Client ID:		Instrument ID:	HP5973C
Lims Batch ID:	96178	Lims Sample ID:	1
Operator ID:	LH	Purge Vol:	5.000 mL
Column Type:	ZB-624	Column Dia:	0.25 mm
Tune Method:	BFB Method 8260		

$ 61 BFB



m/z	Ion Abundance Criteria	% Relative Abundance
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	21.53
75	30.00 - 60.00% of mass 95	51.16
96	5.00 - 9.00% of mass 95	6.68 ✓
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	71.87
175	5.00 - 9.00% of mass 174	5.03 (7.00)
176	95.00 - 101.00% of mass 174	71.19 (99.05)
177	5.00 - 9.00% of mass 176	4.43 (6.22)

Tune

Tier 3 calculation checks

$\frac{96}{95} = \frac{3145}{47072} = 0.0668$ ✓

$\frac{176}{174} = \frac{33512}{33832} = 0.99054$ ✓

2/13/13
TC

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-29976-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 480-95715/5
Matrix: Solid
Lab File ID: F4301.D
Analysis Method: 8260C
Date Collected:
Sample wt/vol: 5(g)
Date Analyzed: 12/13/2012 23:08
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: ZB-624 (60) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 95715
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
107-39-1	2,4,4-Trimethyl-1-pentene	62.2		5.0	0.43
107-40-4	2,4,4-Trimethyl-2-pentene	56.5		5.0	0.53

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	92		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	88		70-130
460-00-4	4-Bromofluorobenzene (Surr)	89		70-130

LCS calculation Check

2,4,4-Trimethyl-1-pentene

$$.3724 = \frac{\cancel{326379}\ 165478\ (50)}{357453\ (X)} = \frac{62.155}{50} = 124\%\ \text{Recovery}$$

✓

FORM I 8260C

TC
2/13/13

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-29976-1

SDG No.:

Client Sample ID: OC-SB-491-6.0/8.0-XXX MS | Lab Sample ID: 480-29976-8 MS

Matrix: Solid | Lab File ID: F4312.D

Analysis Method: 8260C | Date Collected: 12/11/2012 13:00

Sample wt/vol: 4.71(g) | Date Analyzed: 12/14/2012 04:33

Soil Aliquot Vol: | Dilution Factor: 1

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

% Moisture: 4.5 | Level: (low/med) Low

Analysis Batch No.: 95715 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
107-39-1	2,4,4-Trimethyl-1-pentene	57.3		5.6	0.48
107-40-4	2,4,4-Trimethyl-2-pentene	60.7		5.6	0.59

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	88		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	81		70-130
460-00-4	4-Bromofluorobenzene (Surr)	84		70-130

Matrix Spike Calculation check

$$0.3724 = \frac{142461(50)}{370712(X)} = \frac{51.59\,\mu g}{L} \; \frac{5\,ml}{4.71} = \frac{54.77}{.955\%\,Solid} = 57.354$$

2/13/13
TC

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-29976-1

SDG No.:

Client Sample ID: OC-SB-491-6.0/8.0-XXX MSD | Lab Sample ID: 480-29976-8 MSD

Matrix: Solid | Lab File ID: F4313.D

Analysis Method: 8260C | Date Collected: 12/11/2012 13:00

Sample wt/vol: 4.84(g) | Date Analyzed: 12/14/2012 04:58

Soil Aliquot Vol: | Dilution Factor: 1

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

% Moisture: 4.5 | Level: (low/med) Low

Analysis Batch No.: 95715 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
107-39-1	2,4,4-Trimethyl-1-pentene	52.7		5.4	0.46
107-40-4	2,4,4-Trimethyl-2-pentene	52.3		5.4	0.57

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	87		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	80		70-130
460-00-4	4-Bromofluorobenzene (Surr)	83		70-130

MSD Calculation Check

$$0.3724 = \frac{134371(50)}{369915(X)} = 48.77 \times \frac{5ml}{4.84} \times \frac{1}{.955} = 52.75$$

TC
2/13/13

TestAmerica Buffalo
Target Compound Quantitation Report

Data File:	\\Bufchrom\ChromData\HP5973C\20121217-17619.b\C25374.D		
Lims ID:	480-29976-B-7-B	Client ID:	OC-SB-486-8.0/10-XXX
Inject. Date:	17-Dec-2012 15:08:30	Dil. Factor:	1.0000
Sample Type:	Client		
Sample ID:	480-29976-B-7-B		
Misc. Info.:	480-0017619-009		
Operator:	LH	Instrument ID:	HP5973C
Purge Vol:	5.000 mL	ALS Bottle#:	60
Lims Batch ID:	96178	Lims Sample ID:	9
Detector:	MS SCAN		
Method:	\\Bufchrom\ChromData\HP5973C\20121217-17619.b\C-8260.m		
Last Update:	17-Dec-2012 21:31:58	Calib Date:	10-Dec-2012 03:44:30
Quant Method:	Internal Standard	Quant By:	Initial Calibration
Last ICal File:	\\Bufchrom\ChromData\HP5973C\20121208-17365.b\C25063.D		
Limit Group:	MV - 8260MCP_RCP		
Integrator:	RTE	ID Type:	Deconvolution ID
Column Type:	ZB-624	Column Dia:	0.25 mm
Process Host:	XAWRK018		

First Level Reviewer: quirkp Date: 17-Dec-2012 21:31:58

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/L	Flags
* 1 1,4-Difluorobenzene	114	9.588	9.588	0.0	96	615208	25.0	
* 2 Chlorobenzene-d5	82	11.959	11.971	-0.012	90	340730	25.0	
* 3 1,4-Dichlorobenzene-d4	152	14.011	14.011	0.0	94	296041	25.0	
$ 4 1,2-Dichloroethane-d4 (Surr)	67	9.339	9.339	0.0	0	122561	21.4	
$ 5 Toluene-d8 (Surr)	98	10.774	10.785	-0.011	94	663119	21.9	
$ 6 4-Bromofluorobenzene (Surr)	174	12.920	12.920	0.0	84	196654	20.5	
10 Dichlorodifluoromethane	85		4.607					
12 Chloromethane	50		5.034					
13 Vinyl chloride	62		5.235					
14 Bromomethane	94		5.876					
15 Chloroethane	64		6.006					
17 Trichlorofluoromethane	101		6.338					
18 Ethyl ether	59		6.659					
21 1,1,2-Trichloro-1,2,2-trifluoroe	101		6.919					
22 1,1-Dichloroethene	96		6.990					
23 Acetone	43		7.062					
26 Carbon disulfide	76		7.322					
27 Methyl acetate	43		7.346					
30 Methylene Chloride	84		7.524					
32 Methyl tert-butyl ether	73		7.690					
34 trans-1,2-Dichloroethene	96		7.761					
36 Isopropyl ether	45		8.058					
39 1,1-Dichloroethane	63		8.153					
41 Tert-butyl ethyl ether	59		8.366					
43 2-Butanone (MEK)	43		8.615					
44 2,2-Dichloropropane	77		8.651					
45 cis-1,2-Dichloroethene	96		8.651					
48 Chlorobromomethane	128		8.888					
49 Tetrahydrofuran	42		8.888					
50 Chloroform	83		8.888					

Sample Calculation check

2,4,4-Trimethyl-2-pentene

$$0.65097 = \frac{241338(25)}{615208(x)} = 15.065\ \mu g/L$$

$$\frac{15.065\ \mu g}{L} \times \frac{(10\ mls\ MeOH)(5)(1000)}{(0.912)(9.676\ g)\ 100\ mL} =$$

853.5 µg/kg dry

2/13/13
TC

Compound	Sig	RT	ADJ RT	DLT RT	Q	Response	On-Col Amt ug/kg	Flags
51 1,1,1-Trichloroethane	97		5.018					
52 Cyclohexane	56		5.049					
54 1,1-Dichloropropene	75		5.140					
55 Carbon tetrachloride	117		5.146					
57 Benzene	78		5.328					
56 Tert-amyl methyl ether	73		5.347					
58 1,2-Dichloroethane	62		5.365					
136 2,4,4-Trimethyl-1-pentene	55	5.730	5.736	-0.006	0	4733	1.84	
62 Trichloroethene	95		5.852					
135 2,4,4-Trimethyl-2-pentene	97		5.918					
64 Methylcyclohexane	83		5.985					
65 1,2-Dichloropropane	63		6.077					
66 1,4-Dioxane	88		6.174					
67 Dibromomethane	93		6.211					
68 Dichlorobromomethane	83		6.320					
72 cis-1,3-Dichloropropene	75		6.697					
73 4-Methyl-2-pentanone (MIBK)	43		6.801					9
74 Toluene	92		6.995					9
77 trans-1,3-Dichloropropene	75		7.214					
79 1,1,2-Trichloroethane	83		7.415					
81 Tetrachloroethene	166		7.519					
82 1,3-Dichloropropane	76		7.585					
80 2-Hexanone	43		7.592					
83 Chlorodibromomethane	129		7.829					
84 Ethylene Dibromide	107		7.957					
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		9.046					
95 Bromoform	173		9.319					
94 Isopropylbenzene	105		9.386					
97 1,1,2,2-Tetrachloroethane	83		9.757					
101 Bromobenzene	156		9.769					
99 N-Propylbenzene	91		9.800					9
100 1,2,3-Trichloropropane	110		9.812					9
103 2-Chlorotoluene	126		9.928					9
102 1,3,5-Trimethylbenzene	105		9.964					
105 4-Chlorotoluene	126		10.031					9
106 tert-Butylbenzene	134		10.281					
107 1,2,4-Trimethylbenzene	105		10.329					
109 sec-Butylbenzene	105		10.481					9
110 4-Isopropyltoluene	119		10.603					9
111 1,3-Dichlorobenzene	146		10.639					9
113 1,4-Dichlorobenzene	146		10.725					9
115 n-Butylbenzene	91		10.974					9
116 1,2-Dichlorobenzene	146		11.065					9
117 1,2-Dibromo-3-Chloropropane	75		11.741					
119 1,2,4-Trichlorobenzene	180		12.385					
120 Hexachlorobutadiene	225		12.483					9
121 Naphthalene	128		12.623					9

Sample Calculation Check

OC-SB-484-5.5/7.5 1 xxx

$0.3724 = \frac{4733\ (50)}{345039\ (x)} = 1.84\ ug/L$

$\frac{1.84\ ug}{L} \times \frac{5\ mL}{6.6\ g} \times \frac{1}{.877} = 1.589\ ug/kg$

1.6 ug/kg on Form I

OK ✓

2/13/13
TC

VOLATILE/SEMIVOLATILE ORGANICS

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

TIER III

SITE: Olin Wilmington Project #: 6107130016-10 SDG #: 480-29976

LAB #: TAL-Buffalo

Sample IDs: Attach tracking sheet and/or sample listing.

Tier 3 samples = OC-SB-486-8.0/10-XXX and OC-SB-484-5.5/7.5-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.	OK
☑	☐	☐	Check the raw data including extraction and instrument run logs to verify reported sample extraction and analysis dates.	OK
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. OK	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. OK	
☑	☐	☐	If possible, verify that spectra were generated using appropriate background subtraction techniques. OK	
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.	2,4,4-2-TMP Calculated
☑	☐	☐	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)

Yes	No	N/A	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.	Not provided
☐	☐	☑	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.	2,4,4-TMP-2 checked
☑	☐	☐	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.	Not provide by Lab
☐	☐	☑	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)

Yes	No	N/A	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.
☐	☐	☑	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.	
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	Both Sample & FD were ND

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

Yes	No	N/A	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.
☐	☐	☑	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. Not provided	
☑	☐	☐	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.	
☑ OK	☐	☐	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	

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Criteria and Qualifications: REGION I Organics Guideline (1996)

TIER III

Yes	No	N/A		
			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.	244-TMP-2
☑	☐	☐	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.	
☑	☐	☐	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.	No TIC's reported in Method Blank
☑	☐	☐	Examine all TIC mass spectra in every sample and blank.	Common lab contaminants: CO2, siloxanes, diethyl ether, hexane,certain freons, and phthalates. 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. No unknowns reported	

Yes	NO	N/A	TIER III	
☑	☐	☐	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)				
☐	☐	☐	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	

N/A

Yes	NO	N/A	TIER III	
			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.	
☐	☐	☑	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				
☐	☐	☑	Evaluate all PES and other relevant QC data to determine if any analytical trends exist over the sample analysis period.	
☐	☐	☑	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	

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

TIER III

Yes	No	N/A	
			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

Done

OK

Done

Done

VOLATILE/SEMIVOLATILE ORGANICS

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

Done

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.	
☑	☐	☐	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.	Two instruments were HP5973F HP5973C
☑	☐	☐	Assess whether problematic blank results are reproducible when replicate aliquots are analyzed or are sporadic interferences.	

Validator's Signature: [signature]

Date: 2/14/13

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.

DATA VALIDATION MDL STUDY REVIEW
OLIN OU1 Soil November/December 2012

Analyte	Units	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	MDL8	MDL9	Average	Standard Deviation	*MDL (T*SD)	MDL reported by the lab
2,4,4-Trimethyl-2-pentene	µg/Kg	4.04	4.128	4.089	4.091	3.668	3.871	3.879			3.96657	0.167267	0.526	0.526
2,4,4-Trimethyl-1-pentene	µg/Kg	3.057	2.979	2.887	2.779	2.663	2.857	2.991			2.88757	0.135964	0.427	0.427

Instrument HP5973F

* = 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
Is Spike Conc. > 10x MDL?	N	Y = failure

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~~ TAL-Irvine
Date: 2-12-13 Reviewer: Tiye Cunningham
SDG # 480-29976-1 TAL Westfield

☑ **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

OK ✓

2. **Holding Time and Sample Preservation (30 days to digest, 7 days to analyze digestate)**

OK ✓

3. **QC Blanks**

Cr^{+6}: < RL of 0.20 mg/kg for Method Blank
CCB were all ND

4. **Laboratory Control Sample Review (% recovery 80-120, RPD 20)**

* Cr^{+6} = 79% J/UJ Qual all Cr^{+6} Results
pH = 99% } OK
ORP = 88%

5. **Field Duplicate Precision (RPD 50)**

Not collected w/ samples in this SDG

6. **Lab Duplicate Precision (RPD 35)**

Cr^{+6}: Not analyzed

pH SB-508 RPD = 3 ORP SB-508 RPD = 7

7. **Matrix Spike Results (if applicable) (% recovery 75-125, RPD 35)**

* Cr^{+6} = OC-SB-504-7.5/9.5-xxx MS = 76% MSD = 74% J/UJ
pH of sample = 7.11 Matrix insoluable = 71% Recovery
ORP of sample = 26mV

8. **Surrogate Recovery (if applicable)**

Not applicable.

9. **Internal Standard Recovery (if applicable)**

Not applicable.

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine | Job No.: 480-29976-1

SDG No.:

Client Sample ID: OC-SB-504-0.0/1.0-XXX | Lab Sample ID: 480-29976-1

Matrix: Solid | Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199 | Date Collected: 12/11/2012 08:05

Extraction Method: 3060A | Date Extracted: 01/04/2013 10:56

Sample wt/vol: 1.25(g) | Date Analyzed: 01/05/2013 03:06

Con. Extract Vol.: 50(mL) | Dilution Factor: 10

Injection Volume: 1(uL) | GC Column: AS7 ID: 4(mm)

% Moisture: 27.2 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 77008 | Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.29	J	0.27	0.21

FORM I 7199

TC
2/12/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-29976-1
SDG No.:
Client Sample ID: OC-SB-504-7.5/9.5-XXX
Lab Sample ID: 480-29976-2
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/11/2012 08:30
Extraction Method: 3060A
Date Extracted: 01/04/2013 10:56
Sample wt/vol: 1.24(g)
Date Analyzed: 01/05/2013 03:18
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 22.8
GPC Cleanup:(Y/N) N
Analysis Batch No.: 77008
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	ND	UJ	0.26	0.20

TC
2/12/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine | Job No.: 480-29976-1

SDG No.:

Client Sample ID: OC-SB-505-0.0/1.0-XXX | Lab Sample ID: 480-29976-3

Matrix: Solid | Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199 | Date Collected: 12/11/2012 09:25

Extraction Method: 3060A | Date Extracted: 01/04/2013 10:56

Sample wt/vol: 1.25(g) | Date Analyzed: 01/05/2013 04:09

Con. Extract Vol.: 50(mL) | Dilution Factor: 10

Injection Volume: 1(uL) | GC Column: AS7 ID: 4(mm)

% Moisture: 4.8 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 77008 | Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.34	J	0.21	0.16

TC
2/12/3

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-29976-1
SDG No.:
Client Sample ID: OC-SB-505-5.0/7.0-XXX
Lab Sample ID: 480-29976-4
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/11/2012 09:45
Extraction Method: 3060A
Date Extracted: 01/04/2013 10:56
Sample wt/vol: 1.25(g)
Date Analyzed: 01/05/2013 04:22
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 27.2
GPC Cleanup:(Y/N) N
Analysis Batch No.: 77008
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.58	J	0.27	0.21

TC
2/12/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-29976-1
SDG No.:
Client Sample ID: OC-SB-508-0.0/1.0-XXX
Lab Sample ID: 480-29976-10
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/11/2012 13:25
Extraction Method: 3060A
Date Extracted: 01/04/2013 10:56
Sample wt/vol: 1.25(g)
Date Analyzed: 01/05/2013 04:34
Con. Extract Vol.: 50(mL)
Dilution Factor: 100
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 33.0
GPC Cleanup:(Y/N) N
Analysis Batch No.: 77008
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	ND	UJ	3.0	2.2

TC
2/12/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-29976-1
SDG No.:
Client Sample ID: OC-SB-508-8.0/10-XXX
Lab Sample ID: 480-29976-11
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/11/2012 13:40
Extraction Method: 3060A
Date Extracted: 01/04/2013 10:56
Sample wt/vol: 1.26(g)
Date Analyzed: 01/05/2013 05:12
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 19.4
GPC Cleanup:(Y/N) N
Analysis Batch No.: 77008
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	1.1	J	0.25	0.18

TC
2/12/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine | Job No.: 480-29976-1

SDG No.:

Client Sample ID: OC-SB-508-12/14-XXX | Lab Sample ID: 480-29976-12

Matrix: Solid | Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199 | Date Collected: 12/11/2012 13:50

Extraction Method: 3060A | Date Extracted: 01/04/2013 10:56

Sample wt/vol: 1.26(g) | Date Analyzed: 01/05/2013 05:25

Con. Extract Vol.: 50(mL) | Dilution Factor: 10

Injection Volume: 1(uL) | GC Column: AS7 ID: 4(mm)

% Moisture: 18.0 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 77008 | Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.26	J	0.24	0.18

TC
2/12/13

FORM III
HPLC/IC LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-29976-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: LCS 440-77069/2-A Client ID:

COMPOUND	SPIKE ADDED (mg/Kg)	LCS CONCENTRATION (mg/Kg)	LCS % REC	QC LIMITS REC	#
Cr (VI)	16.0	12.6	79	65-110	

↓ 80%

J/UJ all samples

Column to be used to flag recovery and RPD values

FORM III 7199

2/12/13
TC

FORM III
HPLC/IC MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-29976-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: 480-29976-2 MSD Client ID: OC-SB-504-7.5/9.5-XXX MSD

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONCENTRATION (mg/Kg)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Cr (VI)	20.9	15.5	74	1	20	55-110	

↓ 75% J/UJ all samples

Column to be used to flag recovery and RPD values

FORM III 7199

2/12/13
TC

FORM III
HPLC/IC MATRIX SPIKE INSOLUBLE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-29976-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: 480-29976-2 MSI Client ID: OC-SB-504-7.5/9.5-XXX MSI

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	MSI CONCENTRATION (mg/Kg)	MSI % REC	QC LIMITS REC	#
Cr (VI)	2430	ND	1730	71	55-110	

Column to be used to flag recovery and RPD values

FORM III 7199

2/12/13
TC

VOC's reported
2,4,4-TMP-1
244-TMP-2

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 #: 480-30106-1

LAB #: TAL-Buffalo

Sample IDs: Attach tracking sheet and/or sample listing.

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	
			Continuing Calibration	
☑	☐	☐	%D less than or equal to 25%	
☑	☐	☐	RRF greater than or equal to 0.05.	OK
			Blank Contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.
☐	☑	☐	Method blank contamination → Clean	
☐	☐	☑	Trip blank contamination not submitted	
☐	☐	☑	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%)	No MS/MSD analyzed w/ this data set
Field Duplicates ☐ ☐ ☑ RPD criteria (water <30%, soils <50%) met	No FD's in 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: 2/15/13

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.

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 #: 6107/30016-10 SDG #: 480-30106-1

LAB #: TAL Buffalo

Sample IDs: Attach tracking sheet and/or (sample listing.)

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%	OK Julie Ricardi Performed Tier 3 check of 12/18/12 I-Cal HP5973X in SDG 480-30406-1
☑	☐	☐	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 in method blanks and removed from samples See attached Form I's for MB's	
☐	☐	☐	Equipment/Rinseate blank contamination	
Surrogate Recoveries				

*

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)	
☑	☐	☐	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%)	See attached Form III
☑	☐	☐	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 RPD's out see form
			Field Duplicates	
☐	☐	☑	RPD criteria met (soils <50%, water <30%)	Not submitted in 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: 3/14/13

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: 480-30106-1

Client Sample ID: **OC-SB-514-0.0/1.0-XXX**

Lab Sample ID: 480-30106-4

Client Matrix: Solid

% Moisture: 22.8

Date Sampled: 12/12/2012 0850

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3205.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/20/2012 1633			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		330		87	220
N-Nitrosodi-n-propylamine		ND		13	43
4-Chlorophenyl phenyl ether		ND		13	43
4-Chloro-3-methylphenol		ND		13	86
Benzo[a]pyrene		ND		13	43
4-Methylphenol		ND		13	43
4-Nitroaniline		ND	UJ	36	220
2-Nitroaniline		ND		54	220
Caprolactam		ND		13	43
Carbazole		ND		13	43
4,6-Dinitro-2-methylphenol		ND		41	220
1-Methylnaphthalene		ND		13	43
N-Nitrosodiphenylamine		ND		13	43
Atrazine		ND		13	43
Phenyl ether		ND		13	43
Benzaldehyde		ND		13	43
Azobenzene		ND		13	43
Hexachlorocyclopentadiene		ND		13	86
3-Nitroaniline		ND		13	220
N-Nitrosodimethylamine		ND		13	43
Benzyl alcohol		ND		13	86
1,1'-Biphenyl		ND		13	43
2,3,4,6-Tetrachlorophenol		ND		13	43
Benzophenone		ND		13	43
Benzoic acid		ND		19	220
2,4,5-Trichlorophenol		ND		14	43
Aniline		ND		13	43
Hexachloroethane		ND		13	43
Dimethyl phthalate		ND		13	43
2,4-Dimethylphenol		ND		13	43
Isophorone		ND		13	43
Fluorene		ND		13	43
Dibenzofuran		ND		13	43
Acenaphthylene		ND		13	43
2,4-Dichlorophenol		ND		13	43
Benzo[g,h,i]perylene		ND		13	43
Hexachlorobenzene		ND		13	43
Di-n-octyl phthalate		ND		13	43
Hexachlorobutadiene		ND		13	43
Phenanthrene		ND		13	43
2-Nitrophenol		ND		17	43
Benzo[k]fluoranthene		ND		22	43
2,4-Dinitrophenol		ND	UJ	35	43
Anthracene		ND		13	43
2-Methylnaphthalene		ND		13	43
Di-n-butyl phthalate		ND		65	220

TC

3/4/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-514-0.0/1.0-XXX**

Lab Sample ID: 480-30106-4

Client Matrix: Solid

% Moisture: 22.8

Date Sampled: 12/12/2012 0850

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3205.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/20/2012 1633			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene	ND		13	43
Pyrene	20	J	13	43
2,4-Dinitrotoluene	ND		13	43
Dibenz(a,h)anthracene	ND		13	43
1,3-Dichlorobenzene	ND		13	43
Nitrobenzene	ND		13	43
Naphthalene	ND		13	43
2,4,6-Trichlorophenol	ND		18	43
Pentachlorophenol	ND		13	43
Fluoranthene	ND		13	43
3,3'-Dichlorobenzidine	ND		15	86
4-Bromophenyl phenyl ether	ND		13	43
Diethyl phthalate	ND		14	43
2-Methylphenol	ND		13	43
1,2-Dichlorobenzene	ND		13	43
2,2'-oxybis[1-chloropropane]	ND		13	43
Acetophenone	ND		13	43
Bis(2-chloroethyl)ether	ND		13	43
Benzo[a]anthracene	ND		13	43
1,2-Diphenylhydrazine	ND		13	43
Indeno[1,2,3-cd]pyrene	ND		13	43
Butyl benzyl phthalate	ND		13	43
Chrysene	ND		13	43
Acenaphthene	ND		13	43
Benzo[b]fluoranthene	ND		13	43
4-Nitrophenol	ND VJ	/	18	220
4-Chloroaniline	ND		39	86
2-Chlorophenol	ND		13	43
2,6-Dinitrotoluene	ND		36	43
Phenol	ND		13	43
3 & 4 Methylphenol	ND		13	43
1,4-Dichlorobenzene	ND		13	43
Bis(2-chloroethoxy)methane	ND		13	43
2-Chloronaphthalene	ND		13	43
1,2,4,5-Tetrachlorobenzene	ND		13	43

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	74		30 - 130
2-Fluorophenol	67		30 - 130
Nitrobenzene-d5	53		30 - 130
Phenol-d5	54		30 - 130
2-Fluorobiphenyl	89		30 - 130
p-Terphenyl-d14	73		30 - 130

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-514-0.0/1.0-XXX**

Lab Sample ID: 480-30106-4
Client Matrix: Solid
% Moisture: 22.8

Date Sampled: 12/12/2012 0850
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3205.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/20/2012 1633			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 10

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~3.85~~	~~64~~	~~T J~~
	~~Unknown~~	~~4.21~~	~~5300~~	~~T J~~
~~106-42-3~~	~~p-Xylene~~	~~4.65~~	~~2400~~	~~T J N~~
	~~Unknown~~	~~16.40~~	~~93~~	~~T J~~
~~1000163-4-7~~	~~Docosa-2,6,10,14,18-pentaen-22-al, 2,6,1~~	~~16.47~~	~~160~~	~~T J N~~
	Unknown	16.68	260	~~T~~ J N
	Unknown	17.09	50	~~T~~ J N
630-3-5	Nonacosane	17.28	86	~~T~~ J N
	Unknown	17.51	110	~~T~~ J N
	Unknown	17.81	270	~~T~~ J N

3/19/13
TC

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-514-7.0/9.0-XXX**

Lab Sample ID: 480-30106-5

Client Matrix: Solid

% Moisture: 21.6

Date Sampled: 12/12/2012 0900

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3174.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 1921			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		85	210
2,4,5-Trichlorophenol		ND		14	42
Aniline		ND		13	42
Hexachloroethane		ND		13	42
Dimethyl phthalate		ND		13	42
2,4-Dimethylphenol		ND UJ		13	42
Isophorone		ND		13	42
Fluorene		ND		13	42
Dibenzofuran		ND		13	42
Acenaphthylene		ND		13	42
2,4-Dichlorophenol		ND		13	42
Benzo[g,h,i]perylene		ND		13	42
Hexachlorobenzene		ND		13	42
Di-n-octyl phthalate		ND		13	42
Hexachlorobutadiene		ND		13	42
Phenanthrene		ND		13	42
2-Nitrophenol		ND UJ		16	42
Benzo[k]fluoranthene		ND		22	42
2,4-Dinitrophenol		~~ND~~ R		34	42
Anthracene		ND		13	42
2-Methylnaphthalene		ND		13	42
Di-n-butyl phthalate		ND		63	210
1,2,4-Trichlorobenzene		ND		13	42
Pyrene		ND		13	42
2,4-Dinitrotoluene		ND		13	42
Dibenz(a,h)anthracene		ND		13	42
1,3-Dichlorobenzene		ND		13	42
Nitrobenzene		ND		13	42
Naphthalene		ND		13	42
2,4,6-Trichlorophenol		ND		18	42
Pentachlorophenol		ND		13	42
Fluoranthene		ND		13	42
3,3'-Dichlorobenzidine		ND		15	84
4-Bromophenyl phenyl ether		ND		13	42
Diethyl phthalate		ND		14	42
2-Methylphenol		ND		13	42
1,2-Dichlorobenzene		ND		13	42
2,2'-oxybis[1-chloropropane]		ND		13	42
Acetophenone		ND		13	42
Bis(2-chloroethyl)ether		ND		13	42
Benzo[a]anthracene		ND		13	42
Indeno[1,2,3-cd]pyrene		ND		13	42
Butyl benzyl phthalate		ND		13	42
Chrysene		ND		13	42
Acenaphthene		ND		13	42
Benzo[b]fluoranthene		ND		13	42

TC 3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-514-7.0/9.0-XXX**

Lab Sample ID: 480-30106-5
Client Matrix: Solid
% Moisture: 21.6

Date Sampled: 12/12/2012 0900
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3174.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 1921			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND ~~UJ~~ R		18	210
4-Chloroaniline		ND UJ		38	84
2-Chlorophenol		ND		13	42
2,6-Dinitrotoluene		ND UJ		35	42
Phenol		ND		13	42
3 & 4 Methylphenol		ND		13	42
1,4-Dichlorobenzene		ND		13	42
Bis(2-chloroethoxy)methane		ND		13	42
2-Chloronaphthalene		ND		13	42
N-Nitrosodi-n-propylamine		ND		13	42
4-Chlorophenyl phenyl ether		ND		13	42
4-Chloro-3-methylphenol		ND		13	84
Benzo[a]pyrene		ND		13	42
4-Methylphenol		ND UJ		13	42
4-Nitroaniline		ND		35	210
2-Nitroaniline		ND		53	210
Caprolactam		ND		13	42
Carbazole		ND		13	42
4,6-Dinitro-2-methylphenol		ND		41	210
1-Methylnaphthalene		ND		13	42
N-Nitrosodiphenylamine		ND		13	42
Atrazine		ND		13	42
Phenyl ether		ND		13	42
Benzaldehyde		ND		13	42
Azobenzene		ND		13	42
Hexachlorocyclopentadiene		ND		13	84
3-Nitroaniline		ND		13	210
N-Nitrosodimethylamine		ND UJ		13	42
Benzyl alcohol		~~ND~~ R		13	84
1,1'-Biphenyl		ND		13	42
2,3,4,6-Tetrachlorophenol		ND		13	42
Benzophenone		ND		13	42
Benzoic acid		ND UJ		19	210
1,2,4,5-Tetrachlorobenzene		ND		13	42

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	85		30 - 130
2-Fluorophenol	71		30 - 130
Nitrobenzene-d5	49		30 - 130
Phenol-d5	52		30 - 130
2-Fluorobiphenyl	76		30 - 130
p-Terphenyl-d14	98		30 - 130

TC

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-514-7.0/9.0-XXX**

Lab Sample ID: 480-30106-5

Client Matrix: Solid

% Moisture: 21.6

Date Sampled: 12/12/2012 0900

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3174.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 1921			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.87	43	~~T~~ J N
	~~Unknown~~	~~4.23~~	~~4400~~	~~T J~~
~~108-38-3~~	~~Benzene, 1,3-dimethyl-~~	~~4.67~~	~~41~~	~~T J N~~
124-18-5	Decane	6.35	25	~~T~~ J N
629-99-2	Pentacosane	15.59	32	~~T~~ J N
1928-30-9	Tricosane, 2-methyl-	15.87	35	~~T~~ J N
638-67-5	Tricosane	16.13	29	~~T~~ J N
112-95-8	Eicosane	16.40	32	~~T~~ J N
	Unknown	16.68	42	~~T~~ J N
	Unknown	16.98	32	~~T~~ J N

TC 3/19/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-514-15/17-XXX**

Lab Sample ID: 480-30106-6

Client Matrix: Solid

% Moisture: 8.0

Date Sampled: 12/12/2012 0920

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3175.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/19/2012 1947			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		73	180
2,4,5-Trichlorophenol		ND		12	36
Aniline		ND		11	36
Hexachloroethane		ND		11	36
Dimethyl phthalate		ND		11	36
2,4-Dimethylphenol		ND VJ	✓	11	36
Isophorone		ND		11	36
Fluorene		ND		11	36
Dibenzofuran		ND		11	36
Acenaphthylene		ND		11	36
2,4-Dichlorophenol		ND		11	36
Benzo[g,h,i]perylene		ND		11	36
Hexachlorobenzene		ND		11	36
Di-n-octyl phthalate		ND		11	36
Hexachlorobutadiene		ND		11	36
Phenanthrene		ND		11	36
2-Nitrophenol		ND VJ	✓	14	36
Benzo[k]fluoranthene		ND		18	36
2,4-Dinitrophenol		~~ND~~ R	✓	29	36
Anthracene		ND		11	36
2-Methylnaphthalene		ND		11	36
Di-n-butyl phthalate		ND		54	180
1,2,4-Trichlorobenzene		ND		11	36
Pyrene		ND		11	36
2,4-Dinitrotoluene		ND		11	36
Dibenz(a,h)anthracene		ND		11	36
1,3-Dichlorobenzene		ND		11	36
Nitrobenzene		ND		11	36
Naphthalene		ND		11	36
2,4,6-Trichlorophenol		ND		15	36
Pentachlorophenol		ND		11	36
Fluoranthene		ND		11	36
3,3'-Dichlorobenzidine		ND		13	72
4-Bromophenyl phenyl ether		ND		11	36
Diethyl phthalate		ND		12	36
2-Methylphenol		ND		11	36
1,2-Dichlorobenzene		ND		11	36
2,2'-oxybis[1-chloropropane]		ND		11	36
Acetophenone		ND		11	36
Bis(2-chloroethyl)ether		ND		11	36
Benzo[a]anthracene		ND		11	36
Indeno[1,2,3-cd]pyrene		ND		11	36
Butyl benzyl phthalate		ND		11	36
Chrysene		ND		11	36
Acenaphthene		ND		11	36
Benzo[b]fluoranthene		ND		11	36

TC 3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-514-15/17-XXX**

Lab Sample ID: 480-30106-6

Client Matrix: Solid

% Moisture: 8.0

Date Sampled: 12/12/2012 0920

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3175.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/19/2012 1947			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		~~ND~~ R		15	180
4-Chloroaniline		ND UJ		32	72
2-Chlorophenol		ND		11	36
2,6-Dinitrotoluene		ND UJ		30	36
Phenol		ND		11	36
3 & 4 Methylphenol		ND		11	36
1,4-Dichlorobenzene		ND		11	36
Bis(2-chloroethoxy)methane		ND		11	36
2-Chloronaphthalene		ND		11	36
N-Nitrosodi-n-propylamine		ND		11	36
4-Chlorophenyl phenyl ether		ND		11	36
4-Chloro-3-methylphenol		ND UJ		11	72
Benzo[a]pyrene		ND		11	36
4-Methylphenol		ND UJ		11	36
4-Nitroaniline		ND		30	180
2-Nitroaniline		ND		45	180
Caprolactam		ND		11	36
Carbazole		ND		11	36
4,6-Dinitro-2-methylphenol		ND		35	180
1-Methylnaphthalene		ND		11	36
N-Nitrosodiphenylamine		ND UJ		11	36
Atrazine		ND		11	36
Phenyl ether		ND		11	36
Benzaldehyde		ND		11	36
Azobenzene		ND		11	36
Hexachlorocyclopentadiene		ND		11	72
3-Nitroaniline		ND		11	180
N-Nitrosodimethylamine		ND UJ		11	36
Benzyl alcohol		~~ND~~ R		11	72
1,1'-Biphenyl		ND		11	36
2,3,4,6-Tetrachlorophenol		ND		11	36
Benzophenone		ND		11	36
Benzoic acid		ND UJ		16	180
1,2,4,5-Tetrachlorobenzene		ND		11	36

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	81		30 - 130
2-Fluorophenol	70		30 - 130
Nitrobenzene-d5	78		30 - 130
Phenol-d5	67		30 - 130
2-Fluorobiphenyl	77		30 - 130
p-Terphenyl-d14	102		30 - 130

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-514-15/17-XXX**

Lab Sample ID: 480-30106-6

Client Matrix: Solid

% Moisture: 8.0

Date Sampled: 12/12/2012 0920

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3175.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/19/2012 1947			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 8

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.03	27	T J
	~~Unknown~~	~~3.86~~	~~43~~	~~T J~~
	~~Unknown~~	~~4.22~~	~~4300~~	~~T J~~
	~~Unknown~~	~~4.24~~	~~25~~	~~T J~~
~~108-38-3~~	~~Benzene, 1,3-dimethyl-~~	~~4.66~~	~~43~~	~~T J N~~
	Unknown	6.34	24	T J
	Unknown	14.14	35	T J
	Unknown	16.02	65	T J

TC
3/19/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-515-6.0/8.0-XXX**

Lab Sample ID: 480-30106-8

Client Matrix: Solid

% Moisture: 15.4

Date Sampled: 12/12/2012 1020

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3176.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 2012			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		79	200
2,4,5-Trichlorophenol		ND		13	39
Aniline		ND		12	39
Hexachloroethane		ND		12	39
Dimethyl phthalate		ND		12	39
2,4-Dimethylphenol		ND UJ		12	39
Isophorone		ND		12	39
Fluorene		ND		12	39
Dibenzofuran		ND		12	39
Acenaphthylene		ND		12	39
2,4-Dichlorophenol		ND		12	39
Benzo[g,h,i]perylene		ND		12	39
Hexachlorobenzene		ND		12	39
Di-n-octyl phthalate		ND		12	39
Hexachlorobutadiene		ND		12	39
Phenanthrene		ND		12	39
2-Nitrophenol		ND		15	39
Benzo[k]fluoranthene		ND		20	39
2,4-Dinitrophenol		~~ND~~ R		32	39
Anthracene		ND		12	39
2-Methylnaphthalene		ND		12	39
Di-n-butyl phthalate		ND		59	200
1,2,4-Trichlorobenzene		ND		12	39
Pyrene		ND		12	39
2,4-Dinitrotoluene		ND		12	39
Dibenz(a,h)anthracene		ND		12	39
1,3-Dichlorobenzene		ND		12	39
Nitrobenzene		ND		12	39
Naphthalene		ND		12	39
2,4,6-Trichlorophenol		ND		16	39
Pentachlorophenol		ND		12	39
Fluoranthene		ND		12	39
3,3'-Dichlorobenzidine		ND		14	78
4-Bromophenyl phenyl ether		ND		12	39
Diethyl phthalate		ND		13	39
2-Methylphenol		ND		12	39
1,2-Dichlorobenzene		ND		12	39
2,2'-oxybis[1-chloropropane]		ND		12	39
Acetophenone		ND		12	39
Bis(2-chloroethyl)ether		ND		12	39
Benzo[a]anthracene		ND		12	39
Indeno[1,2,3-cd]pyrene		ND		12	39
Butyl benzyl phthalate		ND		12	39
Chrysene		ND		12	39
Acenaphthene		ND		12	39
Benzo[b]fluoranthene		ND		12	39

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-515-6.0/8.0-XXX**

Lab Sample ID: 480-30106-8

Client Matrix: Solid

% Moisture: 15.4

Date Sampled: 12/12/2012 1020

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3176.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 2012			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		~~ND UJ~~ R		16	200
4-Chloroaniline		ND UJ		35	78
2-Chlorophenol		ND		12	39
2,6-Dinitrotoluene		ND UJ		33	39
Phenol		ND		12	39
3 & 4 Methylphenol		ND		12	39
1,4-Dichlorobenzene		ND		12	39
Bis(2-chloroethoxy)methane		ND		12	39
2-Chloronaphthalene		ND		12	39
N-Nitrosodi-n-propylamine		ND		12	39
4-Chlorophenyl phenyl ether		ND		12	39
4-Chloro-3-methylphenol		ND		12	78
Benzo[a]pyrene		ND		12	39
4-Methylphenol		ND UJ		12	39
4-Nitroaniline		ND		33	200
2-Nitroaniline		ND		49	200
Caprolactam		ND		12	39
Carbazole		ND		12	39
4,6-Dinitro-2-methylphenol		ND		38	200
1-Methylnaphthalene		ND		12	39
N-Nitrosodiphenylamine		ND		12	39
Atrazine		ND		12	39
Phenyl ether		ND		12	39
Benzaldehyde		ND		12	39
Azobenzene		ND		12	39
Hexachlorocyclopentadiene		ND		12	78
3-Nitroaniline		ND		12	200
N-Nitrosodimethylamine		ND UJ		12	39
Benzyl alcohol		~~ND~~ R		12	78
1,1'-Biphenyl		ND		12	39
2,3,4,6-Tetrachlorophenol		ND		12	39
Benzophenone		ND		12	39
Benzoic acid		ND UJ		18	200
1,2,4,5-Tetrachlorobenzene		ND		12	39

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	66		30 - 130
2-Fluorophenol	74		30 - 130
Nitrobenzene-d5	68		30 - 130
Phenol-d5	55		30 - 130
2-Fluorobiphenyl	84		30 - 130
p-Terphenyl-d14	94		30 - 130

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-515-6.0/8.0-XXX**

Lab Sample ID: 480-30106-8

Client Matrix: Solid

% Moisture: 15.4

Date Sampled: 12/12/2012 1020

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3176.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 2012			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 8

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~3.85~~	~~48~~	~~T J~~
	~~Unknown~~	~~4.21~~	~~4300~~	~~T J~~
~~108-38-3~~	~~Benzene, 1,3-dimethyl-~~	~~4.66~~	~~55~~	~~T J N~~
	Unknown	6.34	27	T J N
	Unknown	7.48	25	T J N
	Unknown	15.87	25	T J N
	Unknown	16.13	22	T J N
	Unknown	16.40	21	T J N

TC
3/19/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-515-13/15-XXX**

Lab Sample ID: 480-30106-9

Client Matrix: Solid

% Moisture: 16.8

Date Sampled: 12/12/2012 1045

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3192.D
Dilution:	1.0			Initial Weight/Volume:	000030.9 g
Analysis Date:	12/20/2012 1101			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		78	190
2,4,5-Trichlorophenol		ND		13	39
Aniline		ND		12	39
Hexachloroethane		ND		12	39
Dimethyl phthalate		ND		12	39
2,4-Dimethylphenol		ND		12	39
Isophorone		ND		12	39
Fluorene		ND		12	39
Dibenzofuran		ND		12	39
Acenaphthylene		ND		12	39
2,4-Dichlorophenol		ND		12	39
Benzo[g,h,i]perylene		ND		12	39
Hexachlorobenzene		ND		12	39
Di-n-octyl phthalate		ND		12	39
Hexachlorobutadiene		ND		12	39
Phenanthrene		ND		12	39
2-Nitrophenol		ND		15	39
Benzo[k]fluoranthene		ND		20	39
2,4-Dinitrophenol		ND UJ		32	39
Anthracene		ND		12	39
2-Methylnaphthalene		ND		12	39
Di-n-butyl phthalate		ND		58	190
1,2,4-Trichlorobenzene		ND		12	39
Pyrene		ND		12	39
2,4-Dinitrotoluene		ND		12	39
Dibenz(a,h)anthracene		ND		12	39
1,3-Dichlorobenzene		ND		12	39
Nitrobenzene		ND		12	39
Naphthalene		ND		12	39
2,4,6-Trichlorophenol		ND		16	39
Pentachlorophenol		ND		12	39
Fluoranthene		ND		12	39
3,3'-Dichlorobenzidine		ND		14	78
4-Bromophenyl phenyl ether		ND		12	39
Diethyl phthalate		ND		13	39
2-Methylphenol		ND		12	39
1,2-Dichlorobenzene		ND		12	39
2,2'-oxybis[1-chloropropane]		ND		12	39
Acetophenone		ND		12	39
Bis(2-chloroethyl)ether		ND		12	39
Benzo[a]anthracene		ND		12	39
Indeno[1,2,3-cd]pyrene		ND		12	39
Butyl benzyl phthalate		ND		12	39
Chrysene		ND		12	39
Acenaphthene		ND		12	39
Benzo[b]fluoranthene		ND		12	39

TC 3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-515-13/15-XXX**

Lab Sample ID: 480-30106-9

Client Matrix: Solid

% Moisture: 16.8

Date Sampled: 12/12/2012 1045

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3192.D
Dilution:	1.0			Initial Weight/Volume:	000030.9 g
Analysis Date:	12/20/2012 1101			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND UJ		16	190
4-Chloroaniline		ND		35	78
2-Chlorophenol		ND		12	39
2,6-Dinitrotoluene		ND		33	39
Phenol		ND		12	39
3 & 4 Methylphenol		ND		12	39
1,4-Dichlorobenzene		ND		12	39
Bis(2-chloroethoxy)methane		ND		12	39
2-Chloronaphthalene		ND		12	39
N-Nitrosodi-n-propylamine		ND		12	39
4-Chlorophenyl phenyl ether		ND		12	39
4-Chloro-3-methylphenol		ND		12	78
Benzo[a]pyrene		ND		12	39
4-Methylphenol		ND		12	39
4-Nitroaniline		ND UJ		33	190
2-Nitroaniline		ND		49	190
Caprolactam		ND		12	39
Carbazole		ND		12	39
4,6-Dinitro-2-methylphenol		ND		37	190
1-Methylnaphthalene		ND		12	39
N-Nitrosodiphenylamine		ND		12	39
Atrazine		ND		12	39
Phenyl ether		ND		12	39
Benzaldehyde		ND		12	39
Azobenzene		ND		12	39
Hexachlorocyclopentadiene		ND		12	78
3-Nitroaniline		ND		12	190
N-Nitrosodimethylamine		ND		12	39
Benzyl alcohol		ND		12	78
1,1'-Biphenyl		ND		12	39
2,3,4,6-Tetrachlorophenol		ND		12	39
Benzophenone		ND		12	39
Benzoic acid		ND		18	190
1,2,4,5-Tetrachlorobenzene		ND		12	39

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	87		30 - 130
2-Fluorophenol	88		30 - 130
Nitrobenzene-d5	68		30 - 130
Phenol-d5	83		30 - 130
2-Fluorobiphenyl	81		30 - 130
p-Terphenyl-d14	117		30 - 130

TC 3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-515-13/15-XXX**

Lab Sample ID: 480-30106-9

Client Matrix: Solid

% Moisture: 16.8

Date Sampled: 12/12/2012 1045

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3192.D
Dilution:	1.0			Initial Weight/Volume:	000030.9 g
Analysis Date:	12/20/2012 1101			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.91	52	~~T~~ J N
	~~Unknown~~	~~4.25~~	~~4800~~	~~T J~~
	~~Unknown~~	~~4.27~~	~~71~~	~~T J~~
~~106-42-3~~	~~p-Xylene~~	~~4.68~~	~~64~~	~~T J N~~
	Unknown	7.48	39	~~T~~ J N
629-99-2	Pentacosane	15.58	37	~~T~~ J N
630-1-3	Hexacosane	15.86	38	~~T~~ J N
544-85-4	Dotriacontane	16.12	40	~~T~~ J N
630-2-4	Octacosane	16.39	50	~~T~~ J N
	Unknown	16.67	38	~~T~~ J N

TC
3/19/12

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-516-6.0/8.0-XXX**

Lab Sample ID: 480-30106-11
Client Matrix: Solid
% Moisture: 16.7

Date Sampled: 12/12/2012 1125
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3178.D
Dilution:	1.0			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/19/2012 2103			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		80	200
2,4,5-Trichlorophenol		ND		13	40
Aniline		ND		12	40
Hexachloroethane		ND		12	40
Dimethyl phthalate		ND		12	40
2,4-Dimethylphenol		ND UJ		12	40
Isophorone		ND		12	40
Fluorene		ND		12	40
Dibenzofuran		ND		12	40
Acenaphthylene		ND		12	40
2,4-Dichlorophenol		ND		12	40
Benzo[g,h,i]perylene		ND		12	40
Hexachlorobenzene		ND		12	40
Di-n-octyl phthalate		ND		12	40
Hexachlorobutadiene		ND		12	40
Phenanthrene		ND		12	40
2-Nitrophenol		ND UJ		15	40
Benzo[k]fluoranthene		ND		20	40
2,4-Dinitrophenol		~~ND~~ R		32	40
Anthracene		ND		12	40
2-Methylnaphthalene		ND		12	40
Di-n-butyl phthalate		ND		59	200
1,2,4-Trichlorobenzene		ND		12	40
Pyrene		ND		12	40
2,4-Dinitrotoluene		ND		12	40
Dibenz(a,h)anthracene		ND		12	40
1,3-Dichlorobenzene		ND		12	40
Nitrobenzene		ND		12	40
Naphthalene		ND		12	40
2,4,6-Trichlorophenol		ND		17	40
Pentachlorophenol		ND		12	40
Fluoranthene		ND		12	40
3,3'-Dichlorobenzidine		ND		14	79
4-Bromophenyl phenyl ether		ND		12	40
Diethyl phthalate		ND		13	40
2-Methylphenol		ND		12	40
1,2-Dichlorobenzene		ND		12	40
2,2'-oxybis[1-chloropropane]		ND		12	40
Acetophenone		ND		12	40
Bis(2-chloroethyl)ether		ND		12	40
Benzo[a]anthracene		ND		12	40
Indeno[1,2,3-cd]pyrene		ND		12	40
Butyl benzyl phthalate		ND		12	40
Chrysene		ND		12	40
Acenaphthene		ND		12	40
Benzo[b]fluoranthene		ND		12	40

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-516-6.0/8.0-XXX**

Lab Sample ID: 480-30106-11

Client Matrix: Solid

% Moisture: 16.7

Date Sampled: 12/12/2012 1125

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3178.D
Dilution:	1.0			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/19/2012 2103			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		~~ND~~ R		17	200
4-Chloroaniline		ND UJ		36	79
2-Chlorophenol		ND		12	40
2,6-Dinitrotoluene		ND UJ		33	40
Phenol		ND		12	40
3 & 4 Methylphenol		ND		12	40
1,4-Dichlorobenzene		ND		12	40
Bis(2-chloroethoxy)methane		ND		12	40
2-Chloronaphthalene		ND		12	40
N-Nitrosodi-n-propylamine		ND		12	40
4-Chlorophenyl phenyl ether		ND		12	40
4-Chloro-3-methylphenol		ND		12	79
Benzo[a]pyrene		ND		12	40
4-Methylphenol		ND UJ		12	40
4-Nitroaniline		ND		33	200
2-Nitroaniline		ND		50	200
Caprolactam		ND		12	40
Carbazole		ND		12	40
4,6-Dinitro-2-methylphenol		ND		38	200
1-Methylnaphthalene		ND		12	40
N-Nitrosodiphenylamine		ND		12	40
Atrazine		ND		12	40
Phenyl ether		ND		12	40
Benzaldehyde		ND		12	40
Azobenzene		ND		12	40
Hexachlorocyclopentadiene		ND		12	79
3-Nitroaniline		ND		12	200
N-Nitrosodimethylamine		ND UJ		12	40
Benzyl alcohol		~~ND~~ R		12	79
1,1'-Biphenyl		ND		12	40
2,3,4,6-Tetrachlorophenol		ND		12	40
Benzophenone		ND		12	40
Benzoic acid		ND UJ		18	200
1,2,4,5-Tetrachlorobenzene		ND		12	40

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	73		30 - 130
2-Fluorophenol	71		30 - 130
Nitrobenzene-d5	66		30 - 130
Phenol-d5	55		30 - 130
2-Fluorobiphenyl	81		30 - 130
p-Terphenyl-d14	96		30 - 130

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-516-6.0/8.0-XXX**

Lab Sample ID: 480-30106-11

Client Matrix: Solid

% Moisture: 16.7

Date Sampled: 12/12/2012 1125

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3178.D
Dilution:	1.0			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/19/2012 2103			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 6

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~3.86~~	~~34~~	~~T J~~
	~~Unknown~~	~~4.21~~	~~4300~~	~~T J~~
	~~Unknown~~	~~4.23~~	~~28~~	~~T J~~
~~95-47-6~~	~~Benzene, 1,2-dimethyl-~~	~~4.66~~	~~48~~	~~T J N~~
	Unknown	6.35	27	~~T~~ J N
	Unknown	7.49	25	~~T~~ J N

TC
3/19/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-516-15/17-XXX**

Lab Sample ID: 480-30106-12

Client Matrix: Solid

% Moisture: 21.6

Date Sampled: 12/12/2012 1140

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3179.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/19/2012 2128			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		85	210
2,4,5-Trichlorophenol		ND		14	42
Aniline		ND		13	42
Hexachloroethane		ND		13	42
Dimethyl phthalate		ND		13	42
2,4-Dimethylphenol		ND VJ	*	13	42
Isophorone		ND		13	42
Fluorene		ND		13	42
Dibenzofuran		ND		13	42
Acenaphthylene		ND		13	42
2,4-Dichlorophenol		ND		13	42
Benzo[g,h,i]perylene		ND		13	42
Hexachlorobenzene		ND		13	42
Di-n-octyl phthalate		ND		13	42
Hexachlorobutadiene		ND		13	42
Phenanthrene		ND		13	42
2-Nitrophenol		ND VJ	*	17	42
Benzo[k]fluoranthene		ND		22	42
2,4-Dinitrophenol		~~ND~~ R	*	34	42
Anthracene		ND		13	42
2-Methylnaphthalene		ND		13	42
Di-n-butyl phthalate		ND		64	210
1,2,4-Trichlorobenzene		ND		13	42
Pyrene		ND		13	42
2,4-Dinitrotoluene		ND		13	42
Dibenz(a,h)anthracene		ND		13	42
1,3-Dichlorobenzene		ND		13	42
Nitrobenzene		ND		13	42
Naphthalene		ND		13	42
2,4,6-Trichlorophenol		ND		18	42
Pentachlorophenol		ND		13	42
Fluoranthene		ND		13	42
3,3'-Dichlorobenzidine		ND		15	85
4-Bromophenyl phenyl ether		ND		13	42
Diethyl phthalate		ND		14	42
2-Methylphenol		ND		13	42
1,2-Dichlorobenzene		ND		13	42
2,2'-oxybis[1-chloropropane]		ND		13	42
Acetophenone		ND		13	42
Bis(2-chloroethyl)ether		ND		13	42
Benzo[a]anthracene		ND		13	42
Indeno[1,2,3-cd]pyrene		ND		13	42
Butyl benzyl phthalate		ND		13	42
Chrysene		ND		13	42
Acenaphthene		ND		13	42
Benzo[b]fluoranthene		ND		13	42

3/21/13
JC

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-516-15/17-XXX**

Lab Sample ID: 480-30106-12
Client Matrix: Solid
% Moisture: 21.6

Date Sampled: 12/12/2012 1140
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3179.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/19/2012 2128			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND R		18	210
4-Chloroaniline		ND UJ		38	85
2-Chlorophenol		ND		13	42
2,6-Dinitrotoluene		ND UJ		36	42
Phenol		ND		13	42
3 & 4 Methylphenol		ND		13	42
1,4-Dichlorobenzene		ND		13	42
Bis(2-chloroethoxy)methane		ND		13	42
2-Chloronaphthalene		ND		13	42
N-Nitrosodi-n-propylamine		ND		13	42
4-Chlorophenyl phenyl ether		17	J	13	42
4-Chloro-3-methylphenol		ND		13	85
Benzo[a]pyrene		ND		13	42
4-Methylphenol		ND UJ		13	42
4-Nitroaniline		ND		36	210
2-Nitroaniline		ND		53	210
Caprolactam		ND		13	42
Carbazole		ND		13	42
4,6-Dinitro-2-methylphenol		ND		41	210
1-Methylnaphthalene		ND		13	42
N-Nitrosodiphenylamine		ND		13	42
Atrazine		ND		13	42
Phenyl ether		43		13	42
Benzaldehyde		ND		13	42
Azobenzene		ND		13	42
Hexachlorocyclopentadiene		ND		13	85
3-Nitroaniline		ND		13	210
N-Nitrosodimethylamine		ND UJ		13	42
Benzyl alcohol		ND R		13	85
1,1'-Biphenyl		ND		13	42
2,3,4,6-Tetrachlorophenol		ND		13	42
Benzophenone		ND		13	42
Benzoic acid		ND UJ		19	210
1,2,4,5-Tetrachlorobenzene		ND		13	42

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	66		30 - 130
2-Fluorophenol	55		30 - 130
Nitrobenzene-d5	60		30 - 130
Phenol-d5	62		30 - 130
2-Fluorobiphenyl	68		30 - 130
p-Terphenyl-d14	91		30 - 130

3/21/13
TC

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-516-15/17-XXX**

Lab Sample ID: 480-30106-12
Client Matrix: Solid
% Moisture: 21.6

Date Sampled: 12/12/2012 1140
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3179.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/19/2012 2128			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 4

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~3.85~~	~~43~~	~~T J~~
	~~Unknown~~	~~4.21~~	~~4400~~	~~T J~~
~~106-42-3~~	~~p-Xylene~~	~~4.65~~	~~39~~	~~T J N~~
	Unknown	6.34	28	~~T~~ J N

TC
3/19/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-0.0/1.0-XXX**

Lab Sample ID: 480-30106-13

Client Matrix: Solid

% Moisture: 9.0

Date Sampled: 12/12/2012 1215

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3180.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/19/2012 2154			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
~~Bis(2-ethylhexyl) phthalate~~		~~2900~~	~~E~~	~~73~~	~~180~~
2,4,5-Trichlorophenol		ND		12	36
Aniline		ND		11	36
Hexachloroethane		ND		11	36
Dimethyl phthalate		ND		11	36
2,4-Dimethylphenol		ND UJ	✓	11	36
Isophorone		ND		11	36
Fluorene		ND		11	36
Dibenzofuran		ND		11	36
Acenaphthylene		ND		11	36
2,4-Dichlorophenol		ND		11	36
Benzo[g,h,i]perylene		ND		11	36
Hexachlorobenzene		ND		11	36
Di-n-octyl phthalate		ND		11	36
Hexachlorobutadiene		ND		11	36
Phenanthrene		ND		11	36
2-Nitrophenol		ND UJ	✓	14	36
Benzo[k]fluoranthene		ND		18	36
2,4-Dinitrophenol		~~ND~~ R	✓	29	36
Anthracene		ND		11	36
2-Methylnaphthalene		ND		11	36
Di-n-butyl phthalate		ND		54	180
1,2,4-Trichlorobenzene		ND		11	36
Pyrene		ND		11	36
2,4-Dinitrotoluene		ND		11	36
Dibenz(a,h)anthracene		ND		11	36
1,3-Dichlorobenzene		ND		11	36
Nitrobenzene		ND		11	36
Naphthalene		ND		11	36
2,4,6-Trichlorophenol		ND		15	36
Pentachlorophenol		ND		11	36
Fluoranthene		ND		11	36
3,3'-Dichlorobenzidine		ND		13	72
4-Bromophenyl phenyl ether		ND		11	36
Diethyl phthalate		ND		12	36
2-Methylphenol		ND		11	36
1,2-Dichlorobenzene		ND		11	36
2,2'-oxybis[1-chloropropane]		ND		11	36
Acetophenone		ND		11	36
Bis(2-chloroethyl)ether		ND		11	36
Benzo[a]anthracene		ND		11	36
Indeno[1,2,3-cd]pyrene		ND		11	36
Butyl benzyl phthalate		ND		11	36
Chrysene		ND		11	36
Acenaphthene		ND		11	36
Benzo[b]fluoranthene		ND		11	36

3/21/13
TC

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-0.0/1.0-XXX**

Lab Sample ID: 480-30106-13

Client Matrix: Solid

% Moisture: 9.0

Date Sampled: 12/12/2012 1215

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3180.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/19/2012 2154			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND ~~R~~	*	15	180
4-Chloroaniline		ND UJ	*	33	72
2-Chlorophenol		ND		11	36
2,6-Dinitrotoluene		ND UJ	*	30	36
Phenol		ND		11	36
3 & 4 Methylphenol		ND		11	36
1,4-Dichlorobenzene		ND		11	36
Bis(2-chloroethoxy)methane		ND		11	36
2-Chloronaphthalene		ND		11	36
N-Nitrosodi-n-propylamine		ND		11	36
4-Chlorophenyl phenyl ether		ND		11	36
4-Chloro-3-methylphenol		ND		11	72
Benzo[a]pyrene		ND		11	36
4-Methylphenol		ND UJ		11	36
4-Nitroaniline		ND		30	180
2-Nitroaniline		ND		46	180
Caprolactam		ND		11	36
Carbazole		ND		11	36
4,6-Dinitro-2-methylphenol		ND		35	180
1-Methylnaphthalene		ND		11	36
N-Nitrosodiphenylamine		ND		11	36
Atrazine		ND		11	36
Phenyl ether		ND		11	36
Benzaldehyde		ND		11	36
Azobenzene		ND		11	36
Hexachlorocyclopentadiene		ND		11	72
3-Nitroaniline		ND		11	180
N-Nitrosodimethylamine		ND UJ		11	36
Benzyl alcohol		~~ND~~ R		11	72
1,1'-Biphenyl		ND		11	36
2,3,4,6-Tetrachlorophenol		ND		11	36
Benzophenone		ND		11	36
Benzoic acid		ND UJ		16	180
1,2,4,5-Tetrachlorobenzene		ND		11	36

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	59		30 - 130
2-Fluorophenol	60		30 - 130
Nitrobenzene-d5	65		30 - 130
Phenol-d5	62		30 - 130
2-Fluorobiphenyl	78		30 - 130
p-Terphenyl-d14	61		30 - 130

3/21/13
TC

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-0.0/1.0-XXX**

Lab Sample ID: 480-30106-13
Client Matrix: Solid
% Moisture: 9.0

Date Sampled: 12/12/2012 1215
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3180.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/19/2012 2154			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 3

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	4.19	3000	T J
149-57-5	Hexanoic acid, 2-ethyl-	7.67	230	T J N
	Unknown	9.60	280	T J

TC
3/19/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-0.0/1.0-XXX**

Lab Sample ID: 480-30106-13
Client Matrix: Solid
% Moisture: 9.0

Date Sampled: 12/12/2012 1215
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3201.D
Dilution:	20			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1451	Run Type:	DL	Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		12000		1500	3600
2,4,5-Trichlorophenol		ND		240	720
Aniline		ND		220	720
Hexachloroethane		ND		220	720
Dimethyl phthalate		ND		220	720
2,4-Dimethylphenol		ND	*	220	720
Isophorone		ND		220	720
Fluorene		ND		220	720
Dibenzofuran		ND		220	720
Acenaphthylene		ND		220	720
2,4-Dichlorophenol		ND		220	720
Benzo[g,h,i]perylene		ND		220	720
Hexachlorobenzene		ND		220	720
Di-n-octyl phthalate		ND		220	720
Hexachlorobutadiene		ND		220	720
Phenanthrene		ND		220	720
2-Nitrophenol		ND	*	280	720
Benzo[k]fluoranthene		ND		370	720
2,4-Dinitrophenol		ND	*	590	720
Anthracene		ND		220	720
2-Methylnaphthalene		ND		220	720
Di-n-butyl phthalate		ND		1100	3600
1,2,4-Trichlorobenzene		ND		220	720
Pyrene		ND		220	720
2,4-Dinitrotoluene		ND		220	720
Dibenz(a,h)anthracene		ND		220	720
1,3-Dichlorobenzene		ND		220	720
Nitrobenzene		ND		220	720
Naphthalene		ND		220	720
2,4,6-Trichlorophenol		ND		300	720
Pentachlorophenol		ND		220	720
Fluoranthene		ND		220	720
3,3'-Dichlorobenzidine		ND		260	1400
4-Bromophenyl phenyl ether		ND		220	720
Diethyl phthalate		ND		240	720
2-Methylphenol		ND		220	720
1,2-Dichlorobenzene		ND		220	720
2,2'-oxybis[1-chloropropane]		ND		220	720
Acetophenone		ND		220	720
Bis(2-chloroethyl)ether		ND		220	720
Benzo[a]anthracene		ND		220	720
Indeno[1,2,3-cd]pyrene		ND		220	720
Butyl benzyl phthalate		ND		220	720
Chrysene		ND		220	720
Acenaphthene		ND		220	720
Benzo[b]fluoranthene		ND		220	720

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-0.0/1.0-XXX**

Lab Sample ID: 480-30106-13
Client Matrix: Solid
% Moisture: 9.0

Date Sampled: 12/12/2012 1215
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3201.D
Dilution:	20			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1451	Run Type:	DL	Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND	*	300	3600
4-Chloroaniline		ND	*	650	1400
2-Chlorophenol		ND		220	720
2,6-Dinitrotoluene		ND	*	610	720
Phenol		ND		220	720
3 & 4 Methylphenol		ND		220	720
1,4-Dichlorobenzene		ND		220	720
Bis(2-chloroethoxy)methane		ND		220	720
2-Chloronaphthalene		ND		220	720
N-Nitrosodi-n-propylamine		ND		220	720
4-Chlorophenyl phenyl ether		ND		220	720
4-Chloro-3-methylphenol		ND		220	1400
Benzo[a]pyrene		ND		220	720
4-Methylphenol		ND		220	720
4-Nitroaniline		ND		610	3600
2-Nitroaniline		ND		910	3600
Caprolactam		ND		220	720
Carbazole		ND		220	720
4,6-Dinitro-2-methylphenol		ND		690	3600
1-Methylnaphthalene		ND		220	720
N-Nitrosodiphenylamine		ND		220	720
Atrazine		ND		220	720
Phenyl ether		ND		220	720
Benzaldehyde		ND		220	720
Azobenzene		ND		220	720
Hexachlorocyclopentadiene		ND		220	1400
3-Nitroaniline		ND		220	3600
N-Nitrosodimethylamine		ND		220	720
Benzyl alcohol		ND		220	1400
1,1'-Biphenyl		ND		220	720
2,3,4,6-Tetrachlorophenol		ND		220	720
Benzophenone		ND		220	720
Benzoic acid		ND		330	3600

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	0	X	30 - 130
2-Fluorophenol	38		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

3/21/13
TC

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-0.0/1.0-XXX**

Lab Sample ID: 480-30106-13
Client Matrix: Solid
% Moisture: 9.0

Date Sampled: 12/12/2012 1215
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3201.D
Dilution:	20			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1451	Run Type:	DL	Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 1

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	4.15	3700	T J

TC
3/19/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-6.0/8.0-XXX**

Lab Sample ID: 480-30106-14
Client Matrix: Solid
% Moisture: 9.9

Date Sampled: 12/12/2012 1220
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3181.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 2219			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
~~Bis(2-ethylhexyl) phthalate~~		~~1700~~	~~E~~	~~74~~	~~180~~
2,4,5-Trichlorophenol		ND		12	37
Aniline		ND		11	37
Hexachloroethane		ND		11	37
Dimethyl phthalate		ND		11	37
2,4-Dimethylphenol		ND UJ		11	37
Isophorone		ND		11	37
Fluorene		ND		11	37
Dibenzofuran		ND		11	37
Acenaphthylene		ND		11	37
2,4-Dichlorophenol		ND		11	37
Benzo[g,h,i]perylene		ND		11	37
Hexachlorobenzene		ND		11	37
Di-n-octyl phthalate		ND		11	37
Hexachlorobutadiene		ND		11	37
Phenanthrene		ND		11	37
2-Nitrophenol		ND UJ		14	37
Benzo[k]fluoranthene		ND		19	37
2,4-Dinitrophenol		~~ND~~ R		30	37
Anthracene		ND		11	37
2-Methylnaphthalene		ND		11	37
Di-n-butyl phthalate		ND		55	180
1,2,4-Trichlorobenzene		ND		11	37
Pyrene		ND		11	37
2,4-Dinitrotoluene		ND		11	37
Dibenz(a,h)anthracene		ND		11	37
1,3-Dichlorobenzene		ND		11	37
Nitrobenzene		ND		11	37
Naphthalene		ND		11	37
2,4,6-Trichlorophenol		ND		15	37
Pentachlorophenol		ND		11	37
Fluoranthene		ND		11	37
3,3'-Dichlorobenzidine		ND		13	74
4-Bromophenyl phenyl ether		ND		11	37
Diethyl phthalate		ND		12	37
2-Methylphenol		ND		11	37
1,2-Dichlorobenzene		ND		11	37
2,2'-oxybis[1-chloropropane]		ND		11	37
Acetophenone		ND		11	37
Bis(2-chloroethyl)ether		ND		11	37
Benzo[a]anthracene		ND		11	37
Indeno[1,2,3-cd]pyrene		ND		11	37
Butyl benzyl phthalate		ND		11	37
Chrysene		ND		11	37
Acenaphthene		ND		11	37
Benzo[b]fluoranthene		ND		11	37

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-6.0/8.0-XXX**

Lab Sample ID: 480-30106-14

Client Matrix: Solid

% Moisture: 9.9

Date Sampled: 12/12/2012 1220

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3181.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 2219			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		~~ND~~ R		15	180
4-Chloroaniline		ND UJ		33	74
2-Chlorophenol		ND		11	37
2,6-Dinitrotoluene		ND UJ		31	37
Phenol		ND		11	37
3 & 4 Methylphenol		ND		11	37
1,4-Dichlorobenzene		ND		11	37
Bis(2-chloroethoxy)methane		ND		11	37
2-Chloronaphthalene		ND		11	37
N-Nitrosodi-n-propylamine		ND		11	37
4-Chlorophenyl phenyl ether		ND		11	37
4-Chloro-3-methylphenol		ND		11	74
Benzo[a]pyrene		ND		11	37
4-Methylphenol		ND UJ		11	37
4-Nitroaniline		ND		31	180
2-Nitroaniline		ND		46	180
Caprolactam		ND		11	37
Carbazole		ND		11	37
4,6-Dinitro-2-methylphenol		ND		35	180
1-Methylnaphthalene		ND		11	37
N-Nitrosodiphenylamine		ND		11	37
Atrazine		ND		11	37
Phenyl ether		ND		11	37
Benzaldehyde		ND		11	37
Azobenzene		ND		11	37
Hexachlorocyclopentadiene		ND		11	74
3-Nitroaniline		ND		11	180
N-Nitrosodimethylamine		ND UJ		11	37
Benzyl alcohol		~~ND~~ R		11	74
1,1'-Biphenyl		ND		11	37
2,3,4,6-Tetrachlorophenol		ND		11	37
Benzophenone		ND		11	37
Benzoic acid		ND UJ		17	180
1,2,4,5-Tetrachlorobenzene		ND		11	37

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	79		30 - 130
2-Fluorophenol	72		30 - 130
Nitrobenzene-d5	60		30 - 130
Phenol-d5	72		30 - 130
2-Fluorobiphenyl	89		30 - 130
p-Terphenyl-d14	73		30 - 130

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-6.0/8.0-XXX**

Lab Sample ID: 480-30106-14

Client Matrix: Solid

% Moisture: 9.9

Date Sampled: 12/12/2012 1220

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3181.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 2219			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 7

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~3.85~~	~~32~~	~~T J~~
	~~Unknown~~	~~4.21~~	~~3400~~	~~T J~~
	Unknown	4.65	21	~~T~~ J N
	Unknown	6.33	22	~~T~~ J N
	Unknown	9.61	36	~~T~~ J N
	Unknown	9.72	21	~~T~~ J N
	Unknown	15.30	44	~~T~~ J N

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-6.0/8.0-XXX**

Lab Sample ID: 480-30106-14
Client Matrix: Solid
% Moisture: 9.9

Date Sampled: 12/12/2012 1220
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3194.D
Dilution:	10			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/20/2012 1152	Run Type:	DL	Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		3300		740	1800
2,4,5-Trichlorophenol		ND		120	370
Aniline		ND		110	370
Hexachloroethane		ND		110	370
Dimethyl phthalate		ND		110	370
2,4-Dimethylphenol		ND	*	110	370
Isophorone		ND		110	370
Fluorene		ND		110	370
Dibenzofuran		ND		110	370
Acenaphthylene		ND		110	370
2,4-Dichlorophenol		ND		110	370
Benzo[g,h,i]perylene		ND		110	370
Hexachlorobenzene		ND		110	370
Di-n-octyl phthalate		ND		110	370
Hexachlorobutadiene		ND		110	370
Phenanthrene		ND		110	370
2-Nitrophenol		ND	*	140	370
Benzo[k]fluoranthene		ND		190	370
2,4-Dinitrophenol		ND	*	300	370
Anthracene		ND		110	370
2-Methylnaphthalene		ND		110	370
Di-n-butyl phthalate		ND		550	1800
1,2,4-Trichlorobenzene		ND		110	370
Pyrene		ND		110	370
2,4-Dinitrotoluene		ND		110	370
Dibenz(a,h)anthracene		ND		110	370
1,3-Dichlorobenzene		ND		110	370
Nitrobenzene		ND		110	370
Naphthalene		ND		110	370
2,4,6-Trichlorophenol		ND		150	370
Pentachlorophenol		ND		110	370
Fluoranthene		ND		110	370
3,3'-Dichlorobenzidine		ND		130	740
4-Bromophenyl phenyl ether		ND		110	370
Diethyl phthalate		ND		120	370
2-Methylphenol		ND		110	370
1,2-Dichlorobenzene		ND		110	370
2,2'-oxybis[1-chloropropane]		ND		110	370
Acetophenone		ND		110	370
Bis(2-chloroethyl)ether		ND		110	370
Benzo[a]anthracene		ND		110	370
Indeno[1,2,3-cd]pyrene		ND		110	370
Butyl benzyl phthalate		ND		110	370
Chrysene		ND		110	370
Acenaphthene		ND		110	370
Benzo[b]fluoranthene		ND		110	370

3/21/13
TC

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-6.0/8.0-XXX**

Lab Sample ID: 480-30106-14

Client Matrix: Solid

% Moisture: 9.9

Date Sampled: 12/12/2012 1220

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3194.D
Dilution:	10			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/20/2012 1152	Run Type:	DL	Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND	*	150	1800
4-Chloroaniline		ND	*	330	740
2-Chlorophenol		ND		110	370
2,6-Dinitrotoluene		ND	*	310	370
Phenol		ND		110	370
3 & 4 Methylphenol		ND		110	370
1,4-Dichlorobenzene		ND		110	370
Bis(2-chloroethoxy)methane		ND		110	370
2-Chloronaphthalene		ND		110	370
N-Nitrosodi-n-propylamine		ND		110	370
4-Chlorophenyl phenyl ether		ND		110	370
4-Chloro-3-methylphenol		ND		110	740
Benzo[a]pyrene		ND		110	370
4-Methylphenol		ND		110	370
4-Nitroaniline		ND		310	1800
2-Nitroaniline		ND		460	1800
Caprolactam		ND		110	370
Carbazole		ND		110	370
4,6-Dinitro-2-methylphenol		ND		350	1800
1-Methylnaphthalene		ND		110	370
N-Nitrosodiphenylamine		ND		110	370
Atrazine		ND		110	370
Phenyl ether		ND		110	370
Benzaldehyde		ND		110	370
Azobenzene		ND		110	370
Hexachlorocyclopentadiene		ND		110	740
3-Nitroaniline		ND		110	1800
N-Nitrosodimethylamine		ND		110	370
Benzyl alcohol		ND		110	740
1,1'-Biphenyl		ND		110	370
2,3,4,6-Tetrachlorophenol		ND		110	370
Benzophenone		ND		110	370
Benzoic acid		ND		170	1800
1,2,4,5-Tetrachlorobenzene		ND		110	370

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	80		30 - 130

3/21/13
TC

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-6.0/8.0-XXX**

Lab Sample ID: 480-30106-14
Client Matrix: Solid
% Moisture: 9.9

Date Sampled: 12/12/2012 1220
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3194.D
Dilution:	10			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/20/2012 1152	Run Type:	DL	Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 1

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	4.14	4700	T J

TC
3/19/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-18/20-XXX**

Lab Sample ID: 480-30106-15
Client Matrix: Solid
% Moisture: 21.9

Date Sampled: 12/12/2012 1240
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3182.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 2245			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		85	210
2,4,5-Trichlorophenol		ND		14	42
Aniline		ND		13	42
Hexachloroethane		ND		13	42
Dimethyl phthalate		ND		13	42
2,4-Dimethylphenol		ND UJ		13	42
Isophorone		ND		13	42
Fluorene		ND		13	42
Dibenzofuran		ND		13	42
Acenaphthylene		ND		13	42
2,4-Dichlorophenol		ND		13	42
Benzo[g,h,i]perylene		ND		13	42
Hexachlorobenzene		ND		13	42
Di-n-octyl phthalate		ND		13	42
Hexachlorobutadiene		ND		13	42
Phenanthrene		ND		13	42
2-Nitrophenol		ND UJ		17	42
Benzo[k]fluoranthene		ND		22	42
2,4-Dinitrophenol		~~ND~~ R		34	42
Anthracene		ND		13	42
2-Methylnaphthalene		ND		13	42
Di-n-butyl phthalate		ND		64	210
1,2,4-Trichlorobenzene		ND		13	42
Pyrene		ND		13	42
2,4-Dinitrotoluene		ND		13	42
Dibenz(a,h)anthracene		ND		13	42
1,3-Dichlorobenzene		ND		13	42
Nitrobenzene		ND		13	42
Naphthalene		ND		13	42
2,4,6-Trichlorophenol		ND		18	42
Pentachlorophenol		ND		13	42
Fluoranthene		ND		13	42
3,3'-Dichlorobenzidine		ND		15	85
4-Bromophenyl phenyl ether		ND		13	42
Diethyl phthalate		ND		14	42
2-Methylphenol		ND		13	42
1,2-Dichlorobenzene		ND		13	42
2,2'-oxybis[1-chloropropane]		ND		13	42
Acetophenone		ND		13	42
Bis(2-chloroethyl)ether		ND		13	42
Benzo[a]anthracene		ND		13	42
Indeno[1,2,3-cd]pyrene		ND		13	42
Butyl benzyl phthalate		ND		13	42
Chrysene		ND		13	42
Acenaphthene		ND		13	42
Benzo[b]fluoranthene		ND		13	42

3/21/13

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-18/20-XXX**

Lab Sample ID: 480-30106-15

Client Matrix: Solid

% Moisture: 21.9

Date Sampled: 12/12/2012 1240

Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3182.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 2245			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND R	*	18	210
4-Chloroaniline		ND UJ	*	38	85
2-Chlorophenol		ND		13	42
2,6-Dinitrotoluene		ND UJ	*	36	42
Phenol		ND		13	42
3 & 4 Methylphenol		ND		13	42
1,4-Dichlorobenzene		ND		13	42
Bis(2-chloroethoxy)methane		ND		13	42
2-Chloronaphthalene		ND		13	42
N-Nitrosodi-n-propylamine		ND		13	42
4-Chlorophenyl phenyl ether		ND		13	42
4-Chloro-3-methylphenol		ND		13	85
Benzo[a]pyrene		ND		13	42
4-Methylphenol		ND UJ		13	42
4-Nitroaniline		ND		36	210
2-Nitroaniline		ND		53	210
Caprolactam		ND		13	42
Carbazole		ND		13	42
4,6-Dinitro-2-methylphenol		ND		41	210
1-Methylnaphthalene		ND		13	42
N-Nitrosodiphenylamine		ND		13	42
Atrazine		ND		13	42
Phenyl ether		ND		13	42
Benzaldehyde		ND		13	42
Azobenzene		ND		13	42
Hexachlorocyclopentadiene		ND		13	85
3-Nitroaniline		ND		13	210
N-Nitrosodimethylamine		ND UJ		13	42
Benzyl alcohol		~~ND~~ R		13	85
1,1'-Biphenyl		ND		13	42
2,3,4,6-Tetrachlorophenol		ND		13	42
Benzophenone		ND		13	42
Benzoic acid		ND UJ		19	210
1,2,4,5-Tetrachlorobenzene		ND		13	42

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	93		30 - 130
2-Fluorophenol	89		30 - 130
Nitrobenzene-d5	79		30 - 130
Phenol-d5	90		30 - 130
2-Fluorobiphenyl	81		30 - 130
p-Terphenyl-d14	78		30 - 130

3/21/13
TC

Client: Olin Corporation

Job Number: 480-30106-1

Client Sample ID: **OC-SB-517-18/20-XXX**

Lab Sample ID: 480-30106-15
Client Matrix: Solid
% Moisture: 21.9

Date Sampled: 12/12/2012 1240
Date Received: 12/12/2012 1800

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3182.D
Dilution:	1.0			Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 2245			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 7

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~3.86~~	~~59~~	~~T J~~
	~~Unknown~~	~~4.22~~	~~4900~~	~~T J~~
~~95-47-6~~	~~Benzene, 1,2-dimethyl-~~	~~4.66~~	~~31~~	~~T J N~~
	Unknown	6.34	28	~~T~~ J N
	Unknown	15.87	23	~~T~~ J N
112-95-8	Eicosane	16.40	48	~~T~~ J N
629-78-7	Heptadecane	16.68	48	~~T~~ J N

TC
3/19/13

FORM V
GC/MS SEMI VOA INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Lab File ID: X3154.D DFTPP Injection Date: 12/19/2012

Instrument ID: HP5973X DFTPP Injection Time: 11:00

Analysis Batch No.: 96568

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30.0 - 60.0 % of mass 198	59.1	
68	Less than 2.0 % of mass 69	0.2	(0.5)1
69	Mass 69 relative abundance	50.9	
70	Less than 2.0 % of mass 69	0.4	(0.7)1
127	40.0 - 60.0 % of mass 198	59.6	
197	Less than 1.0 % of mass 198	0.0	
198	Base Peak, 100 % relative abundance	100.0	
199	5.0- 9.0 % of mass 198	7.1	
275	10.0 - 30.0 % of mass 198	26.8	
365	Greater than 1.0 % of mass 198	3.7	
441	Present but less than mass 443	12.6	(75.1)3
442	Greater than 40.0 % of mass 198	85.3	
443	17.0 - 23.0 % of mass 442	16.8	(19.7)2

1-Value is % mass 69 2-Value is % mass 442 3-Value is % mass 443

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

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
Benzoic Acid %D = 27	CCVIS 480-96568/2	X3155.D	12/19/2012	11:16
	MB 480-96302/1-A	X3169.D	12/19/2012	17:13
	LCS 480-96302/2-A	X3170.D	12/19/2012	17:38
	LCSD 480-96302/3-A	X3171.D	12/19/2012	18:04
OC-SB-514-15/17-XXX MS	480-30106-6 MS	X3172.D	12/19/2012	18:29
OC-SB-514-15/17-XXX MSD	480-30106-6 MSD	X3173.D	12/19/2012	18:55
OC-SB-514-7.0/9.0-XXX	480-30106-5	X3174.D	12/19/2012	19:21
OC-SB-514-15/17-XXX	480-30106-6	X3175.D	12/19/2012	19:47
OC-SB-515-6.0/8.0-XXX	480-30106-8	X3176.D	12/19/2012	20:12
OC-SB-516-6.0/8.0-XXX	480-30106-11	X3178.D	12/19/2012	21:03
OC-SB-516-15/17-XXX	480-30106-12	X3179.D	12/19/2012	21:28
OC-SB-517-0.0/1.0-XXX	480-30106-13	X3180.D	12/19/2012	21:54
OC-SB-517-6.0/8.0-XXX	480-30106-14	X3181.D	12/19/2012	22:19
OC-SB-517-18/20-XXX	480-30106-15	X3182.D	12/19/2012	22:45

LCS % Recoveries out

	% Rec LCS	% Rec LCSD	Action
2,4-Dinitrophenol	11	0	Reject
Benzyl Alcohol	3	0	
4-Nitrophenol	0	0	
4-Chloroaniline	37	52 OK	VJ
2,6-Dinitrotoluene	31	33	

TC
3/14/13

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Lab Sample ID: CCVIS 480-96568/2 Calibration Date: 12/19/2012 11:16

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: X3155.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,4-Dioxane	Lin1		0.5232		8180	8000	2.3	20.0
N-Nitrosodimethylamine	Ave	0.9135	1.000		8760	8000	9.4	20.0
Pyridine	Ave	0.9276	0.9874		8520	8000	6.5	20.0
Benzaldehyde	Ave	0.9800	1.090	0.0100	8890	8000	11.2	20.0
Aniline	Ave	1.831	1.901		8310	8000	3.8	20.0
Phenol	Ave	1.523	1.498	0.7000	7870	8000	-1.6	20.0
Bis(2-chloroethyl)ether	Ave	1.199	1.250	0.6000	8340	8000	4.3	20.0
2-Chlorophenol	Ave	1.295	1.385	0.8000	8560	8000	6.9	20.0
1,3-Dichlorobenzene	Ave	1.606	1.554		7740	8000	-3.3	20.0
1,4-Dichlorobenzene	Ave	1.604	1.588		7920	8000	-1.0	20.0
1,2-Dichlorobenzene	Ave	1.496	1.550		8290	8000	3.6	20.0
Benzyl alcohol	QuaF		0.3953		6990	8000	-12.6	20.0
2-Methylphenol	Ave	1.087	1.122	0.6000	8260	8000	3.2	20.0
2,2'-oxybis[1-chloropropane]	Ave	1.949	1.974	0.0100		8000	1.3	20.0
Acetophenone	Ave	1.854	2.018	0.0100	8710	8000	8.8	20.0
N-Nitrosodi-n-propylamine	Ave	0.9313	1.049	0.0500	9010	8000	12.6	20.0
4-Methylphenol	Ave	1.101	1.102	0.6000	8010	8000	0.1	20.0
Hexachloroethane	Lin1		0.6376	0.3000	8010	8000	0.2	20.0
Nitrobenzene	Ave	0.3891	0.4199	0.1000	8630	8000	7.9	20.0
Isophorone	Ave	0.6400	0.6968	0.3000	8710	8000	8.9	20.0
2-Nitrophenol	Ave	0.1771	0.1999	0.0500	9030	8000	12.9	20.0
2,4-Dimethylphenol	Ave	0.3340	0.3395	0.1000	8130	8000	1.6	20.0
Bis(2-chloroethoxy)methane	Ave	0.3791	0.4093	0.2000	8640	8000	8.0	20.0
Benzoic acid	QuaF		0.2299		10200	8000	27.2*	20.0
2,4-Dichlorophenol	Ave	0.2718	0.2680	0.1000	7890	8000	-1.4	20.0
1,2,4-Trichlorobenzene	Ave	0.3341	0.3381		8090	8000	1.2	20.0
Naphthalene	Ave	1.108	1.129	0.6000	8150	8000	1.9	20.0
4-Chloroaniline	Ave	0.4008	0.4569	0.0100	9120	8000	14.0	20.0
Hexachlorobutadiene	Ave	0.1826	0.1871	0.0100	8200	8000	2.5	20.0
Caprolactam	Ave	0.0989	0.1173	0.0100	9490	8000	18.6	20.0
4-Chloro-3-methylphenol	Ave	0.3003	0.3333	0.2000	8880	8000	11.0	20.0
2-Methylnaphthalene	Ave	0.7764	0.8081	0.4000	8330	8000	4.1	20.0
1-Methylnaphthalene	Ave	0.7151	0.7229			8000	1.1	20.0
Hexachlorocyclopentadiene	QuaF		0.1988	0.0500	8570	8000	7.1	20.0
1,2,4,5-Tetrachlorobenzene	Ave	0.4691	0.5028	0.0100	8570	8000	7.2	20.0
2,4,6-Trichlorophenol	Ave	0.2887	0.3276	0.2000	9080	8000	13.5	20.0
2,4,5-Trichlorophenol	Ave	0.2793	0.3092	0.2000	8860	8000	10.7	20.0
1,1'-Biphenyl	Ave	1.446	1.552	0.0100	8590	8000	7.3	20.0
2-Chloronaphthalene	Lin1		1.132	0.8000	8100	8000	1.3	20.0
Phenyl ether	Ave	0.7862	0.8161		8300	8000	3.8	20.0
2-Nitroaniline	Ave	0.3311	0.3808	0.0100	9200	8000	15.0	20.0

FORM VII 8270D

TC 3/14/13

03/11/2013

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X3170.D

Lab ID: LCS 480-96302/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
Bis(2-ethylhexyl) phthalate	65.6	ND	86	40-140	
2,4,5-Trichlorophenol	65.6	60.3	92	30-130	
Aniline	65.6	32.4 J	49	40-140	
Hexachloroethane	65.6	46.1	70	40-140	
Dimethyl phthalate	65.6	49.6	76	40-140	
N-Nitrosodi-n-propylamine	65.6	45.3	69		
4-Chlorophenyl phenyl ether	65.6	47.8	73		
2,4-Dimethylphenol	65.6	41.5	63	30-130	
4-Chloro-3-methylphenol	65.6	52.6 J	80		
Isophorone	65.6	50.7	77	40-140	
Benzo[a]pyrene	65.6	51.3	78	40-140	
Fluorene	65.6	46.6	71	40-140	
4-Methylphenol	65.6	48.7	74		
4-Nitroaniline	65.6	48.3 J	74		
Dibenzofuran	65.6	49.9	76	40-140	
Acenaphthylene	65.6	49.6	76	40-140	
2,4-Dichlorophenol	65.6	49.9	76	30-130	
2-Nitroaniline	65.6	54.4 J	83		
Benzo[g,h,i]perylene	65.6	62.8	96	40-140	
Hexachlorobenzene	65.6	57.2	87	40-140	
Di-n-octyl phthalate	65.6	50.6	77	40-140	
Hexachlorobutadiene	65.6	50.5	77	40-140	
Phenanthrene	65.6	53.5	82	40-140	
2-Nitrophenol	65.6	35.9	55	30-130	
4,6-Dinitro-2-methylphenol	65.6	55.7 J	85		
Benzo[k]fluoranthene	65.6	52.1	79	40-140	
2,4-Dinitrophenol	65.6	ND	11	30-130	*
Anthracene	65.6	50.7	77	40-140	
N-Nitrosodiphenylamine	65.6	24.5 J	37		
2-Methylnaphthalene	65.6	52.5	80	40-140	
Di-n-butyl phthalate	65.6	54.8 J	84	40-140	
1,2,4-Trichlorobenzene	65.6	50.2	77	40-140	
Pyrene	65.6	60.8	93	40-140	
2,4-Dinitrotoluene	65.6	43.3	66	40-140	
Dibenz(a,h)anthracene	65.6	54.5	83	40-140	
1,3-Dichlorobenzene	65.6	45.0	69	40-140	
Nitrobenzene	65.6	47.6	73	40-140	
Azobenzene	65.6	62.2	95	40-140	
Naphthalene	65.6	48.9	75	40-140	
2,4,6-Trichlorophenol	65.6	53.9	82	30-130	
Hexachlorocyclopentadiene	65.6	35.3 J	54		
3-Nitroaniline	65.6	35.7 J	54		

Column to be used to flag recovery and RPD values

FORM III 8270D

TC 3/14/13

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X3170.D

Lab ID: LCS 480-96302/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
Pentachlorophenol	65.6	56.2	86	30-130	
Fluoranthene	65.6	46.2	71	40-140	
3,3'-Dichlorobenzidine	65.6	29.8 J	45	40-140	
N-Nitrosodimethylamine	65.6	31.1 J	47		
4-Bromophenyl phenyl ether	65.6	54.1	82	40-140	
Benzyl alcohol	65.6	ND	3		
Diethyl phthalate	65.6	51.0	78	40-140	
Benzoic acid	65.6	70.6 J	108		
2-Methylphenol	65.6	44.5	68	30-130	
1,2-Dichlorobenzene	65.6	44.1	67	40-140	
2,2'-oxybis[1-chloropropane]	65.6	46.8	71	40-140	
Bis(2-chloroethyl)ether	65.6	48.4	74	40-140	
Benzo[a]anthracene	65.6	49.5	76	40-140	
Indeno[1,2,3-cd]pyrene	65.6	57.5	88	40-140	
Butyl benzyl phthalate	65.6	54.0	82	40-140	
Chrysene	65.6	62.4	95	40-140	
Acenaphthene	65.6	49.0	75	40-140	
Benzo[b]fluoranthene	65.6	49.3	75	40-140	
4-Nitrophenol	65.6	ND	0	30-130	*
4-Chloroaniline	65.6	ND	37	40-140	*
2-Chlorophenol	65.6	43.5	66	30-130	
2,6-Dinitrotoluene	65.6	ND	31	40-140	*
Phenol	65.6	46.2	71	30-130	
1,4-Dichlorobenzene	65.6	45.1	69	40-140	
Bis(2-chloroethoxy)methane	65.6	43.3	66	40-140	
2-Chloronaphthalene	65.6	31.5 J	48	40-140	

68 compounds

Column to be used to flag recovery and RPD values

FORM III 8270D

TC 3/14/13

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

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X3171.D

Lab ID: LCSD 480-96302/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Bis(2-ethylhexyl) phthalate	66.2	ND	99	15	30	40-140	
2,4,5-Trichlorophenol	66.2	62.7	95	4	30	30-130	
Aniline	66.2	43.4	66	29	30	40-140	
Hexachloroethane	66.2	53.3	81	15	30	40-140	
Dimethyl phthalate	66.2	53.9	81	8	30	40-140	
N-Nitrosodi-n-propylamine	66.2	48.2	73	6			
4-Chlorophenyl phenyl ether	66.2	54.6	82	13			
2,4-Dimethylphenol	66.2	65.6	99	45	30	30-130	*
4-Chloro-3-methylphenol	66.2	61.1 J	92	15			
Isophorone	66.2	59.3	90	16	30	40-140	
Benzo[a]pyrene	66.2	56.2	85	9	30	40-140	
Fluorene	66.2	55.0	83	17	30	40-140	
4-Methylphenol	66.2	72.8	110	40			
4-Nitroaniline	66.2	57.4 J	87	17			
Dibenzofuran	66.2	58.2	88	15	30	40-140	
Acenaphthylene	66.2	61.9	93	22	30	40-140	
2,4-Dichlorophenol	66.2	56.0	85	12	30	30-130	
2-Nitroaniline	66.2	55.7 J	84	2			
Benzo[g,h,i]perylene	66.2	67.3	102	7	30	40-140	
Hexachlorobenzene	66.2	67.7	102	17	30	40-140	
Di-n-octyl phthalate	66.2	57.6	87	13	30	40-140	
Hexachlorobutadiene	66.2	61.3	93	19	30	40-140	
Phenanthrene	66.2	56.2	85	5	30	40-140	
2-Nitrophenol	66.2	50.8	77	35	30	30-130	*
4,6-Dinitro-2-methylphenol	66.2	59.1 J	89	6			
Benzo[k]fluoranthene	66.2	59.8	90	14	30	40-140	
2,4-Dinitrophenol	66.2	ND	0	200	30	30-130	*
Anthracene	66.2	57.2	86	12	30	40-140	
N-Nitrosodiphenylamine	66.2	25.6 J	39	4			
2-Methylnaphthalene	66.2	60.1	91	13	30	40-140	
Di-n-butyl phthalate	66.2	60.7 J	92	10	30	40-140	
1,2,4-Trichlorobenzene	66.2	53.3	81	6	30	40-140	
Pyrene	66.2	70.6	107	15	30	40-140	
2,4-Dinitrotoluene	66.2	42.0	63	3	30	40-140	
Dibenz(a,h)anthracene	66.2	64.0	97	16	30	40-140	
1,3-Dichlorobenzene	66.2	51.6	78	14	30	40-140	
Nitrobenzene	66.2	50.1	76	5	30	40-140	
Azobenzene	66.2	66.0	100	6	30	40-140	
Naphthalene	66.2	54.4	82	11	30	40-140	
2,4,6-Trichlorophenol	66.2	54.9	83	2	30	30-130	
Hexachlorocyclopentadiene	66.2	44.6 J	67	23			
3-Nitroaniline	66.2	39.1 J	59	9			

Column to be used to flag recovery and RPD values

FORM III 8270D

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

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X3171.D

Lab ID: LCSD 480-96302/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Pentachlorophenol	66.2	60.2	91	7	30	30-130	
Fluoranthene	66.2	50.6	76	9	30	40-140	
3,3'-Dichlorobenzidine	66.2	38.1 J	58	25	30	40-140	
N-Nitrosodimethylamine	66.2	44.1	67	35			
4-Bromophenyl phenyl ether	66.2	61.2	92	12	30	40-140	
Benzyl alcohol	66.2	ND	0	200			
Diethyl phthalate	66.2	54.6	82	7	30	40-140	
Benzoic acid	66.2	76.1 J	115	7			
2-Methylphenol	66.2	51.2	77	14	30	30-130	
1,2-Dichlorobenzene	66.2	52.7	80	18	30	40-140	
2,2'-oxybis[1-chloropropane]	66.2	53.5	81	13	30	40-140	
Bis(2-chloroethyl)ether	66.2	58.7	89	19	30	40-140	
Benzo[a]anthracene	66.2	54.1	82	9	30	40-140	
Indeno[1,2,3-cd]pyrene	66.2	67.0	101	15	30	40-140	
Butyl benzyl phthalate	66.2	63.7	96	16	30	40-140	
Chrysene	66.2	67.3	102	8	30	40-140	
Acenaphthene	66.2	51.6	78	5	30	40-140	
Benzo[b]fluoranthene	66.2	60.1	91	20	30	40-140	
4-Nitrophenol	66.2	ND	0	NC	30	30-130	*
4-Chloroaniline	66.2	34.4 J	52	33	30	40-140	*
2-Chlorophenol	66.2	58.6	89	30	30	30-130	
2,6-Dinitrotoluene	66.2	ND	33	9	30	40-140	*
Phenol	66.2	56.6	85	20	30	30-130	
1,4-Dichlorobenzene	66.2	51.9	78	14	30	40-140	
Bis(2-chloroethoxy)methane	66.2	53.8	81	22	30	40-140	
2-Chloronaphthalene	66.2	37.8	57	18	30	40-140	

Column to be used to flag recovery and RPD values

FORM III 8270D

TC 3/14/13

FORM III
GC/MS SEMI VOA MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X3172.D

Lab ID: 480-30106-6 MS Client ID: OC-SB-514-15/17-XXX MS

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC	QC LIMITS REC	#	
Bis(2-ethylhexyl) phthalate	72.0	ND	63.5 ND	88 ~~NC~~	40-140		
2,4,5-Trichlorophenol	72.0	ND	46.0	64	30-130		
Aniline	72.0	ND	37.3	52	40-140		
Hexachloroethane	72.0	ND	52.2	73	40-140		
Dimethyl phthalate	72.0	ND	56.5	79	40-140		
2,4-Dimethylphenol	72.0	ND	42.0	58	30-130		
Isophorone	72.0	ND	58.7	82	40-140		
Fluorene	72.0	ND	57.2	79	40-140		
Dibenzofuran	72.0	ND	58.1	81	40-140		
Acenaphthylene	72.0	ND	55.3	77	40-140		
2,4-Dichlorophenol	72.0	ND	31.7 J	44	30-130		
Benzo[g,h,i]perylene	72.0	ND	69.3	96	40-140		
Hexachlorobenzene	72.0	ND	70.0	97	40-140		
Di-n-octyl phthalate	72.0	ND	59.8	83	40-140		
Hexachlorobutadiene	72.0	ND	52.4	73	40-140		
Phenanthrene	72.0	ND	67.6	94	40-140		
2-Nitrophenol	72.0	ND	37.5	52	30-130		
Benzo[k]fluoranthene	72.0	ND	70.5	98	40-140		
2,4-Dinitrophenol	72.0	ND	ND	0	30-130	F	*
Anthracene	72.0	ND	63.3	88	40-140		
2-Methylnaphthalene	72.0	ND	61.6	86	40-140		
Di-n-butyl phthalate	72.0	ND	65.6 J	91	40-140		
1,2,4-Trichlorobenzene	72.0	ND	53.1	74	40-140		
Pyrene	72.0	ND	74.5	104	40-140		
2,4-Dinitrotoluene	72.0	ND	38.7	54	40-140		
Dibenz(a,h)anthracene	72.0	ND	62.6	87	40-140		
1,3-Dichlorobenzene	72.0	ND	48.3	67	40-140		
Nitrobenzene	72.0	ND	59.6	83	40-140		
Naphthalene	72.0	ND	54.6	76	40-140		
2,4,6-Trichlorophenol	72.0	ND	44.5	62	30-130		
Pentachlorophenol	72.0	ND	ND	0	30-130	F	*
Fluoranthene	72.0	ND	54.5	76	40-140		
3,3'-Dichlorobenzidine	72.0	ND	40.1 J	56	40-140		
4-Bromophenyl phenyl ether	72.0	ND	67.3	94	40-140		
Diethyl phthalate	72.0	ND	57.2	80	40-140		
2-Methylphenol	72.0	ND	44.1	61	30-130		
1,2-Dichlorobenzene	72.0	ND	55.4	77	40-140		
2,2'-oxybis[1-chloropropane]	72.0	ND	50.7	70	40-140		
Bis(2-chloroethyl)ether	72.0	ND	55.6	77	40-140		
Benzo[a]anthracene	72.0	ND	52.7	73	40-140		
Indeno[1,2,3-cd]pyrene	72.0	ND	30.9 J	43	40-140		
Butyl benzyl phthalate	72.0	ND	67.4	94	40-140		

Column to be used to flag recovery and RPD values

* compound not in spike mix TC 3/15/13

FORM III 8270D

FORM III
GC/MS SEMI VOA MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X3172.D

Lab ID: 480-30106-6 MS Client ID: OC-SB-514-15/17-XXX MS

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC	QC LIMITS REC	#	
Chrysene	72.0	ND	74.8	104	40-140		
Acenaphthene	72.0	ND	56.8	79	40-140		
Benzo[b]fluoranthene	72.0	ND	54.1	75	40-140		
4-Nitrophenol	72.0	ND	ND	0	30-130	F	*
4-Chloroaniline	72.0	ND	ND	0	40-140	F	*
2-Chlorophenol	72.0	ND	56.5	79	30-130		
2,6-Dinitrotoluene	72.0	ND	ND	0	40-140	F	*
Phenol	72.0	ND	41.3	57	30-130		
3 & 4 Methylphenol	72.0	ND	43.5	60	30-130		
1,4-Dichlorobenzene	72.0	ND	53.3	74	40-140		
Bis(2-chloroethoxy)methane	72.0	ND	53.3	74	40-140		
2-Chloronaphthalene	72.0	ND	35.8 J	50	40-140		
N-Nitrosodi-n-propylamine	72.0	ND	55.1	77			
4-Chlorophenyl phenyl ether	72.0	ND	60.2	84			
4-Chloro-3-methylphenol	72.0	ND	ND	0			*
Benzo[a]pyrene	72.0	ND	36.9	51	40-140		
4-Methylphenol	72.0	ND	43.5	60			
4-Nitroaniline	72.0	ND	ND	0			*
2-Nitroaniline	72.0	ND	ND	0			*
4,6-Dinitro-2-methylphenol	72.0	ND	ND	0			*
N-Nitrosodiphenylamine	72.0	ND	27.0 J	38	40-140		
Azobenzene	72.0	ND	69.5	97	40-140		
Hexachlorocyclopentadiene	72.0	ND	ND	0			*
3-Nitroaniline	72.0	ND	ND	0			*
N-Nitrosodimethylamine	72.0	ND	ND	0			*
Benzyl alcohol	72.0	ND	ND	0			*
Benzoic acid	72.0	ND	ND	0			*

* Compound not in spike mix

Column to be used to flag recovery and RPD values

TC
3-15-13

FORM III
GC/MS SEMI VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X3173.D

Lab ID: 480-30106-6 MSD Client ID: OC-SB-514-15/17-XXX MSD

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#	
Bis(2-ethylhexyl) phthalate	71.5	74.3 J	104 NC	17% ~~NC~~	30	40-140		
2,4,5-Trichlorophenol	71.5	ND	0	NC	30	30-130	F	*
Aniline	71.5	36.8	52	1	30	40-140		
Hexachloroethane	71.5	49.1	69	6	30	40-140		
Dimethyl phthalate	71.5	53.4	75	6	30	40-140		
2,4-Dimethylphenol	71.5	42.7	60	2	30	30-130		
Isophorone	71.5	51.9	73	12	30	40-140		
Fluorene	71.5	53.3	75	7	30	40-140		
Dibenzofuran	71.5	59.6	83	3	30	40-140		
Acenaphthylene	71.5	58.4	82	6	30	40-140		
2,4-Dichlorophenol	71.5	24.2 J	34	27	30	30-130		
Benzo[g,h,i]perylene	71.5	60.5	85	14	30	40-140		
Hexachlorobenzene	71.5	56.0	78	22	30	40-140		
Di-n-octyl phthalate	71.5	56.0	78	7	30	40-140		
Hexachlorobutadiene	71.5	51.5	72	2	30	40-140		
Phenanthrene	71.5	58.4	82	15	30	40-140		
2-Nitrophenol	71.5	43.4	61	14	30	30-130		
Benzo[k]fluoranthene	71.5	60.3	84	16	30	40-140		
2,4-Dinitrophenol	71.5	ND	0	NC	30	30-130	F	*
Anthracene	71.5	57.1	80	10	30	40-140		
2-Methylnaphthalene	71.5	60.4	84	2	30	40-140		
Di-n-butyl phthalate	71.5	61.0 J	85	7	30	40-140		
1,2,4-Trichlorobenzene	71.5	47.3	66	12	30	40-140		
Pyrene	71.5	68.4	96	9	30	40-140		
2,4-Dinitrotoluene	71.5	41.2	58	6	30	40-140		
Dibenz(a,h)anthracene	71.5	53.0	74	17	30	40-140		
1,3-Dichlorobenzene	71.5	46.1	65	4	30	40-140		
Nitrobenzene	71.5	52.9	74	12	30	40-140		
Naphthalene	71.5	50.6	71	8	30	40-140		
2,4,6-Trichlorophenol	71.5	37.3	52	18	30	30-130		
Pentachlorophenol	71.5	ND	0	NC	30	30-130	F	*
Fluoranthene	71.5	50.8	71	7	30	40-140		
3,3'-Dichlorobenzidine	71.5	37.4 J	52	7	30	40-140		
4-Bromophenyl phenyl ether	71.5	60.6	85	10	30	40-140		
Diethyl phthalate	71.5	56.8	80	1	30	40-140		
2-Methylphenol	71.5	45.9	64	4	30	30-130		
1,2-Dichlorobenzene	71.5	49.5	69	11	30	40-140		
2,2'-oxybis[1-chloropropane]	71.5	49.3	69	3	30	40-140		
Bis(2-chloroethyl)ether	71.5	60.4	85	8	30	40-140		
Benzo[a]anthracene	71.5	50.0	70	5	30	40-140		
Indeno[1,2,3-cd]pyrene	71.5	50.4	71	48	30	40-140	F	
Butyl benzyl phthalate	71.5	64.8	91	4	30	40-140		

Column to be used to flag recovery and RPD values

* Not spiked
not evaluated
See email from Lab

3/15/13 TC

FORM III 8270D

03/11/2013

FORM III
GC/MS SEMI VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X3173.D

Lab ID: 480-30106-6 MSD Client ID: OC-SB-514-15/17-XXX MSD

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#	
Chrysene	71.5	69.7	98	7	30	40-140		
Acenaphthene	71.5	49.5	69	14	30	40-140		
Benzo[b]fluoranthene	71.5	51.4	72	5	30	40-140		
4-Nitrophenol	71.5	ND	0	NC	30	30-130	F	*
4-Chloroaniline	71.5	ND	0	NC	30	40-140	F	*
2-Chlorophenol	71.5	51.8	72	9	30	30-130		
2,6-Dinitrotoluene	71.5	ND	0	NC	30	40-140	F	*
Phenol	71.5	ND	0	NC	30	30-130	F	*
3 & 4 Methylphenol	71.5	33.6 J	47	26	30	30-130		
1,4-Dichlorobenzene	71.5	46.2	65	14	30	40-140		
Bis(2-chloroethoxy)methane	71.5	51.0	71	4	30	40-140		
2-Chloronaphthalene	71.5	32.7 J	46	9	30	40-140		
N-Nitrosodi-n-propylamine	71.5	52.2	73	5				
4-Chlorophenyl phenyl ether	71.5	59.8	84	1				
4-Chloro-3-methylphenol	71.5	11.5 J	16	NC				
Benzo[a]pyrene	71.5	39.7	56	7	30	40-140		
4-Methylphenol	71.5	33.6 J	47	26				
4-Nitroaniline	71.5	ND	0	NC				*
2-Nitroaniline	71.5	ND	0	NC				*
4,6-Dinitro-2-methylphenol	71.5	ND	0	NC				*
N-Nitrosodiphenylamine	71.5	25.9 J	36	4		40-140		
Azobenzene	71.5	61.5	86	12	30	40-140		
Hexachlorocyclopentadiene	71.5	ND	0	NC				*
3-Nitroaniline	71.5	ND	0	NC				
N-Nitrosodimethylamine	71.5	ND	0	NC				
Benzyl alcohol	71.5	ND	0	NC				
Benzoic acid	71.5	ND	0	NC				

*= not reported by lab, compound not in spike mix.

Column to be used to flag recovery and RPD values

3/15/13
TC

FORM III 8270D

Cunningham, Tige L.

From: Mason, Becky [Becky.Mason@testamericainc.com]
Sent: Friday, March 15, 2013 12:50 PM
To: Cunningham, Tige L.
Cc: Ricardi, Christian S.
Subject: RE: Olin Wilm: Matrix spike on 480-30106-6 MS / MSD
Attachments: 8270_LL_MCP_QC_Summary [Std_Tal_L4_Package_Mini].pdf

Here is an updated form. Anything with ND as not spiked.

Becky

From: Cunningham, Tige L. [mailto:Tige.Cunningham@amec.com]
Sent: Thursday, March 14, 2013 10:25 PM
To: Mason, Becky
Cc: Ricardi, Christian S.
Subject: Olin Wilm: Matrix spike on 480-30106-6 MS / MSD

Hi Becky
On the summary form III for this MS/MSD. There are compounds with 0 recovery and a reported concentration of ND and a percent recovery of NC. The first column lists a "spike added ug/kg" concentration for these compounds. See attached. I looked at the raw data and there is no area response for these compounds. Were these compounds spiked?
Tige

Tige Cunningham, NRCC EAC
Project Scientist
AMEC Environment & Infrastructure (Formerly MACTEC)
511 Congress Street, Suite 200 Portland Maine 04101
Direct 207-828-3415 Cell 207-329-0164 E-Mail: Tige.Cunningham@amec.com
Fax 207-772-4762 Corporate Website: www.amec.com
The information contained in this e-mail message is intended only for the personal and confidential use of the recipient(s) named above.

The information contained in this e-mail is intended only for the individual or entity to whom it is addressed.
Its contents (including any attachments) may contain confidential and/or privileged information.
If you are not an intended recipient you must not use, disclose, disseminate, copy or print its contents.
If you receive this e-mail in error, please notify the sender by reply e-mail and delete and destroy the message.

FORM V
GC/MS SEMI VOA INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Lab File ID: X3190.D DFTPP Injection Date: 12/20/2012

Instrument ID: HP5973X DFTPP Injection Time: 10:20

Analysis Batch No.: 96803

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30.0 - 60.0 % of mass 198	55.7	
68	Less than 2.0 % of mass 69	0.0	(0.0)1
69	Mass 69 relative abundance	48.4	
70	Less than 2.0 % of mass 69	0.3	(0.7)1
127	40.0 - 60.0 % of mass 198	59.5	
197	Less than 1.0 % of mass 198	0.0	
198	Base Peak, 100 % relative abundance	100.0	
199	5.0- 9.0 % of mass 198	6.9	
275	10.0 - 30.0 % of mass 198	26.5	
365	Greater than 1.0 % of mass 198	3.8	
441	Present but less than mass 443	13.9	(72.0)3
442	Greater than 40.0 % of mass 198	98.0	
443	17.0 - 23.0 % of mass 442	19.3	(19.6)2

1-Value is % mass 69 2-Value is % mass 442 3-Value is % mass 443

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

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 480-96803/2	X3191.D	12/20/2012	10:36
OC-SB-515-13/15-XXX	480-30106-9	X3192.D	12/20/2012	11:01
OC-SB-517-6.0/8.0-XXX DL	480-30106-14 DL	X3194.D	12/20/2012	11:52
OC-SB-517-0.0/1.0-XXX DL	480-30106-13 DL	X3201.D	12/20/2012	14:51
	MB 480-96561/1-A	X3202.D	12/20/2012	15:17
w/in limits	LCS 480-96561/2-A	X3203.D	12/20/2012	15:42
	LCSD 480-96561/3-A	X3204.D	12/20/2012	16:08
OC-SB-514-0.0/1.0-XXX	480-30106-4	X3205.D	12/20/2012	16:33

4-Nitrophenol 14% UJ Qual samples above

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

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X3204.D

Lab ID: LCSD 480-96561/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Bis(2-ethylhexyl) phthalate	265	254	96	9	30	40-140	
2,4,5-Trichlorophenol	265	254	96	3	30	30-130	
Aniline	291	237	81	5	30	40-140	
Hexachloroethane	265	216	81	3	30	40-140	
Dimethyl phthalate	265	256	96	7	30	40-140	
N-Nitrosodi-n-propylamine	265	237	90	1			
4-Chlorophenyl phenyl ether	265	239	90	0			
2,4-Dimethylphenol	265	249	94	3	30	30-130	
4-Chloro-3-methylphenol	265	275	104	13			
Isophorone	265	242	91	7	30	40-140	
Benzo[a]pyrene	265	248	93	5	30	40-140	
Fluorene	265	236	89	4	30	40-140	
4-Methylphenol	530	515	97	2			
4-Nitroaniline	265	184	69	7			
Dibenzofuran	265	256	97	1	30	40-140	
Acenaphthylene	265	254	96	3	30	40-140	
2,4-Dichlorophenol	265	246	93	8	30	30-130	
2-Nitroaniline	265	277	105	9			
Benzo[g,h,i]perylene	265	154	58	4	30	40-140	
Hexachlorobenzene	265	254	96	1	30	40-140	
Caprolactam	265	309	117	29			
Di-n-octyl phthalate	265	298	113	4	30	40-140	
Carbazole	265	226	85	3			
Hexachlorobutadiene	265	218	82	7	30	40-140	
Phenanthrene	265	255	96	1	30	40-140	
2-Nitrophenol	265	239	90	3	30	30-130	
4,6-Dinitro-2-methylphenol	265	221	83	15			
Benzo[k]fluoranthene	265	302	114	2	30	40-140	
1-Methylnaphthalene	530	486	92	3			
2,4-Dinitrophenol	265	116	44	74	30	30-130	*
Anthracene	265	259	98	2	30	40-140	
N-Nitrosodiphenylamine	265	145	55	1			
2-Methylnaphthalene	265	219	82	7	30	40-140	
Di-n-butyl phthalate	265	277	105	1	30	40-140	
1,2,4-Trichlorobenzene	265	223	84	6	30	40-140	
Atrazine	265	265	100	20	30	40-140	
Pyrene	265	239	90	9	30	40-140	
2,4-Dinitrotoluene	265	242	91	3	30	40-140	
Dibenz(a,h)anthracene	265	172	65	3	30	40-140	
1,3-Dichlorobenzene	265	204	77	4	30	40-140	
Phenyl ether	265	287	108	13			
Benzaldehyde	265	252	95	6			

Column to be used to flag recovery and RPD values

FORM III 8270D

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

Lab Name: TestAmerica Buffalo Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: X3204.D

Lab ID: LCSD 480-96561/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Nitrobenzene	265	232	88	0	30	40-140	
Azobenzene	265	684	258	4	30	40-140	E *
Naphthalene	265	218	82	3	30	40-140	
2,4,6-Trichlorophenol	265	273	103	7	30	30-130	
Hexachlorocyclopentadiene	265	201	76	5			
3-Nitroaniline	260	235	90	29			
Pentachlorophenol	265	260	98	11	30	30-130	
Fluoranthene	265	205	77	2	30	40-140	
3,3'-Dichlorobenzidine	265	242	91	7	30	40-140	
N-Nitrosodimethylamine	265	194	73	3			
4-Bromophenyl phenyl ether	265	277	105	4	30	40-140	
Benzyl alcohol	265	143	54	21			
1,1'-Biphenyl	265	291	110	6			
2,3,4,6-Tetrachlorophenol	530	585	110	17			
Benzophenone	265	283	107	4			
Diethyl phthalate	265	253	95	5	30	40-140	
Benzoic acid	265	376	142	11			
2-Methylphenol	265	239	90	9	30	30-130	
1,2-Dichlorobenzene	265	212	80	4	30	40-140	
2,2'-oxybis[1-chloropropane]	265	209	79	7	30	40-140	
Acetophenone	530	540	102	7	30	40-140	
Bis(2-chloroethyl)ether	265	225	85	3	30	40-140	
Benzo[a]anthracene	265	278	105	0	30	40-140	
1,2-Diphenylhydrazine	530	682	129	4	30	40-140	E
Indeno[1,2,3-cd]pyrene	265	162	61	2	30	40-140	
Butyl benzyl phthalate	265	243	92	8	30	40-140	
Chrysene	265	261	98	10	30	40-140	
Acenaphthene	265	225	85	4	30	40-140	
Benzo[b]fluoranthene	265	267	101	7	30	40-140	
4-Nitrophenol	265	36.2 J	14	147	30	30-130	*
4-Chloroaniline	254	208	82	9	30	40-140	
2-Chlorophenol	265	243	92	3	30	30-130	
2,6-Dinitrotoluene	265	128	48	4	30	40-140	
Phenol	265	250	94	7	30	30-130	
1,4-Dichlorobenzene	265	207	78	0	30	40-140	
Bis(2-chloroethoxy)methane	265	235	89	0	30	40-140	
2-Chloronaphthalene	265	227	86	3	30	40-140	
1,2,4,5-Tetrachlorobenzene	530	604	114	7			

Column to be used to flag recovery and RPD values

TC
3/14/13

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
EXTRACTABLE PETROLEUM HYDROCARBONS BY METHOD MADEP-EPH-98-1

Reviewer/Date Tige Cunningham 2/15/13
Sr. Review/Date
Lab Report # 480-30106-1
LAW Project # 6107130016-10

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* [✓] *Certification ID #* [✓] *Address* [✓] *Project ID* [✓] *Phone #* [✓] *Sample identification – Field and Laboratory (IDs must be cross-referenced)*

Client Information: [✓] *Name* [✓] *Address* [✓] *Phone #* [✓] *Client Contact*

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: *Are both of the following statements true?* ***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) **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include the *original* 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 missing original 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 ☑ Custody seals checked ☑ 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:

Water - 1 Liter amber bottle / 5 ml 1:1 HCl, cool to 4°C
Soil - 4 oz amber soil jar w/ Teflon lined cap / 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

ACTION: If each VOA vial for a sample contains air bubbles or the VOA vial analyzed contained air bubbles, flag positives (J) and reject nondetects (R).

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:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
EXTRACTABLE PETROLEUM HYDROCARBONS BY METHOD MADEP

☑ 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)

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 (N/A) ☐ Laboratory duplicate results (where applicable) (NA) ☑ 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? For water samples, the holding time is 14 days from sampling to extraction and 40 days from extraction to analysis. For soil samples, the holding time is 7 days from sampling to extraction and 40 days from extraction to analysis.

NOTE: List samples that exceeded hold time with number of days exceeded on checklist.

ACTION: If technical holding times are exceeded, qualify all positive results (J) and reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? **Yes** [✓] No [ ] N/A [ ] Comments:

Extractable Petroleum Hydrocarbons MADEP-EPH-98-1

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 **Yes** [✓] No [ ] N/A [ ] Comments:

☐ SOW ☑ QAPP ☐ Lab?

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 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 Was a method blank analyzed for each analysis batch of EPH 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 attached table for PQLs) Yes [ ] **No** [✓] N/A [ ] Comments:

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

If the sample concentration is < 5 × blank value, flag sample result "JB"

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 Standard

5.1 Was a laboratory control standard 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, reject (R) data 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 of 40-140%? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: *A second source LCS containing at least five target analytes from each fraction is required by MADEP.*

NOTE: *MADEP guidelines list LCS recovery limits as 40-140 for all analytes except C36. The laboratory must identify analytes that routinely exceed these limits. See the attached table for a listing of MADEP LCS control limits vs. the control limits listed in the QAPP.*

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%, positive and non-detect results are rejected (R) unless the QC limit for that compound is below 10% (flag as above).

5.4 Are 80% of LCS recoveries within laboratory control limits? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If 80% of LCS recoveries are not within limits, use professional judgment and consult Senior Chemist. If more than half of the recoveries are above control limits, qualify all positive results as (J). If more than half of the recoveries are below control limits, batch may require rejection and reanalysis

6.0 Matrix Spikes

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

Yes [ ] No [✓] N/A [ ] Comments: NO MS/MSD Samples in this SDG

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 EPH 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: *A second source MS/MSD containing at least five target analytes from each fraction is required by MADEP.*

NOTE: *MADEP guidelines list MS/MSD recovery limits as 40-140 for all analytes except C36. The laboratory must identify analytes that routinely exceed these limits. See the attached table for a listing of MADEP LCS control limits vs. the control limits listed in the QAPP*

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.

NOTE: 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.

ACTION: MS/MSD flags only apply to the sample spiked. 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).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits of ≤ *50 for soil and ≤ 30 for water*? 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: *MADEP guidelines list MS/MSD RPD limits for water and soil as ≤ 50. See the attached table for a listing of MADEP MS/MSD RPD limits vs. the control limits listed in the QAPP.*

NOTE: 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 are evaluated, but no flags are applied.

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

7.0 Surrogate Recoveries

Were one or more EPH surrogate recoveries outside of laboratory limits for any sample or method blank? If yes, were samples re-analyzed? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: %R = QD x 100% Where: S = MS sample result
D = MSD sample result

NOTE: *MADEP guidelines require at least two extraction and two fractionation surrogates, and lists recovery limits as 40-140% for all surrogates. See the attached table for a listing of MADEP surrogate limits vs. the control limits listed in the QAPP*

NOTE: If surrogate recoveries fail due to dilution, results are not flagged. Document on checklist and in the case narrative.

ACTION: If recoveries are >10%, but fail to meet QC criteria: (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 QC limits are below 10%, in which case, results are flagged as stated above), flag positives (J) and reject nondetects (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:

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

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

ACTION: Evaluate rinsate results against other blank results to determine if contaminant may be laboratory-, ambient, or shipment-derived. If results are not lab-, ambient, or shipment related, qualify according to the table below.

Sample conc. < 5x blank value:	Sample conc. > 5x blank value:
Flag sample result "JB"	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 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 waters? Calculate the RPD for all results and attach to this review. **Yes** [✓] No [ ] N/A [ ] Comments:

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

10.0 Application of Validation Qualifiers

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.

USEPA, 1988. "Laboratory Data Validation Functional Guidelines for Evaluating Organic and Inorganic Analysis," EPA/540/R-94-012 and EPA/540-R-94-013, July 1988.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance / Quality Control (QA / QC Requirements," BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance / Quality Control Guidelines for Sampling, Data Evaluation and reporting Activities, " BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

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: 2-14-13 Reviewer: Tige Cunningham

SDG 480-30106-1

☑ **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

OK reviewed

2. **Holding Time and Sample Preservation (30 days to digest, 7 days to analyze digestate)**

OK ✓

3. **QC Blanks**

Cr^{+6} = clean ✓

4. **Laboratory Control Sample Review (% recovery 80-120, RPD 20)**

Cr^{+6} = LCS Associated w/ soil samples in 480-30106-1 66%
J/UJ all soil results

5. **Field Duplicate Precision (RPD 50)**

Cr^{+6}: DUP-4 0.18J : OC-SB-514 15/17 0.88J RPD 32%

6. **Lab Duplicate Precision (RPD 35)**

ORP = OK ✓
pH = OK ✓

7. **Matrix Spike Results (if applicable) (% recovery 75-125, RPD 35)**

Cr^{+6} OC-SB-513-0.0/1.0-XXX MS = 56 MSD = 55 MSI = 56% pH = 7.30 ORP = 45
OC-SB-514-15/17-XXX MS = 69 MSD = 71 MSI = 74% pH = 6.85 ORP = 14
↳ Cr^{+6} detected @ 0.88mg/kg in sample J/UJ Cr^{+6} results

8. **Surrogate Recovery (if applicable)**

Not applicable.

9. **Internal Standard Recovery (if applicable)**

Not applicable.

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30106-1
SDG No.:
Client Sample ID: OC-SB-513-0.0/1.0-XXX
Lab Sample ID: 480-30106-1
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/12/2012 08:20
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.25(g)
Date Analyzed: 12/31/2012 13:52
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 13.1
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)	ND	UJ	0.23	0.17

2/15/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30106-1
SDG No.:
Client Sample ID: OC-SB-513-7.0/9.0-XXX
Lab Sample ID: 480-30106-2
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/12/2012 08:25
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.26(g)
Date Analyzed: 12/31/2012 14:43
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 14.7
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)	1.0	J	0.23	0.17

2/15/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30106-1
SDG No.:
Client Sample ID: OC-SB-513-10/12-XXX
Lab Sample ID: 480-30106-3
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/12/2012 08:30
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.26(g)
Date Analyzed: 12/31/2012 14:55
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 15.5
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)	0.47	J	0.23	0.18

2/15/12
TC

FORM I

HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine

Job No.: 480-30106-1

SDG No.:

Client Sample ID: OC-SB-514-0.0/1.0-XXX

Lab Sample ID: 480-30106-4

Matrix: Solid

Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199

Date Collected: 12/12/2012 08:50

Extraction Method: 3060A

Date Extracted: 12/27/2012 09:26

Sample wt/vol: 1.26(g)

Date Analyzed: 12/31/2012 15:08

Con. Extract Vol.: 50(mL)

Dilution Factor: 10

Injection Volume: 1(uL)

GC Column: AS7 ID: 4(mm)

% Moisture: 22.8

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)	0.54	J	0.26	0.19

2/15/13
TC

FORM I

HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine

Job No.: 480-30106-1

SDG No.:

Client Sample ID: OC-SB-514-15/17-XXX

Lab Sample ID: 480-30106-6

Matrix: Solid

Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199

Date Collected: 12/12/2012 09:20

Extraction Method: 3060A

Date Extracted: 12/27/2012 09:26

Sample wt/vol: 1.24(g)

Date Analyzed: 01/01/2013 17:03

Con. Extract Vol.: 50(mL)

Dilution Factor: 10

Injection Volume: 1(uL)

GC Column: AS7 ID: 4(mm)

% Moisture: 8.0

GPC Cleanup:(Y/N) N

Analysis Batch No.: 76481

Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.88	J	0.22	0.16

2/15/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30106-1
SDG No.:
Client Sample ID: OC-SB-517-0.0/1.0-XXX
Lab Sample ID: 480-30106-13
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/12/2012 12:15
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.25(g)
Date Analyzed: 01/01/2013 17:53
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 9.0
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76481
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	1.2	J	0.22	0.16

2/15/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30106-1
SDG No.:
Client Sample ID: OC-SB-517-6.0/8.0-XXX
Lab Sample ID: 480-30106-14
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/12/2012 12:20
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.25(g)
Date Analyzed: 01/01/2013 18:06
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 9.9
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76481
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.32	J	0.22	0.17

2/15/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30106-1
SDG No.:
Client Sample ID: OC-SB-517-18/20-XXX
Lab Sample ID: 480-30106-15
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/12/2012 12:40
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.24(g)
Date Analyzed: 01/01/2013 18:19
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 21.9
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76481
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	8.0	J	0.26	0.19

FORM I 7199

2/15/13
TC

FORM I

HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine

Job No.: 480-30106-1

SDG No.:

Client Sample ID: OC-SB-524-0.0/1.0-XXX

Lab Sample ID: 480-30106-16

Matrix: Solid

Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199

Date Collected: 12/12/2012 13:10

Extraction Method: 3060A

Date Extracted: 12/27/2012 09:26

Sample wt/vol: 1.24(g)

Date Analyzed: 01/01/2013 18:31

Con. Extract Vol.: 50(mL)

Dilution Factor: 10

Injection Volume: 1(uL)

GC Column: AS7 ID: 4(mm)

% Moisture: 16.7

GPC Cleanup:(Y/N) N

Analysis Batch No.: 76481

Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.31	J	0.24	0.18

2/15/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30106-1
SDG No.:
Client Sample ID: OC-SB-524-8.0/10-XXX
Lab Sample ID: 480-30106-17
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/12/2012 13:20
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.24(g)
Date Analyzed: 01/01/2013 18:44
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 16.6
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76481
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.34	J	0.24	0.18

2/15/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30106-1
SDG No.:
Client Sample ID: OC-SB-524-27/29-XXX
Lab Sample ID: 480-30106-18
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/12/2012 13:30
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.26(g)
Date Analyzed: 01/01/2013 18:57
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 21.6
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76481
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	ND	UJ	0.25	0.19

2/15/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30106-1
SDG No.:
Client Sample ID: OC-SB-523-0.0/1.0-XXX
Lab Sample ID: 480-30106-19
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/12/2012 13:45
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.24(g)
Date Analyzed: 01/01/2013 19:35
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 16.0
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76481
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.39	J	0.24	0.18

2/15/13
Tc

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30106-1
SDG No.:
Client Sample ID: OC-SB-523-22/24-XXX
Lab Sample ID: 480-30106-21
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/12/2012 14:10
Extraction Method: 3060A
Date Extracted: 12/27/2012 09:26
Sample wt/vol: 1.24(g)
Date Analyzed: 01/01/2013 20:00
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 10.4
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76481
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	1.1	J	0.23	0.17

2/15/13
Tc

FORM III
HPLC/IC LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-30106-1

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	

Column to be used to flag recovery and RPD values

FORM III 7199

2/14/13
TC

FORM III
HPLC/IC MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: 480-30106-1 MS Client ID: OC-SB-513-0.0/1.0-XXX MS

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	MS CONCENTRATION (mg/Kg)	MS % REC	QC LIMITS REC	#
Cr (VI)	18.6	ND	10.3	56	55-110	

Column to be used to flag recovery and RPD values

FORM III 7199

2/14/13
TC

FORM III
HPLC/IC MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: 480-30106-1 MSD Client ID: OC-SB-513-0.0/1.0-XXX MSD

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONCENTRATION (mg/Kg)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Cr (VI)	18.3	9.97	55	4	20	55-110	

Column to be used to flag recovery and RPD values

FORM III 7199

2/14/13
TC

FORM III
HPLC/IC MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: 480-30106-6 MS Client ID: OC-SB-514-15/17-XXX MS

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	MS CONCENTRATION (mg/Kg)	MS % REC	QC LIMITS REC	#
Cr (VI)	17.5	0.88	13.1	69	55-110	

Column to be used to flag recovery and RPD values

FORM III 7199

2/14/13
TC

FORM III
HPLC/IC MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: 480-30106-6 MSD Client ID: OC-SB-514-15/17-XXX MSD

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONCENTRATION (mg/Kg)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Cr (VI)	17.2	13.1	71	1	20	55-110	

Column to be used to flag recovery and RPD values

FORM III 7199

2/14/13
TC

FORM III
HPLC/IC MATRIX SPIKE INSOLUBLE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: 480-30106-1 MSI Client ID: OC-SB-513-0.0/1.0-XXX MSI

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	MSI CONCENTRATION (mg/Kg)	MSI % REC	QC LIMITS REC	#
Cr (VI)	2780	ND	1570	56	55-110	

Column to be used to flag recovery and RPD values

FORM III 7199

2/14/13
TC

FORM III
HPLC/IC MATRIX SPIKE INSOLUBLE RECOVERY

Lab Name: TestAmerica Irvine Job No.: 480-30106-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: Info 2_TAIIRV167_Hex

Lab ID: 480-30106-6 MSI Client ID: OC-SB-514-15/17-XXX MSI

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	MSI CONCENTRATION (mg/Kg)	MSI % REC	QC LIMITS REC	#
Cr (VI)	2250	0.88	1670	74	55-110	

Column to be used to flag recovery and RPD values

FORM III 7199

2/14/13
TC

TMP's only

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 #: 480-30197-1

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 (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%	244TMP-2 Linear Regression used ✓
☑	☐	☐	RRF greater than or equal to 0.05	
			Continuing Calibration	See Print pg 263
☐	☑	☐	%D less than or equal to 25%	(TC)
☑	☐	☐	RRF greater than or equal to 0.05.	244TMP-1 25.8% D UJ 520-0/1 520-8/10
			Blank Contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.
☐	☑	☐	Method blank contamination All ND	→ All TIC's were ND
☐	☐	☑	Trip blank contamination	→ Not Submitted
☐	☐	☑	Equipment/Rinseate blank contamination → 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)

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%)	} MS/MSD not requested in this SDG
Field Duplicates ☐ ☐ ☑ RPD criteria (water <30%, soils <50%) met	Not Collected w/ samples in 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	Siloxanes removed from data set as TIC's : common lab contaminants

Validator's Signature: [signature]

Date: 2/17/13

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 VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Buffalo Job No.: 480-30197-1

SDG No.:

Lab Sample ID: CCV 480-96032/4 Calibration Date: 12/16/2012 11:36

Instrument ID: HP5973F Calib Start Date: 12/11/2012 18:50

GC Column: ZB-624 (60) ID: 0.25(mm) Calib End Date: 12/11/2012 23:36

Lab File ID: F4353.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	0.3064	0.3123		51.0	50.0	1.9	20.0
3-Chloro-1-propene	Lin1		0.6687		56.6	50.0	13.1	20.0
2-Methyl-2-propanol	Ave	0.0719	0.0746		1040	1000	3.9	20.0
Halothane	Ave	0.2095	0.2412		57.6	50.0	15.1	20.0
Isopropyl ether	Ave	1.244	1.277		51.3	50.0	2.6	20.0
Tert-butyl ethyl ether	Ave	1.148	1.042		45.4	50.0	-9.2	20.0
Propionitrile	Ave	0.0741	0.0799		539	500	7.7	20.0
Tert-amyl methyl ether	Ave	1.011	0.9169		45.3	50.0	-9.3	20.0
n-Heptane	Ave	0.6203	0.6838		55.1	50.0	10.2	20.0
2,4,4-Trimethyl-1-pentene	Ave	0.3724	0.4685		62.9	50.0	25.8*	20.0
2,4,4-Trimethyl-2-pentene	Lin1		0.9302		57.6	50.0	15.2	20.0
1,4-Dioxane	Ave	0.0150	0.0171		2280	2000	13.9	20.0
2-Nitropropane	Ave	0.2659	0.2557		240	250	-3.9	20.0

FORM VII 8260C

TC
2/17/13

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 #: 480-30197-1

LAB #: TAL-BUF

Sample IDs: Attach tracking sheet and/or sample listing.

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	OK
			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)	OK
			Instrument Performance Check (Tune)	
☑	☐	☐	Tune available for each 12-hour period samples were analyzed	OK
☑	☐	☐	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%	OK
☑	☐	☐	RRF greater than or equal to 0.05	
			Continuing Calibration	
☑	☐	☐	%D less than or equal to 25%	OK
☑	☐	☐	RRF greater than or equal to 0.05.	
			Blank Contamination	
☐	☑	☐	Method blank contamination	Evaluate all blanks for contamination. Highest contaminant level used for action level.
☐	☐	☑	Equipment/Rinseate blank contamination	OK
			Surrogate Recoveries	

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)

☑	☐	☐	Surrogates percent recovery criteria met: Soil = (base/neutral 30%-130%, acid 30%-130%) Water = (base/neutral 30%-130%, acid 15%-110%)	OK
Matrix Spikes and Laboratory Control Samples				
☐	☐	☑	MS/MSD percent recovery criteria met Soil and Water = (base/neutral 40%-140%, acid 30%-130%)	MS-MSD - NA
☐	☐	☑	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
Field Duplicates				
☐	☐	☑	RPD criteria met (soils <50%, water <30%)	NA
Internal Standard				
☑	☐	☐	Area counts within -50 to +100 percent of calib. std.	OK
☑	☐	☐	Retention Time within 30 seconds of calib. std.	
Target Compounds				
☑	☐	☐	Reviewed narrative for anomalies	OK DILUTIONS = ELEVATED RL'S
Tentatively Identified Compounds (TICs)				
☐	☑	☐	TCL compounds reported as TICs	TICs REPORTED

Validator's Signature: [signature]

Date: 3/15/13

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: 480-30197-1

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 480-96302

Method: 8270D
Preparation: 3546

LCS Lab Sample ID:	LCS 480-96302/2-A	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Client Matrix:	Solid	Prep Batch:	480-96302	Lab File ID:	X3170.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	000030.5 g
Analysis Date:	12/19/2012 1738	Units:	ug/Kg	Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 480-96302/3-A	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Client Matrix:	Solid	Prep Batch:	480-96302	Lab File ID:	X3171.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 1804	Units:	ug/Kg	Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Bis(2-ethylhexyl) phthalate	86	99	40 - 140	15	30		
2,4,5-Trichlorophenol	92	95	30 - 130	4	30		
Aniline	49	66	40 - 140	29	30	J	
Hexachloroethane	70	81	40 - 140	15	30		
Dimethyl phthalate	76	81	40 - 140	8	30		
2,4-Dimethylphenol	63	99	30 - 130	45	30 LCS RPD		*
Isophorone	77	90	40 - 140	16	30		
Fluorene	71	83	40 - 140	17	30		
Dibenzofuran	76	88	40 - 140	15	30		
Acenaphthylene	76	93	40 - 140	22	30		
2,4-Dichlorophenol	76	85	30 - 130	12	30		
Benzo[g,h,i]perylene	96	102	40 - 140	7	30		
Hexachlorobenzene	87	102	40 - 140	17	30		
Di-n-octyl phthalate	77	87	40 - 140	13	30		
Hexachlorobutadiene	77	93	40 - 140	19	30		
Phenanthrene	82	85	40 - 140	5	30		
2-Nitrophenol	55	77	30 - 130	35	30 LCS RPD		*
Benzo[k]fluoranthene	79	90	40 - 140	14	30		
2,4-Dinitrophenol	11	0	30 - 130	200	30 LCS-L * LCS RPD		*
Anthracene	77	86	40 - 140	12	30		
2-Methylnaphthalene	80	91	40 - 140	13	30		
Di-n-butyl phthalate	84	92	40 - 140	10	30	J	J
1,2,4-Trichlorobenzene	77	81	40 - 140	6	30		
Pyrene	93	107	40 - 140	15	30		
2,4-Dinitrotoluene	66	63	40 - 140	3	30		
Dibenz(a,h)anthracene	83	97	40 - 140	16	30		
1,3-Dichlorobenzene	69	78	40 - 140	14	30		
Nitrobenzene	73	76	40 - 140	5	30		
Naphthalene	75	82	40 - 140	11	30		
2,4,6-Trichlorophenol	82	83	30 - 130	2	30		
Pentachlorophenol	86	91	30 - 130	7	30		
Fluoranthene	71	76	40 - 140	9	30		
3,3'-Dichlorobenzidine	45	58	40 - 140	25	30	J	J
4-Bromophenyl phenyl ether	82	92	40 - 140	12	30		
Diethyl phthalate	78	82	40 - 140	7	30		
2-Methylphenol	68	77	30 - 130	14	30		

Client: Olin Corporation

Job Number: 480-30197-1

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 480-96302

Method: 8270D
Preparation: 3546

LCS Lab Sample ID:	LCS 480-96302/2-A	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Client Matrix:	Solid	Prep Batch:	480-96302	Lab File ID:	X3170.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	000030.5 g
Analysis Date:	12/19/2012 1738	Units:	ug/Kg	Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 480-96302/3-A	Analysis Batch:	480-96568	Instrument ID:	HP5973X
Client Matrix:	Solid	Prep Batch:	480-96302	Lab File ID:	X3171.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	000030.2 g
Analysis Date:	12/19/2012 1804	Units:	ug/Kg	Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
1,2-Dichlorobenzene	67	80	40 - 140	18	30		
2,2'-oxybis[1-chloropropane]	71	81	40 - 140	13	30		
Bis(2-chloroethyl)ether	74	89	40 - 140	19	30		
Benzo[a]anthracene	76	82	40 - 140	9	30		
Indeno[1,2,3-cd]pyrene	88	101	40 - 140	15	30		
Butyl benzyl phthalate	82	96	40 - 140	16	30		
Chrysene	95	102	40 - 140	8	30		
Acenaphthene	75	78	40 - 140	5	30		
Benzo[b]fluoranthene	75	91	40 - 140	20	30		
4-Nitrophenol	0	0	30 - 130	NC	30	LCS-L *	*
4-Chloroaniline	37	52	40 - 140	33	30	LCS-L * LCS-RPD	J *
2-Chlorophenol	66	89	30 - 130	30	30		
2,6-Dinitrotoluene	31	33	40 - 140	9	30	LCS-L *	*
Phenol	71	85	30 - 130	20	30		
1,4-Dichlorobenzene	69	78	40 - 140	14	30		
Bis(2-chloroethoxy)methane	66	81	40 - 140	22	30		
2-Chloronaphthalene	48	57	40 - 140	18	30	J	
N-Nitrosodi-n-propylamine	69	73		6			
4-Chlorophenyl phenyl ether	73	82		13			
4-Chloro-3-methylphenol	80	92		15		J	J
Benzo[a]pyrene	78	85	40 - 140	9	30		
4-Methylphenol	74	110		40	LCS-RPD		
4-Nitroaniline	74	87		17		J	J
2-Nitroaniline	83	84		2		J	J
4,6-Dinitro-2-methylphenol	85	89		6		J	J
N-Nitrosodiphenylamine	37	39		4	LCS-L	J	J
Azobenzene	95	100	40 - 140	6	30		
Hexachlorocyclopentadiene	54	67		23		J	J
3-Nitroaniline	54	59		9		J	J
N-Nitrosodimethylamine	47	67		35	LCS-RPD	J	
Benzyl alcohol	3	0		200	LCS-L, LCS-RPD		
Benzoic acid	108	115		7		J	J

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
2,4,6-Tribromophenol	75	85	30 - 130
2-Fluorophenol	72	75	30 - 130

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-520-0.0/1.0-XXX**

Lab Sample ID: 480-30197-4
Client Matrix: Solid
% Moisture: 16.3

Date Sampled: 12/13/2012 0810
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3195.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1217			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		97	J	79	200
2,4,5-Trichlorophenol		ND		13	39
Aniline		ND		12	39
Hexachloroethane		ND		12	39
Dimethyl phthalate		ND		12	39
2,4-Dimethylphenol		ND J		12	39
Isophorone		ND		12	39
Fluorene		160		12	39
Dibenzofuran		130		12	39
Acenaphthylene		ND		12	39
2,4-Dichlorophenol		ND		12	39
Benzo[g,h,i]perylene		140		12	39
Hexachlorobenzene		ND		12	39
Di-n-octyl phthalate		ND		12	39
Hexachlorobutadiene		ND		12	39
Phenanthrene		1100	J ~~E~~	12	39
2-Nitrophenol		ND J		15	39
Benzo[k]fluoranthene		190		20	39
2,4-Dinitrophenol		~~ND~~ R		32	39
Anthracene		290		12	39
2-Methylnaphthalene		80		12	39
Di-n-butyl phthalate		ND		59	200
1,2,4-Trichlorobenzene		ND		12	39
Pyrene		690		12	39
2,4-Dinitrotoluene		ND		12	39
Dibenz(a,h)anthracene		ND		12	39
1,3-Dichlorobenzene		ND		12	39
Nitrobenzene		ND		12	39
Naphthalene		200		12	39
2,4,6-Trichlorophenol		ND		17	39
Pentachlorophenol		ND		12	39
Fluoranthene		860	J ~~E~~	12	39
3,3'-Dichlorobenzidine		ND		14	79
4-Bromophenyl phenyl ether		ND		12	39
Diethyl phthalate		ND		13	39
2-Methylphenol		ND		12	39
1,2-Dichlorobenzene		ND		12	39
2,2'-oxybis[1-chloropropane]		ND		12	39
Acetophenone		ND		12	39
Bis(2-chloroethyl)ether		ND		12	39
Benzo[a]anthracene		430		12	39
Indeno[1,2,3-cd]pyrene		130		12	39
Butyl benzyl phthalate		ND		12	39
Chrysene		340		12	39
Acenaphthene		100		12	39
Benzo[b]fluoranthene		460		12	39

3/15/13 BDG

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-520-0.0/1.0-XXX**

Lab Sample ID: 480-30197-4
Client Matrix: Solid
% Moisture: 16.3

Date Sampled: 12/13/2012 0810
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3195.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1217			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		~~ND~~ R		17	200
4-Chloroaniline		ND J		35	79
2-Chlorophenol		ND		12	39
2,6-Dinitrotoluene		ND J		33	39
Phenol		ND		12	39
3 & 4 Methylphenol		ND		12	39
1,4-Dichlorobenzene		ND		12	39
Bis(2-chloroethoxy)methane		ND		12	39
2-Chloronaphthalene		ND		12	39
N-Nitrosodi-n-propylamine		ND		12	39
4-Chlorophenyl phenyl ether		ND		12	39
4-Chloro-3-methylphenol		ND		12	79
Benzo[a]pyrene		360		12	39
4-Methylphenol		ND J		12	39
4-Nitroaniline		ND		33	200
2-Nitroaniline		ND		50	200
Caprolactam		ND		12	39
Carbazole		96		12	39
4,6-Dinitro-2-methylphenol		ND		38	200
1-Methylnaphthalene		55		12	39
N-Nitrosodiphenylamine		ND J		12	39
Atrazine		ND		12	39
Phenyl ether		ND		12	39
Benzaldehyde		13	J	12	39
Azobenzene		ND		12	39
Hexachlorocyclopentadiene		ND		12	79
3-Nitroaniline		ND		12	200
N-Nitrosodimethylamine		ND J		12	39
Benzyl alcohol		~~ND~~ R		12	79
1,1'-Biphenyl		24	J	12	39
2,3,4,6-Tetrachlorophenol		ND		12	39
Benzophenone		ND		12	39
Benzoic acid		ND		18	200
1,2,4,5-Tetrachlorobenzene		ND		12	39

3/15/13

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	89		30 - 130
2-Fluorophenol	59		30 - 130
Nitrobenzene-d5	70		30 - 130
Phenol-d5	56		30 - 130
2-Fluorobiphenyl	83		30 - 130
p-Terphenyl-d14	70		30 - 130

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-520-0.0/1.0-XXX**

Lab Sample ID: 480-30197-4
Client Matrix: Solid
% Moisture: 16.3

Date Sampled: 12/13/2012 0810
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3195.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1217			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~4.18~~	~~3900~~	~~T J~~
57-10-3	n-Hexadecanoic acid	13.77	340	T J N
~~7796-19-2~~	~~2-Heptacosanone~~	~~16.75~~	~~340~~	~~T J N~~
~~192-97-2~~	~~Benzo[e]pyrene~~	~~16.91~~	~~350~~	~~T J N~~
26603-23-6	p,p'-Dioctyldiphenylamine	16.99	1500	T J N
7225-64-1	Heptadecane, 9-octyl-	17.28	710	T J N
	Unknown	17.44	350	T J N
14021-23-9	D-Friedoolean-14-ene, 3-methoxy-, (3.bet	18.14	290	T J N
	Unknown	18.25	740	T J N
	Unknown	18.48	770	T J N

TC
3/18/13

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-520-8.0/10-XXX**

Lab Sample ID: 480-30197-5
Client Matrix: Solid
% Moisture: 6.1

Date Sampled: 12/13/2012 0840
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3196.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1243			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		70	180
2,4,5-Trichlorophenol		ND		12	35
Aniline		ND		11	35
Hexachloroethane		ND		11	35
Dimethyl phthalate		ND		11	35
2,4-Dimethylphenol		ND J		11	35
Isophorone		ND		11	35
Fluorene		ND		11	35
Dibenzofuran		ND		11	35
Acenaphthylene		ND		11	35
2,4-Dichlorophenol		ND		11	35
Benzo[g,h,i]perylene		ND		11	35
Hexachlorobenzene		ND		11	35
Di-n-octyl phthalate		ND		11	35
Hexachlorobutadiene		ND		11	35
Phenanthrene		ND		11	35
2-Nitrophenol		ND J		14	35
Benzo[k]fluoranthene		ND		18	35
2,4-Dinitrophenol		~~ND~~ R		28	35
Anthracene		ND		11	35
2-Methylnaphthalene		ND		11	35
Di-n-butyl phthalate		ND		53	180
1,2,4-Trichlorobenzene		ND		11	35
Pyrene		ND		11	35
2,4-Dinitrotoluene		ND		11	35
Dibenz(a,h)anthracene		ND		11	35
1,3-Dichlorobenzene		ND		11	35
Nitrobenzene		ND		11	35
Naphthalene		ND		11	35
2,4,6-Trichlorophenol		ND		15	35
Pentachlorophenol		ND		11	35
Fluoranthene		ND		11	35
3,3'-Dichlorobenzidine		ND		13	70
4-Bromophenyl phenyl ether		ND		11	35
Diethyl phthalate		ND		12	35
2-Methylphenol		ND		11	35
1,2-Dichlorobenzene		ND		11	35
2,2'-oxybis[1-chloropropane]		ND		11	35
Acetophenone		ND		11	35
Bis(2-chloroethyl)ether		ND		11	35
Benzo[a]anthracene		ND		11	35
Indeno[1,2,3-cd]pyrene		ND		11	35
Butyl benzyl phthalate		ND		11	35
Chrysene		ND		11	35
Acenaphthene		ND		11	35
Benzo[b]fluoranthene		ND		11	35

3/15/13 ABW

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-520-8.0/10-XXX**

Lab Sample ID: 480-30197-5
Client Matrix: Solid
% Moisture: 6.1

Date Sampled: 12/13/2012 0840
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3196.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1243			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		~~ND~~ R	~~*~~	15	180
4-Chloroaniline		ND J	~~*~~	32	70
2-Chlorophenol		ND		11	35
2,6-Dinitrotoluene		ND J	~~*~~	29	35
Phenol		ND		11	35
3 & 4 Methylphenol		ND		11	35
1,4-Dichlorobenzene		ND		11	35
Bis(2-chloroethoxy)methane		ND		11	35
2-Chloronaphthalene		ND		11	35
N-Nitrosodi-n-propylamine		ND		11	35
4-Chlorophenyl phenyl ether		ND		11	35
4-Chloro-3-methylphenol		ND		11	70
Benzo[a]pyrene		ND		11	35
4-Methylphenol		ND J		11	35
4-Nitroaniline		ND		29	180
2-Nitroaniline		ND		44	180
Caprolactam		ND		11	35
Carbazole		ND		11	35
4,6-Dinitro-2-methylphenol		ND		34	180
1-Methylnaphthalene		ND		11	35
N-Nitrosodiphenylamine		31 J	J	11	35
Atrazine		ND		11	35
Phenyl ether		43		11	35
Benzaldehyde		ND		11	35
Azobenzene		ND		11	35
Hexachlorocyclopentadiene		ND		11	70
3-Nitroaniline		ND		11	180
N-Nitrosodimethylamine		ND J		11	35
Benzyl alcohol		~~ND~~ R		11	70
1,1'-Biphenyl		ND		11	35
2,3,4,6-Tetrachlorophenol		ND		11	35
Benzophenone		ND		11	35
Benzoic acid		ND		16	180
1,2,4,5-Tetrachlorobenzene		ND		11	35

3/15/13

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	113		30 - 130
2-Fluorophenol	67		30 - 130
Nitrobenzene-d5	70		30 - 130
Phenol-d5	73		30 - 130
2-Fluorobiphenyl	84		30 - 130
p-Terphenyl-d14	93		30 - 130

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-520-8.0/10-XXX**

Lab Sample ID: 480-30197-5
Client Matrix: Solid
% Moisture: 6.1

Date Sampled: 12/13/2012 0840
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3196.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1243			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.84	39	T J N
	~~Unknown~~	~~4.20~~	~~4100~~	~~T J~~
	~~Unknown~~	~~4.22~~	~~40~~	~~T J~~
	Unknown	4.64	39	T J N
	Unknown	13.77	33	T J N
~~57684-12-5~~	~~3(4H)-Phenanthrenone, 4a,4b,5,6,7,8,8a,9~~	~~15.34~~	~~480~~	~~T J N~~
	Unknown	16.13	44	T J N
	Unknown	16.40	32	T J N
629-99-2	Pentacosane	16.67	58	T J N
	Unknown	16.97	54	T J N

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-520-18/20-XXX**

Lab Sample ID: 480-30197-6
Client Matrix: Solid
% Moisture: 7.4

Date Sampled: 12/13/2012 0850
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3197.D
Dilution:	1.0			Initial Weight/Volume:	000030.5 g
Analysis Date:	12/20/2012 1308			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		71	180
2,4,5-Trichlorophenol		ND		12	35
Aniline		ND		11	35
Hexachloroethane		ND		11	35
Dimethyl phthalate		ND		11	35
2,4-Dimethylphenol		ND J		11	35
Isophorone		ND		11	35
Fluorene		ND		11	35
Dibenzofuran		ND		11	35
Acenaphthylene		ND		11	35
2,4-Dichlorophenol		ND		11	35
Benzo[g,h,i]perylene		ND		11	35
Hexachlorobenzene		ND		11	35
Di-n-octyl phthalate		ND		11	35
Hexachlorobutadiene		ND		11	35
Phenanthrene		ND		11	35
2-Nitrophenol		ND J		14	35
Benzo[k]fluoranthene		ND		18	35
2,4-Dinitrophenol		~~ND~~ R		29	35
Anthracene		ND		11	35
2-Methylnaphthalene		ND		11	35
Di-n-butyl phthalate		ND		53	180
1,2,4-Trichlorobenzene		ND		11	35
Pyrene		ND		11	35
2,4-Dinitrotoluene		ND		11	35
Dibenz(a,h)anthracene		ND		11	35
1,3-Dichlorobenzene		ND		11	35
Nitrobenzene		ND		11	35
Naphthalene		ND		11	35
2,4,6-Trichlorophenol		ND		15	35
Pentachlorophenol		ND		11	35
Fluoranthene		ND		11	35
3,3'-Dichlorobenzidine		ND		13	71
4-Bromophenyl phenyl ether		ND		11	35
Diethyl phthalate		ND		12	35
2-Methylphenol		ND		11	35
1,2-Dichlorobenzene		ND		11	35
2,2'-oxybis[1-chloropropane]		ND		11	35
Acetophenone		ND		11	35
Bis(2-chloroethyl)ether		ND		11	35
Benzo[a]anthracene		ND		11	35
Indeno[1,2,3-cd]pyrene		ND		11	35
Butyl benzyl phthalate		ND		11	35
Chrysene		ND		11	35
Acenaphthene		ND		11	35
Benzo[b]fluoranthene		ND		11	35

3/15/13 [illegible]

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-520-18/20-XXX**

Lab Sample ID: 480-30197-6
Client Matrix: Solid
% Moisture: 7.4

Date Sampled: 12/13/2012 0850
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3197.D
Dilution:	1.0			Initial Weight/Volume:	000030.5 g
Analysis Date:	12/20/2012 1308			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		~~ND~~ R		15	180
4-Chloroaniline		ND J		32	71
2-Chlorophenol		ND		11	35
2,6-Dinitrotoluene		ND J		30	35
Phenol		ND		11	35
3 & 4 Methylphenol		ND		11	35
1,4-Dichlorobenzene		ND		11	35
Bis(2-chloroethoxy)methane		ND		11	35
2-Chloronaphthalene		ND		11	35
N-Nitrosodi-n-propylamine		ND		11	35
4-Chlorophenyl phenyl ether		ND		11	35
4-Chloro-3-methylphenol		ND		11	71
Benzo[a]pyrene		ND		11	35
4-Methylphenol		ND J		11	35
4-Nitroaniline		ND		30	180
2-Nitroaniline		ND		45	180
Caprolactam		ND		11	35
Carbazole		ND		11	35
4,6-Dinitro-2-methylphenol		ND		34	180
1-Methylnaphthalene		ND		11	35
N-Nitrosodiphenylamine		26 J	J	11	35
Atrazine		ND		11	35
Phenyl ether		ND		11	35
Benzaldehyde		ND		11	35
Azobenzene		ND		11	35
Hexachlorocyclopentadiene		ND		11	71
3-Nitroaniline		ND		11	180
N-Nitrosodimethylamine		ND J		11	35
Benzyl alcohol		~~ND~~ R		11	71
1,1'-Biphenyl		ND		11	35
2,3,4,6-Tetrachlorophenol		ND		11	35
Benzophenone		ND		11	35
Benzoic acid		ND		16	180
1,2,4,5-Tetrachlorobenzene		ND		11	35

3/15/13 BAW

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	95		30 - 130
2-Fluorophenol	76		30 - 130
Nitrobenzene-d5	91		30 - 130
Phenol-d5	80		30 - 130
2-Fluorobiphenyl	90		30 - 130
p-Terphenyl-d14	87		30 - 130

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-520-18/20-XXX**

Lab Sample ID: 480-30197-6
Client Matrix: Solid
% Moisture: 7.4

Date Sampled: 12/13/2012 0850
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3197.D
Dilution:	1.0			Initial Weight/Volume:	000030.5 g
Analysis Date:	12/20/2012 1308			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.85	49	~~T~~ J N
	~~Unknown~~	~~4.21~~	~~4100~~	~~T J~~
	~~Unknown~~	~~4.23~~	~~52~~	~~T J~~
~~95-47-6~~	~~Benzene, 1,2-dimethyl-~~	~~4.64~~	~~33~~	~~T J N~~
	Unknown	6.33	24	~~T~~ J N
~~122-39-4~~	~~Diphenylamine~~	~~12.13~~	~~26~~	J
629-94-7	Heneicosane	15.59	29	~~T~~ J N
	Unknown	16.13	27	~~T~~ J N
	Unknown	16.40	34	~~T~~ J N
	Unknown	16.97	26	~~T~~ J N

TC
3-15-13

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-522-0.0/1.0-XXX**

Lab Sample ID: 480-30197-7
Client Matrix: Solid
% Moisture: 19.2

Date Sampled: 12/13/2012 0920
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3198.D
Dilution:	1.0			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/20/2012 1334			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		150	J	81	200
2,4,5-Trichlorophenol		ND		13	40
Aniline		ND		12	40
Hexachloroethane		ND		12	40
Dimethyl phthalate		ND		12	40
2,4-Dimethylphenol		ND J		12	40
Isophorone		ND		12	40
Fluorene		ND		12	40
Dibenzofuran		ND		12	40
Acenaphthylene		ND		12	40
2,4-Dichlorophenol		ND		12	40
Benzo[g,h,i]perylene		34	J	12	40
Hexachlorobenzene		ND		12	40
Di-n-octyl phthalate		ND		12	40
Hexachlorobutadiene		ND		12	40
Phenanthrene		90		12	40
2-Nitrophenol		ND J		16	40
Benzo[k]fluoranthene		56		21	40
2,4-Dinitrophenol		~~ND~~ R		33	40
Anthracene		88		12	40
2-Methylnaphthalene		ND		12	40
Di-n-butyl phthalate		ND		61	200
1,2,4-Trichlorobenzene		ND		12	40
Pyrene		130		12	40
2,4-Dinitrotoluene		ND		12	40
Dibenz(a,h)anthracene		ND		12	40
1,3-Dichlorobenzene		ND		12	40
Nitrobenzene		ND		12	40
Naphthalene		ND		12	40
2,4,6-Trichlorophenol		ND		17	40
Pentachlorophenol		ND		12	40
Fluoranthene		180		12	40
3,3'-Dichlorobenzidine		ND		15	81
4-Bromophenyl phenyl ether		ND		12	40
Diethyl phthalate		ND		13	40
2-Methylphenol		ND		12	40
1,2-Dichlorobenzene		ND		12	40
2,2'-oxybis[1-chloropropane]		ND		12	40
Acetophenone		13	J	12	40
Bis(2-chloroethyl)ether		ND		12	40
Benzo[a]anthracene		75		12	40
Indeno[1,2,3-cd]pyrene		34	J	12	40
Butyl benzyl phthalate		ND		12	40
Chrysene		97		12	40
Acenaphthene		ND		12	40
Benzo[b]fluoranthene		140		12	40

3/15/13 BRW

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-522-0.0/1.0-XXX**

Lab Sample ID: 480-30197-7
Client Matrix: Solid
% Moisture: 19.2

Date Sampled: 12/13/2012 0920
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3198.D
Dilution:	1.0			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/20/2012 1334			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		~~ND~~ R		17	200
4-Chloroaniline		ND J		36	81
2-Chlorophenol		ND		12	40
2,6-Dinitrotoluene		ND J		34	40
Phenol		ND		12	40
3 & 4 Methylphenol		ND		12	40
1,4-Dichlorobenzene		ND		12	40
Bis(2-chloroethoxy)methane		ND		12	40
2-Chloronaphthalene		ND		12	40
N-Nitrosodi-n-propylamine		ND		12	40
4-Chlorophenyl phenyl ether		ND		12	40
4-Chloro-3-methylphenol		ND		12	81
Benzo[a]pyrene		82		12	40
4-Methylphenol		ND J		12	40
4-Nitroaniline		ND		34	200
2-Nitroaniline		ND		51	200
Caprolactam		ND		12	40
Carbazole		ND		12	40
4,6-Dinitro-2-methylphenol		ND		39	200
1-Methylnaphthalene		ND		12	40
N-Nitrosodiphenylamine		20 J	J	12	40
Atrazine		ND		12	40
Phenyl ether		ND		12	40
Benzaldehyde		120		12	40
Azobenzene		ND		12	40
Hexachlorocyclopentadiene		ND		12	81
3-Nitroaniline		ND		12	200
N-Nitrosodimethylamine		ND J		12	40
Benzyl alcohol		~~ND~~ R		12	81
1,1'-Biphenyl		ND		12	40
2,3,4,6-Tetrachlorophenol		ND		12	40
Benzophenone		ND		12	40
Benzoic acid		ND		18	200
1,2,4,5-Tetrachlorobenzene		ND		12	40

3/15/13 BAB

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	94		30 - 130
2-Fluorophenol	71		30 - 130
Nitrobenzene-d5	70		30 - 130
Phenol-d5	66		30 - 130
2-Fluorobiphenyl	87		30 - 130
p-Terphenyl-d14	71		30 - 130

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-522-0.0/1.0-XXX**

Lab Sample ID: 480-30197-7
Client Matrix: Solid
% Moisture: 19.2

Date Sampled: 12/13/2012 0920
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3198.D
Dilution:	1.0			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/20/2012 1334			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~4.19~~	~~4100~~	~~T J~~
	Unknown	15.04	110	~~T~~ J N
629-94-7	Heneicosane	15.59	97	~~T~~ J N
6561-44-0	Octadecane, 3-methyl-	16.13	290	~~T~~ J N
630-1-3	Hexacosane	17.28	140	~~T~~ J N
638-66-4	Octadecanal	17.83	250	~~T~~ J N
	Unknown	18.48	700	~~T~~ J N
	Unknown	18.57	920	~~T~~ J N
	Unknown	18.61	290	~~T~~ J N
22611-26-3	D:C-Friedoolean-8-en-3-one	18.80	3200	~~T~~ J N

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-522-8.0/10-XXX**

Lab Sample ID: 480-30197-8
Client Matrix: Solid
% Moisture: 18.1

Date Sampled: 12/13/2012 0940
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3223.D
Dilution:	100			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/21/2012 1038			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		29000		8200	20000
2,4,5-Trichlorophenol		ND		1300	4100
Aniline		ND		1200	4100
Hexachloroethane		ND		1200	4100
Dimethyl phthalate		ND		1200	4100
2,4-Dimethylphenol		ND J		1200	4100
Isophorone		ND		1200	4100
Fluorene		ND		1200	4100
Dibenzofuran		ND		1200	4100
Acenaphthylene		ND		1200	4100
2,4-Dichlorophenol		ND		1200	4100
Benzo[g,h,i]perylene		ND		1200	4100
Hexachlorobenzene		ND		1200	4100
Di-n-octyl phthalate		ND		1200	4100
Hexachlorobutadiene		ND		1200	4100
Phenanthrene		ND		1200	4100
2-Nitrophenol		ND J		1600	4100
Benzo[k]fluoranthene		ND		2100	4100
2,4-Dinitrophenol		~~ND~~ R		3300	4100
Anthracene		ND		1200	4100
2-Methylnaphthalene		ND		1200	4100
Di-n-butyl phthalate		ND		6100	20000
1,2,4-Trichlorobenzene		ND		1200	4100
Pyrene		ND		1200	4100
2,4-Dinitrotoluene		ND		1200	4100
Dibenz(a,h)anthracene		ND		1200	4100
1,3-Dichlorobenzene		ND		1200	4100
Nitrobenzene		ND		1200	4100
Naphthalene		ND		1200	4100
2,4,6-Trichlorophenol		ND		1700	4100
Pentachlorophenol		ND		1200	4100
Fluoranthene		ND		1200	4100
3,3'-Dichlorobenzidine		ND		1500	8100
4-Bromophenyl phenyl ether		ND		1200	4100
Diethyl phthalate		ND		1300	4100
2-Methylphenol		ND		1200	4100
1,2-Dichlorobenzene		ND		1200	4100
2,2'-oxybis[1-chloropropane]		ND		1200	4100
Acetophenone		ND		1200	4100
Bis(2-chloroethyl)ether		ND		1200	4100
Benzo[a]anthracene		ND		1200	4100
Indeno[1,2,3-cd]pyrene		ND		1200	4100
Butyl benzyl phthalate		ND		1200	4100
Chrysene		ND		1200	4100
Acenaphthene		ND		1200	4100
Benzo[b]fluoranthene		ND		1200	4100

3/15/13 BALN

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-522-8.0/10-XXX**

Lab Sample ID: 480-30197-8
Client Matrix: Solid
% Moisture: 18.1

Date Sampled: 12/13/2012 0940
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3223.D
Dilution:	100			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/21/2012 1038			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		~~ND~~ R	~~*~~	1700	20000
4-Chloroaniline		ND J	~~*~~	3700	8100
2-Chlorophenol		ND		1200	4100
2,6-Dinitrotoluene		ND J	~~*~~	3400	4100
Phenol		ND		1200	4100
3 & 4 Methylphenol		ND		1200	4100
1,4-Dichlorobenzene		ND		1200	4100
Bis(2-chloroethoxy)methane		ND		1200	4100
2-Chloronaphthalene		ND		1200	4100
N-Nitrosodi-n-propylamine		ND		1200	4100
4-Chlorophenyl phenyl ether		ND		1200	4100
4-Chloro-3-methylphenol		ND		1200	8100
Benzo[a]pyrene		ND		1200	4100
4-Methylphenol		ND J		1200	4100
4-Nitroaniline		ND		3400	20000
2-Nitroaniline		ND		5100	20000
Caprolactam		ND		1200	4100
Carbazole		ND		1200	4100
4,6-Dinitro-2-methylphenol		ND		3900	20000
1-Methylnaphthalene		ND		1200	4100
N-Nitrosodiphenylamine		ND J		1200	4100
Atrazine		ND		1200	4100
Phenyl ether		ND		1200	4100
Benzaldehyde		ND		1200	4100
Azobenzene		ND		1200	4100
Hexachlorocyclopentadiene		ND		1200	8100
3-Nitroaniline		ND		1200	20000
N-Nitrosodimethylamine		ND J		1200	4100
Benzyl alcohol		~~ND~~ R		1200	8100
1,1'-Biphenyl		ND		1200	4100
2,3,4,6-Tetrachlorophenol		ND		1200	4100
Benzophenone		ND		1200	4100
Benzoic acid		ND		1800	20000
1,2,4,5-Tetrachlorobenzene		ND		1200	4100

3/15/13 BMS

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

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-522-8.0/10-XXX**

Lab Sample ID: 480-30197-8
Client Matrix: Solid
% Moisture: 18.1

Date Sampled: 12/13/2012 0940
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-97046	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3223.D
Dilution:	100			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/21/2012 1038			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 4

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
~~75-9-2~~	~~Methylene Chloride~~	~~3.38~~	~~390000~~	~~T J N~~
	~~Unknown~~	~~4.19~~	~~5300~~	~~T J~~
	Unknown	15.06	4100	T J
	Unknown	17.00	15000	T J

TC
3/15/13

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-522-13/15-XXX**

Lab Sample ID: 480-30197-9
Client Matrix: Solid
% Moisture: 18.2

Date Sampled: 12/13/2012 0950
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3200.D
Dilution:	1.0			Initial Weight/Volume:	000030.7 g
Analysis Date:	12/20/2012 1426			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		80	200
2,4,5-Trichlorophenol		ND		13	40
Aniline		ND		12	40
Hexachloroethane		ND		12	40
Dimethyl phthalate		ND		12	40
2,4-Dimethylphenol		ND J		12	40
Isophorone		ND		12	40
Fluorene		ND		12	40
Dibenzofuran		ND		12	40
Acenaphthylene		ND		12	40
2,4-Dichlorophenol		ND		12	40
Benzo[g,h,i]perylene		ND		12	40
Hexachlorobenzene		ND		12	40
Di-n-octyl phthalate		ND		12	40
Hexachlorobutadiene		ND		12	40
Phenanthrene		ND		12	40
2-Nitrophenol		ND J		16	40
Benzo[k]fluoranthene		ND		20	40
2,4-Dinitrophenol		~~ND~~ R		32	40
Anthracene		ND		12	40
2-Methylnaphthalene		ND		12	40
Di-n-butyl phthalate		ND		60	200
1,2,4-Trichlorobenzene		ND		12	40
Pyrene		ND		12	40
2,4-Dinitrotoluene		ND		12	40
Dibenz(a,h)anthracene		ND		12	40
1,3-Dichlorobenzene		ND		12	40
Nitrobenzene		ND		12	40
Naphthalene		ND		12	40
2,4,6-Trichlorophenol		ND		17	40
Pentachlorophenol		ND		12	40
Fluoranthene		ND		12	40
3,3'-Dichlorobenzidine		ND		14	80
4-Bromophenyl phenyl ether		ND		12	40
Diethyl phthalate		ND		13	40
2-Methylphenol		ND		12	40
1,2-Dichlorobenzene		ND		12	40
2,2'-oxybis[1-chloropropane]		ND		12	40
Acetophenone		ND		12	40
Bis(2-chloroethyl)ether		ND		12	40
Benzo[a]anthracene		ND		12	40
Indeno[1,2,3-cd]pyrene		ND		12	40
Butyl benzyl phthalate		ND		12	40
Chrysene		ND		12	40
Acenaphthene		ND		12	40
Benzo[b]fluoranthene		ND		12	40

3/15/13 BGW

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-522-13/15-XXX**

Lab Sample ID: 480-30197-9
Client Matrix: Solid
% Moisture: 18.2

Date Sampled: 12/13/2012 0950
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3200.D
Dilution:	1.0			Initial Weight/Volume:	000030.7 g
Analysis Date:	12/20/2012 1426			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		~~ND~~ R	~~*~~	17	200
4-Chloroaniline		ND J	~~*~~	36	80
2-Chlorophenol		ND		12	40
2,6-Dinitrotoluene		ND J	~~*~~	33	40
Phenol		ND		12	40
3 & 4 Methylphenol		ND		12	40
1,4-Dichlorobenzene		ND		12	40
Bis(2-chloroethoxy)methane		ND		12	40
2-Chloronaphthalene		ND		12	40
N-Nitrosodi-n-propylamine		ND		12	40
4-Chlorophenyl phenyl ether		ND		12	40
4-Chloro-3-methylphenol		ND		12	80
Benzo[a]pyrene		ND		12	40
4-Methylphenol		ND J		12	40
4-Nitroaniline		ND		33	200
2-Nitroaniline		ND		50	200
Caprolactam		ND		12	40
Carbazole		ND		12	40
4,6-Dinitro-2-methylphenol		ND		38	200
1-Methylnaphthalene		ND		12	40
N-Nitrosodiphenylamine		ND J		12	40
Atrazine		ND		12	40
Phenyl ether		ND		12	40
Benzaldehyde		ND		12	40
Azobenzene		ND		12	40
Hexachlorocyclopentadiene		ND		12	80
3-Nitroaniline		ND		12	200
N-Nitrosodimethylamine		ND J		12	40
Benzyl alcohol		~~ND~~ R		12	80
1,1'-Biphenyl		ND		12	40
2,3,4,6-Tetrachlorophenol		ND		12	40
Benzophenone		ND		12	40
Benzoic acid		ND		18	200
1,2,4,5-Tetrachlorobenzene		ND		12	40

3/15/13 BBW

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	43		30 - 130
2-Fluorophenol	81		30 - 130
Nitrobenzene-d5	80		30 - 130
Phenol-d5	66		30 - 130
2-Fluorobiphenyl	82		30 - 130
p-Terphenyl-d14	71		30 - 130

Client: Olin Corporation

Job Number: 480-30197-1

Client Sample ID: **OC-SB-522-13/15-XXX**

Lab Sample ID: 480-30197-9
Client Matrix: Solid
% Moisture: 18.2

Date Sampled: 12/13/2012 0950
Date Received: 12/14/2012 1830

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96302	Lab File ID:	X3200.D
Dilution:	1.0			Initial Weight/Volume:	000030.7 g
Analysis Date:	12/20/2012 1426			Final Weight/Volume:	1 mL
Prep Date:	12/18/2012 0812			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	3.83	38	~~T~~ J N
	~~Unknown~~	~~4.18~~	~~4200~~	~~T J~~
	~~Unknown~~	~~4.20~~	~~32~~	~~T J~~
2175-91-9	1,3-Cyclopentadiene, 5-(1-methylethylide	4.63	52	~~T~~ J N
	Unknown	7.47	34	~~T~~ J N
	Unknown	15.87	27	~~T~~ J N
629-94-7	Heneicosane	16.40	30	~~T~~ J N
593-45-3	Octadecane	16.68	26	~~T~~ J N
	Unknown	16.97	43	~~T~~ J N
	Unknown	17.28	31	~~T~~ J N

TC
3/21/13

Version 1.1, April 2002

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
EXTRACTABLE PETROLEUM HYDROCARBONS BY METHOD MADEP-EPH-98-1

Reviewer/Date Tige Cunningham 2/17/13
Sr. Review/Date
Lab Report # 480-30197-1
LAW Project # 6107130016-10

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* ☑ *Certification ID #* ☑ *Address* ☑ *Project ID* ☑ *Phone #* ☑ *Sample identification – Field and Laboratory*
Client Information: ☑ *Name* ☑ *Address* ☑ *Phone #* ☑ *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: *Are both of the following statements true?* ***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) **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include the *original* 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 missing original 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 ☑ Custody seals checked ☑ 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:

Water - 1 Liter amber bottle / 5 ml 1:1 HCl, cool to 4°C
Soil - 4 oz amber soil jar w/ Teflon lined cap / 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

ACTION: If each VOA vial for a sample contains air bubbles or the VOA vial analyzed contained air bubbles, flag positives (J) and reject nondetects (R).

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)

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 N/A ☐ MS/MSD recoveries and RPDs N/A ☐ Laboratory duplicate results (where applicable) ☑ 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? For water samples, the holding time is 14 days from sampling to extraction and 40 days from extraction to analysis. For soil samples, the holding time is 7 days from sampling to extraction and 40 days from extraction to analysis.

NOTE: List samples that exceeded hold time with number of days exceeded on checklist.

ACTION: If technical holding times are exceeded, qualify all positive results (J) and reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? **Yes** [✓] No [ ] N/A [ ] Comments:

Extractable Petroleum Hydrocarbons MADEP-EPH-98-1

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 **Yes** [✓] No [ ] N/A [ ] Comments:

☐ SOW ☑ QAPP ☐ Lab?

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 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 Was a method blank analyzed for each analysis batch of EPH 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 attached table for PQLs) Yes [ ] **No** [✓] N/A [ ] Comments: No detections in MB

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

If the sample concentration is < 5 × blank value, flag sample result "JB"

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 Standard

5.1 Was a laboratory control standard 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, reject (R) data 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 of 40-140%? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: *A second source LCS containing at least five target analytes from each fraction is required by MADEP.*

NOTE: *MADEP guidelines list LCS recovery limits as 40-140 for all analytes except C36. The laboratory must identify analytes that routinely exceed these limits. See the attached table for a listing of MADEP LCS control limits vs. the control limits listed in the QAPP.*

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%, positive and non-detect results are rejected (R) unless the QC limit for that compound is below 10% (flag as above).

5.4 Are 80% of LCS recoveries within laboratory control limits? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If 80% of LCS recoveries are not within limits, use professional judgment and consult Senior Chemist. If more than half of the recoveries are above control limits, qualify all positive results as (J). If more than half of the recoveries are below control limits, batch may require rejection and reanalysis

6.0 Matrix Spikes

6.1 Were project-specific MS/MSDs collected? 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?

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

Yes [ ] No [ ] N/A [✓] Comments:

6.4 Are any EPH 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: *A second source MS/MSD containing at least five target analytes from each fraction is required by MADEP.*

NOTE: *MADEP guidelines list MS/MSD recovery limits as 40-140 for all analytes except C36. The laboratory must identify analytes that routinely exceed these limits. See the attached table for a listing of MADEP LCS control limits vs. the control limits listed in the QAPP*

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.

NOTE: 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.

ACTION: MS/MSD flags only apply to the sample spiked. 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).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits of ≤ *50 for soil and ≤ 30 for water*? 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: *MADEP guidelines list MS/MSD RPD limits for water and soil as ≤ 50. See the attached table for a listing of MADEP MS/MSD RPD limits vs. the control limits listed in the QAPP.*

NOTE: 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 are evaluated, but no flags are applied.

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

7.0 Surrogate Recoveries

Were one or more EPH surrogate recoveries outside of laboratory limits for any sample or method blank? If yes, were samples re-analyzed? Yes [ ] **No** [✓] N/A [ ] Comments:

NOTE: %R = QD x 100% Where: S = MS sample result
D = MSD sample result

NOTE: *MADEP guidelines require at least two extraction and two fractionation surrogates, and lists recovery limits as 40-140% for all surrogates. See the attached table for a listing of MADEP surrogate limits vs. the control limits listed in the QAPP*

NOTE: If surrogate recoveries fail due to dilution, results are not flagged. Document on checklist and in the case narrative.

ACTION: If recoveries are >10%, but fail to meet QC criteria: (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 QC limits are below 10%, in which case, results are flagged as stated above), flag positives (J) and reject nondetects (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:

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

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

ACTION: Evaluate rinsate results against other blank results to determine if contaminant may be laboratory-, ambient, or shipment-derived. If results are not lab-, ambient, or shipment related, qualify according to the table below.

Sample conc. < 5x blank value:	Sample conc. > 5x blank value:
Flag sample result "JB"	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 Were field duplicates collected per the required frequency? **Yes** [✓] No [ ] N/A [ ] Comments: Reported in other SDG's

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

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

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

10.0 Application of Validation Qualifiers

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.

USEPA, 1988. "Laboratory Data Validation Functional Guidelines for Evaluating Organic and Inorganic Analysis," EPA/540/R-94-012 and EPA/540-R-94-013, July 1988.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance / Quality Control (QA / QC Requirements," BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance / Quality Control Guidelines for Sampling, Data Evaluation and reporting Activities, " BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

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: 2-17-13 Reviewer: Tige Cunningham

SDG #480-30197-1

☑ **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

OK

2. **Holding Time and Sample Preservation (30 days to digest, 7 days to analyze digestate)**

OK

3. **QC Blanks**

Cr^{+6} = ND

4. **Laboratory Control Sample Review (% recovery 80-120, RPD 20)**

* Cr^{+6} LCS @ 75% : J/UJ All soil results

pH = OK

5. **Field Duplicate Precision (RPD 50)**

Not collected w/ samples in this SDG

6. **Lab Duplicate Precision (RPD 35)**

pH = OK

Cr^{+6} = N/A

7. **Matrix Spike Results (if applicable) (% recovery 75-125, RPD 35)**

No matrix spike requested

8. **Surrogate Recovery (if applicable)**

Not applicable.

9. **Internal Standard Recovery (if applicable)**

Not applicable.

Method: MA-EPH - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 480-96085/3-D — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 97357 — **Prep Batch: 96085**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pyrene	4.59	4.06		mg/Kg		89	40 - 140	0	25
C11-C22 Aromatics	78.0	66.4		mg/Kg		85	40 - 140	1	25
C19-C36 Aliphatics	36.7	26.0		mg/Kg		71	40 - 140	4	25
C9-C18 Aliphatics	27.5	17.8		mg/Kg		65	40 - 140	3	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1-Chlorooctadecane	*58*		*40 - 140*
2-Bromonaphthalene	*108*		*40 - 140*
2-Fluorobiphenyl	*110*		*40 - 140*
o-Terphenyl	*88*		*40 - 140*

Method: 7199 - Chromium, Hexavalent (IC)

Lab Sample ID: MB 440-76769/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 76762 — **Prep Batch: 76769**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.20	0.15	mg/Kg		01/03/13 09:01	01/03/13 23:06	10

Lab Sample ID: LCS 440-76769/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 76762 — **Prep Batch: 76769**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	15.9	11.9		mg/Kg		75	65 - 110

Method: 9045C - pH

Lab Sample ID: LCS 360-97402/1-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 97404

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	6.00	5.940		SU		99	90 - 110

Lab Sample ID: 480-30197-12 DU — **Client Sample ID: OC-SB-525-18/20-XXX**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 97404

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.21		7.200		SU		0.1	10.0

TC 2/16/13

TestAmerica Buffalo

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine | Job No.: 480-30197-1

SDG No.:

Client Sample ID: OC-SB-509-1.0/3.0-XXX | Lab Sample ID: 480-30197-1

Matrix: Solid | Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199 | Date Collected: 12/13/2012 13:35

Extraction Method: 3060A | Date Extracted: 01/03/2013 09:01

Sample wt/vol: 1.2540(g) | Date Analyzed: 01/04/2013 02:41

Con. Extract Vol.: 50(mL) | Dilution Factor: 1000

Injection Volume: 1(uL) | GC Column: AS7 ID: 4(mm)

% Moisture: 20.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 76762 | Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	28	J	25	19

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30197-1
SDG No.:
Client Sample ID: OC-SB-510-0.0/1.0-XXX
Lab Sample ID: 480-30197-2
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/13/2012 12:55
Extraction Method: 3060A
Date Extracted: 01/03/2013 09:01
Sample wt/vol: 1.2549(g)
Date Analyzed: 01/04/2013 02:54
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7
ID: 4(mm)
% Moisture: 7.9
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76762
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	10	J	0.22	0.16

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30197-1
SDG No.:
Client Sample ID: OC-SB-510-7.0/9.0-XXX
Lab Sample ID: 480-30197-3
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/13/2012 13:00
Extraction Method: 3060A
Date Extracted: 01/03/2013 09:01
Sample wt/vol: 1.2561(g)
Date Analyzed: 01/04/2013 03:07
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 14.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76762
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	6.0	J	0.23	0.17

2/18/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30197-1
SDG No.:
Client Sample ID: OC-SB-522-0.0/1.0-XXX
Lab Sample ID: 480-30197-7
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/13/2012 09:20
Extraction Method: 3060A
Date Extracted: 01/03/2013 09:01
Sample wt/vol: 1.2537(g)
Date Analyzed: 01/04/2013 03:19
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 19.2
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76762
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	ND	UJ	0.25	0.19

2/18/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30197-1
SDG No.:
Client Sample ID: OC-SB-522-8.0/10-XXX
Lab Sample ID: 480-30197-8
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/13/2012 09:40
Extraction Method: 3060A
Date Extracted: 01/03/2013 09:01
Sample wt/vol: 1.2556(g)
Date Analyzed: 01/04/2013 03:32
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 18.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76762
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	1.6	J	0.24	0.18

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine | Job No.: 480-30197-1

SDG No.:

Client Sample ID: OC-SB-525-0.0/1.0-XXX | Lab Sample ID: 480-30197-10

Matrix: Solid | Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199 | Date Collected: 12/13/2012 11:00

Extraction Method: 3060A | Date Extracted: 01/03/2013 09:01

Sample wt/vol: 1.2520(g) | Date Analyzed: 01/04/2013 04:23

Con. Extract Vol.: 50(mL) | Dilution Factor: 10

Injection Volume: 1(uL) | GC Column: AS7 ID: 4(mm)

% Moisture: 10.1 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 76762 | Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.52	J	0.22	0.17

2/18/2013
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30197-1
SDG No.:
Client Sample ID: OC-SB-525-3.0/5.0-XXX
Lab Sample ID: 480-30197-11
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/13/2012 11:20
Extraction Method: 3060A
Date Extracted: 01/03/2013 09:15
Sample wt/vol: 1.2568(g)
Date Analyzed: 01/04/2013 04:35
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 16.2
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76762
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	ND	UJ	0.24	0.18

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30197-1
SDG No.:
Client Sample ID: OC-SB-525-18/20-XXX
Lab Sample ID: 480-30197-12
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/13/2012 11:45
Extraction Method: 3060A
Date Extracted: 01/03/2013 09:15
Sample wt/vol: 1.2532(g)
Date Analyzed: 01/04/2013 04:48
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 8.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76762
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	9.7	J	0.22	0.16

TC
2/18/13

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 #: 480-30346-1

LAB #: TRL-BUF

Sample IDs: Attach tracking sheet and/or sample listing.

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	OK
			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)	OK
			Instrument Performance Check (Tune)	
☑	☐	☐	Tune available for each 12-hour period samples were analyzed	
☑	☐	☐	Appropriate number of significant figures reported (at least 2)	OK
☑	☐	☐	Mass/Charge list (m/z) criteria met	
			Initial Calibration	
☑	☐	☐	%RSD less than or equal to 30%	
☑	☐	☐	RRF greater than or equal to 0.05	OK
			Continuing Calibration	OK
☑	☐	☐	%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	
☐	☐	☑	Equipment/Rinseate blank contamination	OK
			Surrogate Recoveries	

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)

☑	☐	☐	Surrogates percent recovery criteria met: Soil = (base/neutral 30%-130%, acid 30%-130%) Water = (base/neutral 30%-130%, acid 15%-110%)	OK
Matrix Spikes and Laboratory Control Samples				
☐	☐	☑	MS/MSD percent recovery criteria met Soil and Water = (base/neutral 40%-140%, acid 30%-130%)	MS-MSD - NA
☐	☐	☑	MS/MSD RPD criteria met (soils <50%, water <30%)	LCS - 2,4-D INITROPHENOL >30% RDP (74)
☐	☑	☐	LCS percent recovery criteria met soil/water (base 40%-140%, acid 30%-130%)	LCSD - 14% REC FOR 4-NITROPHENOL QC LIMIT 30 RPD >30% (147) UJ BOTH IN ALL LCS-L LCSRPD
Field Duplicates				
☐	☐	☑	RPD criteria met (soils <50%, water <30%)	NA
Internal Standard				
☑	☑	☐	Area counts within -50 to +100 percent of calib. std.	PERYLENE-D10 - LOW LAB ID #5 PHENANTHRENE-D10 LOW LAB ID #: 5,6,8
☑	☐	☐	Retention Time within 30 seconds of calib. std.	J/UJ IS-L
Target Compounds				
☑	☐	☐	Reviewed narrative for anomalies	OK DILUTIONS = ELEVATED RLS
Tentatively Identified Compounds (TICs)				
☐	☑	☐	TCL compounds reported as TICs	TIC REPORTED OK

Validator's Signature: [signature]

Date: 3/15/13

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: 480-30346-1

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 480-96561

Method: 8270D
Preparation: 3546

LCS Lab Sample ID:	LCS 480-96561/2-A	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Client Matrix:	Solid	Prep Batch:	480-96561	Lab File ID:	X3203.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	000030.2 g
Analysis Date:	12/20/2012 1542	Units:	ug/Kg	Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 480-96561/3-A	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Client Matrix:	Solid	Prep Batch:	480-96561	Lab File ID:	X3204.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	000030.2 g
Analysis Date:	12/20/2012 1608	Units:	ug/Kg	Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Bis(2-ethylhexyl) phthalate	87	96	40 - 140	9	30		
2,4,5-Trichlorophenol	93	96	30 - 130	3	30		
Aniline	77	81	40 - 140	5	30		
Hexachloroethane	79	81	40 - 140	3	30		
Dimethyl phthalate	90	96	40 - 140	7	30		
2,4-Dimethylphenol	91	94	30 - 130	3	30		
Isophorone	85	91	40 - 140	7	30		
Fluorene	85	89	40 - 140	4	30		
Dibenzofuran	95	97	40 - 140	1	30		
Acenaphthylene	93	96	40 - 140	3	30		
2,4-Dichlorophenol	86	93	30 - 130	8	30		
Benzo[g,h,i]perylene	60	58	40 - 140	4	30		
Hexachlorobenzene	97	96	40 - 140	1	30		
Di-n-octyl phthalate	108	113	40 - 140	4	30		
Hexachlorobutadiene	77	82	40 - 140	7	30		
Phenanthrene	95	96	40 - 140	1	30		
2-Nitrophenol	88	90	30 - 130	3	30		
Benzo[k]fluoranthene	112	114	40 - 140	2	30		
2,4-Dinitrophenol	95	44	30 - 130	74	30	LCS RPD	* UJ All
Anthracene	96	98	40 - 140	2	30		
2-Methylnaphthalene	77	82	40 - 140	7	30		
Di-n-butyl phthalate	103	105	40 - 140	1	30		
1,2,4-Trichlorobenzene	79	84	40 - 140	6	30		
Pyrene	83	90	40 - 140	9	30		
2,4-Dinitrotoluene	89	91	40 - 140	3	30		
Dibenz(a,h)anthracene	63	65	40 - 140	3	30		
1,3-Dichlorobenzene	74	77	40 - 140	4	30		
Nitrobenzene	88	88	40 - 140	0	30		
Naphthalene	80	82	40 - 140	3	30		
2,4,6-Trichlorophenol	96	103	30 - 130	7	30		
Pentachlorophenol	88	98	30 - 130	11	30		
Fluoranthene	79	77	40 - 140	2	30		
3,3'-Dichlorobenzidine	85	91	40 - 140	7	30		
4-Bromophenyl phenyl ether	100	105	40 - 140	4	30		
Diethyl phthalate	90	95	40 - 140	5	30		
2-Methylphenol	98	90	30 - 130	9	30		

Client: Olin Corporation

Job Number: 480-30346-1

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 480-96561

Method: 8270D
Preparation: 3546

LCS Lab Sample ID:	LCS 480-96561/2-A	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Client Matrix:	Solid	Prep Batch:	480-96561	Lab File ID:	X3203.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	000030.2 g
Analysis Date:	12/20/2012 1542	Units:	ug/Kg	Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 480-96561/3-A	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Client Matrix:	Solid	Prep Batch:	480-96561	Lab File ID:	X3204.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	000030.2 g
Analysis Date:	12/20/2012 1608	Units:	ug/Kg	Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
1,2-Dichlorobenzene	77	80	40 - 140	4	30		
2,2'-oxybis[1-chloropropane]	73	79	40 - 140	7	30		
Acetophenone	95	102	40 - 140	7	30		
Bis(2-chloroethyl)ether	83	85	40 - 140	3	30		
Benzo[a]anthracene	105	105	40 - 140	0	30		
Indeno[1,2,3-cd]pyrene	60	61	40 - 140	2	30		
Butyl benzyl phthalate	84	92	40 - 140	8	30		
Chrysene	89	98	40 - 140	10	30		
Acenaphthene	81	85	40 - 140	4	30		
Benzo[b]fluoranthene	94	101	40 - 140	7	30		
4-Nitrophenol	90	14	30 - 130	147	30	LCS-L	LCSRPD J * UJ All
4-Chloroaniline	75	82	40 - 140	9	30		
2-Chlorophenol	89	92	30 - 130	3	30		
2,6-Dinitrotoluene	46	48	40 - 140	4	30		
Phenol	88	94	30 - 130	7	30		
1,4-Dichlorobenzene	78	78	40 - 140	0	30		
Bis(2-chloroethoxy)methane	89	89	40 - 140	0	30		
2-Chloronaphthalene	83	86	40 - 140	3	30		
N-Nitrosodi-n-propylamine	90	90		1			
4-Chlorophenyl phenyl ether	90	90		0			
4-Chloro-3-methylphenol	91	104		13			
Benzo[a]pyrene	89	93	40 - 140	5	30		
4-Methylphenol	99	97		2			
4-Nitroaniline	65	69		7			
2-Nitroaniline	96	105		9			
Caprolactam	87	117		29			
Carbazole	83	85		3			
4,6-Dinitro-2-methylphenol	71	83		15			
1-Methylnaphthalene	95	92		3			
N-Nitrosodiphenylamine	54	55		1			
Atrazine	82	100	40 - 140	20	30		
Phenyl ether	123	108		13			
Benzaldehyde	90	95		6			
Azobenzene	268	258	40 - 140	4 ok	30	E *	E * All ND
Hexachlorocyclopentadiene	72	76		5			
3-Nitroaniline	67	90		29			

FORM VIII
GC/MS SEMI VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Buffalo Job No.: 480-30346-1

SDG No.:

Sample No.: CCVIS 480-96803/2 Date Analyzed: 12/20/2012 10:36

Instrument ID: HP5973X GC Column: RXI-5Sil MS ID: 0.25(mm)

Lab File ID (Standard): X3191.D Heated Purge: (Y/N) N

Calibration ID: 11641

		PHN		CRY		PRY	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1001444	13.08	792610	15.73	796790	17.01
UPPER LIMIT		2002888	13.58	1585220	16.23	1593580	17.51
LOWER LIMIT		500722	12.58	396305	15.23	398395	16.51
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 480-96561/1-A		503443	13.11	437519	15.75	487766	17.04
LCS 480-96561/2-A		656111	13.11	505522	15.75	573004	17.03
LCSD 480-96561/3-A		686463	13.10	479631	15.75	553861	17.03
480-30346-4	OC-SB-519-0.0/1.0-XXX	542407	13.10	524759	15.74	944726	17.00
480-30346-5	OC-SB-519-8.0/10-XXX	492943*	13.12	398118	15.76	318635*	17.05
480-30346-6	OC-SB-519-12/14-XXX	590381	13.12	545221	15.75	380222*	17.04
480-30346-8	OC-SB-518-8.0/10-XXX	582041	13.12	579685	15.76	396213*	17.04

IS-L J/UJ

PHN = Phenanthrene-d10
CRY = Chrysene-d12
PRY = Perylene-d12

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8270D

FORM VI
GC/MS SEMI VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Buffalo Job No.: 480-30346-1 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	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/UL)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Diphenylamine NA	PHN	Ave	14149 2811342	101850 2356835	224688 3579551	553188 4516590	1192504	0.100 8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
N-Nitrosodiphenylamine J	PHN	Ave	14018 2811342	101850 2356835	224688 3579551	553188 4516590	1192504	0.100 8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
1,2-Diphenylhydrazine NA	PHN	Ave	1848610	59521 1504259	109056 2548510	326470 3210046	717552	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Azobenzene UJ	PHN	Ave	1848610	58380 1504259	109056 2548510	326470 3210046	717552	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Benzophenone	ANT	Ave	1589648	66890 1371516	116350 1996456	328414 2666580	601879	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
4-Bromophenyl phenyl ether UJ	PHN	Ave	449135	16508 356637	31913 580487	81359 812265	167439	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Hexachlorobenzene UJ	PHN	Lin1	1588 457006	12854 356606	33846 589002	87913 804600	190748	0.100 8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Atrazine	ANT	Ave	1022023	36768 851009	75813 1304842	191176 +++++	415457	16.0	1.00 20.0	2.00 30.0	5.00 +++++	10.0
Pentachloronitrobenzene NA	PHN	Lin1	248006	4787 203475	11461 318145	34231 438981	92665	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Pentachlorophenol UJ	PHN	Lin1	454013	11106 350777	11624 608194	54999 828322	158642	16.0	1.00 20.0	2.00 30.0	5.00 40.0	10.0
Phenanthrene	PHN	Ave	18513 2527721	103962 2095399	220154 3201534	518661 4084154	1084497	0.100 8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Anthracene	PHN	Ave	21852 2585516	99410 2168904	217098 3266266	507614 4076574	1085154	0.100 8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Carbazole	PHN	Ave	2442448	94048 2048671	190469 3130446	459119 4130457	1022385	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Di-n-butyl phthalate	PHN	Ave	15302 2901712	115750 2480138	236333 3612267	589349 4384075	1248342	0.100 8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Fluoranthene	PHN	Ave	2561675	87590 2140236	215639 3288993	506028 4129184	1101355	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Benzidine	CRY	Ave	967877	41270 948443	107316 1260094	241214 +++++	420563	8.00	0.500 10.0	1.00 15.0	2.50 +++++	5.00
Pyrene	CRY	Ave	2601583	115288 2193396	228073 3285656	527811 4232522	1131711	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Butyl benzyl phthalate	CRY	Ave	1505198	58314 1240379	114162 1940877	281281 2580426	623033	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Bis(2-ethylhexyl) phthalate	CRY	Ave	20666 1973002	76558 1684176	160627 2573585	384752 3272340	828734	0.100 8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
3,3'-Dichlorobenzidine	CRY	Ave	954780	22877 802227	68680 1279655	174974 1766084	370716	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00
Benzo[a]anthracene	CRY	Ave	2260080	76037 1887844	161424 2920963	384718 3772548	958718	8.00	0.500 10.0	1.00 15.0	2.50 20.0	5.00

FORM VI
GC/MS SEMI VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Buffalo Job No.: 480-30346-1 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	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/UL)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Chrysene	CRY	Ave		134023	252184	491288	899840		0.500	1.00	2.50	5.00
			2128833	1725366	2735712	3555688		8.00	10.0	15.0	20.0	
Di-n-octyl phthalate	CRY	Ave	32062	131786	281150	617182	1360557	0.100	0.500	1.00	2.50	5.00
			3000016	2547438	3795638	4702329		8.00	10.0	15.0	20.0	
Benzo[b]fluoranthene	PRY	Ave		86485	174956	421949	958574		0.500	1.00	2.50	5.00
			2362892	1995763	3136607	4108649		8.00	10.0	15.0	20.0	
Benzo[k]fluoranthene	PRY	Ave		96066	177253	489235	1052157		0.500	1.00	2.50	5.00
			2403639	1919421	2965033	3933673		8.00	10.0	15.0	20.0	
Benzo[a]pyrene	PRY	Ave	20183	93850	174699	433943	889246	0.100	0.500	1.00	2.50	5.00
			2088226	1767745	2781641	3670790		8.00	10.0	15.0	20.0	
Dibenz(a,h)anthracene	PRY	Ave		83623	129231	361538	813075		0.500	1.00	2.50	5.00
			2044151	1672694	2815421	4058513		8.00	10.0	15.0	20.0	
Indeno[1,2,3-cd]pyrene	PRY	Ave		93718	167625	413973	959184		0.500	1.00	2.50	5.00
			2410742	2018453	3334925	4648434		8.00	10.0	15.0	20.0	
Benzo[g,h,i]perylene	PRY	Ave		71847	168957	331317	830876		0.500	1.00	2.50	5.00
			1994596	1495294	2753072	4058645		8.00	10.0	15.0	20.0	
2-Fluorophenol	DCB	Ave		18987	51938	111406	260416		0.500	1.00	2.50	5.00
			654708	551618	876197	1235087		8.00	10.0	15.0	20.0	
Phenol-d5	DCB	Ave		18843	67367	134813	315382		0.500	1.00	2.50	5.00
			844048	654753	1090919	1537425		8.00	10.0	15.0	20.0	
Nitrobenzene-d5	NPT	Ave		20141	57504	149020	336143		0.500	1.00	2.50	5.00
			822289	688051	1131674	1556096		8.00	10.0	15.0	20.0	
2-Fluorobiphenyl	ANT	Ave		51351	131707	327537	714759		0.500	1.00	2.50	5.00
			1780602	1394341	2307495	3065397		8.00	10.0	15.0	20.0	
2,4,6-Tribromophenol	PHN	Ave		7887	15302	37478	92242		0.500	1.00	2.50	5.00
			212336	178118	302392	382130		8.00	10.0	15.0	20.0	
p-Terphenyl-d14	CRY	Ave		83050	141897	381301	798713		0.500	1.00	2.50	5.00
			1943117	1581956	2494236	3246910		8.00	10.0	15.0	20.0	

Curve Type Legend:
Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
QuaF = Quadratic ISTD forced zero

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-0.0/1.0-XXX**

Lab Sample ID: 480-30346-4

Client Matrix: Solid

% Moisture: 33.8

Date Sampled: 12/14/2012 0900

Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3206.D
Dilution:	1.0			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/20/2012 1658			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
~~Bis(2-ethylhexyl) phthalate~~		~~2900~~	~~E~~	~~100~~	~~250~~
2,4,5-Trichlorophenol		ND		16	50
Aniline		ND		15	50
Hexachloroethane		ND		15	50
Dimethyl phthalate		ND		15	50
2,4-Dimethylphenol		ND		15	50
Isophorone		ND		15	50
Fluorene		ND		15	50
Dibenzofuran		ND		15	50
Acenaphthylene		ND		15	50
2,4-Dichlorophenol		ND		15	50
Benzo[g,h,i]perylene		15	J	15	50
Hexachlorobenzene		ND		15	50
Di-n-octyl phthalate		ND		15	50
Hexachlorobutadiene		ND		15	50
Phenanthrene		96		15	50
2-Nitrophenol		ND		19	50
Benzo[k]fluoranthene		ND		25	50
2,4-Dinitrophenol		ND J		40	50
Anthracene		94		15	50
2-Methylnaphthalene		ND		15	50
Di-n-butyl phthalate		ND		75	250
1,2,4-Trichlorobenzene		ND		15	50
Pyrene		170		15	50
2,4-Dinitrotoluene		ND		15	50
Dibenz(a,h)anthracene		ND		15	50
1,3-Dichlorobenzene		ND		15	50
Nitrobenzene		ND		15	50
Naphthalene		ND		15	50
2,4,6-Trichlorophenol		ND		21	50
Pentachlorophenol		ND		15	50
Fluoranthene		220		15	50
3,3'-Dichlorobenzidine		ND		18	100
4-Bromophenyl phenyl ether		ND		15	50
Diethyl phthalate		ND		16	50
2-Methylphenol		ND		15	50
1,2-Dichlorobenzene		ND		15	50
2,2'-oxybis[1-chloropropane]		ND		15	50
Acetophenone		20	J	15	50
Bis(2-chloroethyl)ether		ND		15	50
Benzo[a]anthracene		120		15	50
Indeno[1,2,3-cd]pyrene		ND		15	50
Butyl benzyl phthalate		ND		15	50
Chrysene		100		15	50
Acenaphthene		ND		15	50
Benzo[b]fluoranthene		ND		15	50

3/15/13 bkm

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-0.0/1.0-XXX**

Lab Sample ID: 480-30346-4

Client Matrix: Solid

% Moisture: 33.8

Date Sampled: 12/14/2012 0900

Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3206.D
Dilution:	1.0			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/20/2012 1658			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND J		21	250
4-Chloroaniline		ND		45	100
2-Chlorophenol		ND		15	50
2,6-Dinitrotoluene		ND		42	50
Phenol		ND		15	50
3 & 4 Methylphenol		ND		15	50
1,4-Dichlorobenzene		ND		15	50
Bis(2-chloroethoxy)methane		ND		15	50
2-Chloronaphthalene		ND		15	50
N-Nitrosodi-n-propylamine		ND		15	50
4-Chlorophenyl phenyl ether		ND		15	50
4-Chloro-3-methylphenol		ND		15	100
Benzo[a]pyrene		30	J	15	50
4-Methylphenol		ND		15	50
4-Nitroaniline		ND		42	250
2-Nitroaniline		ND		63	250
Caprolactam		ND		15	50
Carbazole		ND		15	50
4,6-Dinitro-2-methylphenol		ND		48	250
1-Methylnaphthalene		ND		15	50
N-Nitrosodiphenylamine		110		15	50
Atrazine		ND		15	50
Phenyl ether		120		15	50
Benzaldehyde		160		15	50
Azobenzene		ND		15	50
Hexachlorocyclopentadiene		ND		15	100
3-Nitroaniline		ND		15	250
N-Nitrosodimethylamine		ND		15	50
Benzyl alcohol		ND		15	100
1,1'-Biphenyl		32	J	15	50
2,3,4,6-Tetrachlorophenol		ND		15	50
Benzophenone		ND		15	50
Benzoic acid		ND		22	250
1,2,4,5-Tetrachlorobenzene		ND		15	50

3/15/13 BAW

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	83		30 - 130
2-Fluorophenol	71		30 - 130
Nitrobenzene-d5	75		30 - 130
Phenol-d5	66		30 - 130
2-Fluorobiphenyl	76		30 - 130
p-Terphenyl-d14	56		30 - 130

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-0.0/1.0-XXX**

Lab Sample ID: 480-30346-4
Client Matrix: Solid
% Moisture: 33.8

Date Sampled: 12/14/2012 0900
Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3206.D
Dilution:	1.0			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/20/2012 1658			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 7

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~4.20~~	~~5900~~	~~T J~~
~~122-39-4~~	~~Diphenylamine~~	~~12.11~~	~~110~~	
	Unknown	15.05	100	~~T~~ J N
	Unknown	16.22	110	~~T~~ J N
	Unknown	16.52	44	~~T~~ J N
593-45-3	Octadecane	16.69	25	~~T~~ J N
21129-9-9	1,2-Tetradecanediol	16.80	33	~~T~~ J N

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-0.0/1.0-XXX**

Lab Sample ID: 480-30346-4

Client Matrix: Solid

% Moisture: 33.8

Date Sampled: 12/14/2012 0900

Date Received: 12/14/2012 1700

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:	X3224.D
Dilution:	10			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/21/2012 1104	Run Type:	DL	Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		4900		1000	2500
~~2,4,5-Trichlorophenol~~		~~ND~~		~~160~~	~~500~~
Aniline		ND		150	500
Hexachloroethane		ND		150	500
Dimethyl phthalate		ND		150	500
2,4-Dimethylphenol		ND		150	500
Isophorone		ND		150	500
Fluorene		ND		150	500
Dibenzofuran		ND		150	500
Acenaphthylene		ND		150	500
2,4-Dichlorophenol		ND		150	500
Benzo[g,h,i]perylene		ND		150	500
Hexachlorobenzene		ND		150	500
Di-n-octyl phthalate		ND		150	500
Hexachlorobutadiene		ND		150	500
Phenanthrene		ND		150	500
2-Nitrophenol		ND		190	500
Benzo[k]fluoranthene		ND		250	500
2,4-Dinitrophenol		ND		400	500
Anthracene		ND		150	500
2-Methylnaphthalene		ND		150	500
Di-n-butyl phthalate		ND		750	2500
1,2,4-Trichlorobenzene		ND		150	500
Pyrene		210	J	150	500
2,4-Dinitrotoluene		ND		150	500
Dibenz(a,h)anthracene		ND		150	500
1,3-Dichlorobenzene		ND		150	500
Nitrobenzene		ND		150	500
Naphthalene		ND		150	500
2,4,6-Trichlorophenol		ND		210	500
Pentachlorophenol		ND		150	500
Fluoranthene		230	J	150	500
3,3'-Dichlorobenzidine		ND		180	1000
4-Bromophenyl phenyl ether		ND		150	500
Diethyl phthalate		ND		160	500
2-Methylphenol		ND		150	500
1,2-Dichlorobenzene		ND		150	500
2,2'-oxybis[1-chloropropane]		ND		150	500
Acetophenone		ND		150	500
Bis(2-chloroethyl)ether		ND		150	500
Benzo[a]anthracene		ND		150	500
Indeno[1,2,3-cd]pyrene		ND		150	500
Butyl benzyl phthalate		ND		150	500
Chrysene		ND		150	500
Acenaphthene		ND		150	500
~~Benzo[b]fluoranthene~~		~~ND~~		~~150~~	~~500~~

3/5/13 [illegible]

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-0.0/1.0-XXX**

Lab Sample ID: 480-30346-4
Client Matrix: Solid
% Moisture: 33.8

Date Sampled: 12/14/2012 0900
Date Received: 12/14/2012 1700

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:	X3224.D
Dilution:	10			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/21/2012 1104	Run Type:	DL	Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND	*	210	2500
4-Chloroaniline		ND		450	1000
2-Chlorophenol		ND		150	500
2,6-Dinitrotoluene		ND		420	500
Phenol		ND		150	500
3 & 4 Methylphenol		ND		150	500
1,4-Dichlorobenzene		ND		150	500
Bis(2-chloroethoxy)methane		ND		150	500
2-Chloronaphthalene		ND		150	500
N-Nitrosodi-n-propylamine		ND		150	500
4-Chlorophenyl phenyl ether		ND		150	500
4-Chloro-3-methylphenol		ND		150	1000
Benzo[a]pyrene		ND		150	500
4-Methylphenol		ND		150	500
4-Nitroaniline		ND		420	2500
2-Nitroaniline		ND		630	2500
Caprolactam		ND		150	500
Carbazole		ND		150	500
4,6-Dinitro-2-methylphenol		ND		480	2500
1-Methylnaphthalene		ND		150	500
N-Nitrosodiphenylamine		ND		150	500
Atrazine		ND		150	500
Phenyl ether		ND		150	500
Benzaldehyde		ND		150	500
Azobenzene		ND	*	150	500
Hexachlorocyclopentadiene		ND		150	1000
3-Nitroaniline		ND		150	2500
N-Nitrosodimethylamine		ND		150	500
Benzyl alcohol		ND		150	1000
1,1'-Biphenyl		ND		150	500
2,3,4,6-Tetrachlorophenol		ND		150	500
Benzophenone		ND		150	500
Benzoic acid		ND		220	2500
1,2,4,5-Tetrachlorobenzene		ND		150	500

3/15/13

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

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-0.0/1.0-XXX**

Lab Sample ID: 480-30346-4
Client Matrix: Solid
% Moisture: 33.8

Date Sampled: 12/14/2012 0900
Date Received: 12/14/2012 1700

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:	X3224.D
Dilution:	10			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/21/2012 1104	Run Type:	DL	Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	Unknown	4.17	6700	T J
108-38-3	Benzene, 1,3-dimethyl-	4.65	2500	T J N
	Unknown	9.61	620	T J
	Unknown	15.06	3200	T J
	Unknown	16.14	640	T J
54833-48-6	Heptadecane, 2,6,10,15-tetramethyl-	16.69	760	T J N
26603-23-6	p,p'-Dioctyldiphenylamine	17.00	11000	T J N
	Unknown	18.16	620	T J
	Unknown	18.27	880	T J
	Unknown	18.51	1900	T J

3/15/13 BAK

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-8.0/10-XXX**

Lab Sample ID: 480-30346-5

Client Matrix: Solid

% Moisture: 24.1

Date Sampled: 12/14/2012 0920

Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3207.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/20/2012 1724			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		88	220
2,4,5-Trichlorophenol		ND		14	44
Aniline		ND		13	44
Hexachloroethane		ND		13	44
Dimethyl phthalate		ND		13	44
2,4-Dimethylphenol		ND		13	44
Isophorone		ND		13	44
Fluorene		ND		13	44
Dibenzofuran		ND		13	44
Acenaphthylene		ND		13	44
2,4-Dichlorophenol		ND		13	44
Benzo[g,h,i]perylene		ND J		13	44
Hexachlorobenzene		ND J		13	44
Di-n-octyl phthalate		ND		13	44
Hexachlorobutadiene		ND		13	44
Phenanthrene		ND J		13	44
2-Nitrophenol		ND		17	44
Benzo[k]fluoranthene		ND J		22	44
2,4-Dinitrophenol		ND J		35	44
Anthracene		ND J		13	44
2-Methylnaphthalene		ND		13	44
Di-n-butyl phthalate		ND J		66	220
1,2,4-Trichlorobenzene		ND		13	44
Pyrene		ND		13	44
2,4-Dinitrotoluene		ND		13	44
Dibenz(a,h)anthracene		ND J		13	44
1,3-Dichlorobenzene		ND		13	44
Nitrobenzene		ND		13	44
Naphthalene		ND		13	44
2,4,6-Trichlorophenol		ND		18	44
Pentachlorophenol		ND J		13	44
Fluoranthene		ND J		13	44
3,3'-Dichlorobenzidine		ND		16	88
4-Bromophenyl phenyl ether		ND J		13	44
Diethyl phthalate		ND		14	44
2-Methylphenol		ND		13	44
1,2-Dichlorobenzene		ND		13	44
2,2'-oxybis[1-chloropropane]		ND		13	44
Acetophenone		ND		13	44
Bis(2-chloroethyl)ether		ND		13	44
Benzo[a]anthracene		ND		13	44
Indeno[1,2,3-cd]pyrene		ND J		13	44
Butyl benzyl phthalate		ND		13	44
Chrysene		ND		13	44
Acenaphthene		ND		13	44
Benzo[b]fluoranthene		ND J		13	44

3/15/13 BAD

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-8.0/10-XXX**

Lab Sample ID: 480-30346-5
Client Matrix: Solid
% Moisture: 24.1

Date Sampled: 12/14/2012 0920
Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3207.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/20/2012 1724			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND J		18	220
4-Chloroaniline		ND		39	88
2-Chlorophenol		ND		13	44
2,6-Dinitrotoluene		ND		37	44
Phenol		ND		13	44
3 & 4 Methylphenol		ND		13	44
1,4-Dichlorobenzene		ND		13	44
Bis(2-chloroethoxy)methane		ND		13	44
2-Chloronaphthalene		ND		13	44
N-Nitrosodi-n-propylamine		ND		13	44
4-Chlorophenyl phenyl ether		ND		13	44
4-Chloro-3-methylphenol		ND		13	88
Benzo[a]pyrene		ND J		13	44
4-Methylphenol		ND		13	44
4-Nitroaniline		ND		37	220
2-Nitroaniline		ND		55	220
Caprolactam		ND		13	44
Carbazole		ND J		13	44
4,6-Dinitro-2-methylphenol		ND		42	220
1-Methylnaphthalene		ND		13	44
N-Nitrosodiphenylamine		50 J		13	44
Atrazine		ND		13	44
Phenyl ether		ND		13	44
Benzaldehyde		ND		13	44
Azobenzene		ND J		13	44
Hexachlorocyclopentadiene		ND		13	88
3-Nitroaniline		ND		13	220
N-Nitrosodimethylamine		ND		13	44
Benzyl alcohol		ND		13	88
1,1'-Biphenyl		ND		13	44
2,3,4,6-Tetrachlorophenol		ND		13	44
Benzophenone		ND		13	44
Benzoic acid		ND		20	220
1,2,4,5-Tetrachlorobenzene		ND		13	44

3/15/13 BBG

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	115		30 - 130
2-Fluorophenol	103		30 - 130
Nitrobenzene-d5	92		30 - 130
Phenol-d5	89		30 - 130
2-Fluorobiphenyl	112		30 - 130
p-Terphenyl-d14	103		30 - 130

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-8.0/10-XXX**

Lab Sample ID: 480-30346-5
Client Matrix: Solid
% Moisture: 24.1

Date Sampled: 12/14/2012 0920
Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3207.D
Dilution:	1.0			Initial Weight/Volume:	000030.1 g
Analysis Date:	12/20/2012 1724			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~3.84~~	~~84~~	~~T J~~
	~~Unknown~~	~~4.21~~	~~7500~~	~~T J~~
	~~Unknown~~	~~4.23~~	~~40~~	~~T J~~
~~122-39-4~~	~~Diphenylamine~~	~~12.13~~	~~50~~	
	Unknown	13.78	64	~~T~~ J N
14949-12-3	5.beta.-Cholest-23-ene, (Z)-	15.31	46	~~T~~ J N
	Unknown	16.41	78	~~T~~ J N
~~7683-64-9~~	~~Squalene~~	~~16.48~~	~~160~~	~~T J N~~
	Unknown	16.69	100	~~T~~ J N
	Unknown	16.98	53	~~T~~ J N

TC
3/15/13

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-12/14-XXX**

Lab Sample ID: 480-30346-6
Client Matrix: Solid
% Moisture: 21.7

Date Sampled: 12/14/2012 0940
Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3208.D
Dilution:	1.0			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/20/2012 1749			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		84	210
2,4,5-Trichlorophenol		ND		14	42
Aniline		ND		13	42
Hexachloroethane		ND		13	42
Dimethyl phthalate		ND		13	42
2,4-Dimethylphenol		ND		13	42
Isophorone		ND		13	42
Fluorene		ND		13	42
Dibenzofuran		ND		13	42
Acenaphthylene		ND		13	42
2,4-Dichlorophenol		ND		13	42
Benzo[g,h,i]perylene		ND J		13	42
Hexachlorobenzene		ND		13	42
Di-n-octyl phthalate		ND		13	42
Hexachlorobutadiene		ND		13	42
Phenanthrene		ND		13	42
2-Nitrophenol		ND		16	42
Benzo[k]fluoranthene		ND J		21	42
2,4-Dinitrophenol		ND J		34	42
Anthracene		ND		13	42
2-Methylnaphthalene		ND		13	42
Di-n-butyl phthalate		ND		63	210
1,2,4-Trichlorobenzene		ND		13	42
Pyrene		ND		13	42
2,4-Dinitrotoluene		ND		13	42
Dibenz(a,h)anthracene		ND J		13	42
1,3-Dichlorobenzene		ND		13	42
Nitrobenzene		ND		13	42
Naphthalene		ND		13	42
2,4,6-Trichlorophenol		ND		18	42
Pentachlorophenol		ND		13	42
Fluoranthene		ND		13	42
3,3'-Dichlorobenzidine		ND		15	84
4-Bromophenyl phenyl ether		ND		13	42
Diethyl phthalate		ND		14	42
2-Methylphenol		ND		13	42
1,2-Dichlorobenzene		ND		13	42
2,2'-oxybis[1-chloropropane]		ND		13	42
Acetophenone		ND		13	42
Bis(2-chloroethyl)ether		ND		13	42
Benzo[a]anthracene		ND		13	42
Indeno[1,2,3-cd]pyrene		ND J		13	42
Butyl benzyl phthalate		ND		13	42
Chrysene		ND		13	42
Acenaphthene		ND		13	42
Benzo[b]fluoranthene		ND J		13	42

3/15/13

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-12/14-XXX**

Lab Sample ID: 480-30346-6
Client Matrix: Solid
% Moisture: 21.7

Date Sampled: 12/14/2012 0940
Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3208.D
Dilution:	1.0			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/20/2012 1749			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND J		18	210
4-Chloroaniline		ND		38	84
2-Chlorophenol		ND		13	42
2,6-Dinitrotoluene		ND		35	42
Phenol		ND		13	42
3 & 4 Methylphenol		ND		13	42
1,4-Dichlorobenzene		ND		13	42
Bis(2-chloroethoxy)methane		ND		13	42
2-Chloronaphthalene		ND		13	42
N-Nitrosodi-n-propylamine		ND		13	42
4-Chlorophenyl phenyl ether		ND		13	42
4-Chloro-3-methylphenol		ND		13	84
Benzo[a]pyrene		ND J		13	42
4-Methylphenol		ND		13	42
4-Nitroaniline		ND		35	210
2-Nitroaniline		ND		53	210
Caprolactam		ND		13	42
Carbazole		ND		13	42
4,6-Dinitro-2-methylphenol		ND		40	210
1-Methylnaphthalene		ND		13	42
N-Nitrosodiphenylamine		ND		13	42
Atrazine		ND		13	42
Phenyl ether		ND		13	42
Benzaldehyde		ND		13	42
Azobenzene		ND		13	42
Hexachlorocyclopentadiene		ND		13	84
3-Nitroaniline		ND		13	210
N-Nitrosodimethylamine		ND		13	42
Benzyl alcohol		ND		13	84
1,1'-Biphenyl		ND		13	42
2,3,4,6-Tetrachlorophenol		ND		13	42
Benzophenone		ND		13	42
Benzoic acid		ND		19	210
1,2,4,5-Tetrachlorobenzene		ND		13	42

3/15/13 BAG

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	114		30 - 130
2-Fluorophenol	85		30 - 130
Nitrobenzene-d5	73		30 - 130
Phenol-d5	76		30 - 130
2-Fluorobiphenyl	107		30 - 130
p-Terphenyl-d14	77		30 - 130

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-519-12/14-XXX**

Lab Sample ID: 480-30346-6
Client Matrix: Solid
% Moisture: 21.7

Date Sampled: 12/14/2012 0940
Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3208.D
Dilution:	1.0			Initial Weight/Volume:	000030.6 g
Analysis Date:	12/20/2012 1749			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~3.85~~	~~77~~	~~T J~~
	~~Unknown~~	~~4.22~~	~~6200~~	~~T J~~
	~~Unknown~~	~~4.24~~	~~40~~	~~T J~~
	Unknown	6.34	31	~~T~~ J N
	Unknown	13.77	29	~~T~~ J N
	~~Unknown~~	~~16.13~~	~~32~~	~~T J~~
STET	~~Unknown~~	~~16.40~~	~~190~~	~~T J~~
~~7683-64-9~~	~~Squalene~~	~~16.47~~	~~230~~	~~T J N~~
	Unknown	16.68	55	~~T~~ J N
	Unknown	16.99	91	~~T~~ J N

TC
3/23/13

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-518-0.0/1.0-XXX**

Lab Sample ID: 480-30346-7
Client Matrix: Solid
% Moisture: 28.7

Date Sampled: 12/14/2012 0955
Date Received: 12/14/2012 1700

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:	X3231.D
Dilution:	500			Initial Weight/Volume:	000030.7 g
Analysis Date:	12/21/2012 1508			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		340000		46000	110000
2,4,5-Trichlorophenol		ND		7500	23000
Aniline		ND		6900	23000
Hexachloroethane		ND		6900	23000
Dimethyl phthalate		ND		6900	23000
2,4-Dimethylphenol		ND		6900	23000
Isophorone		ND		6900	23000
Fluorene		ND		6900	23000
Dibenzofuran		ND		6900	23000
Acenaphthylene		ND		6900	23000
2,4-Dichlorophenol		ND		6900	23000
Benzo[g,h,i]perylene		ND		6900	23000
Hexachlorobenzene		ND		6900	23000
Di-n-octyl phthalate		ND		6900	23000
Hexachlorobutadiene		ND		6900	23000
Phenanthrene		ND		6900	23000
2-Nitrophenol		ND		8900	23000
Benzo[k]fluoranthene		ND		12000	23000
2,4-Dinitrophenol		ND J		18000	23000
Anthracene		ND		6900	23000
2-Methylnaphthalene		ND		6900	23000
Di-n-butyl phthalate		ND		34000	110000
1,2,4-Trichlorobenzene		ND		6900	23000
Pyrene		ND		6900	23000
2,4-Dinitrotoluene		ND		6900	23000
Dibenz(a,h)anthracene		ND		6900	23000
1,3-Dichlorobenzene		ND		6900	23000
Nitrobenzene		ND		6900	23000
Naphthalene		ND		6900	23000
2,4,6-Trichlorophenol		ND		9600	23000
Pentachlorophenol		ND		6900	23000
Fluoranthene		ND		6900	23000
3,3'-Dichlorobenzidine		ND		8200	46000
4-Bromophenyl phenyl ether		ND		6900	23000
Diethyl phthalate		ND		7500	23000
2-Methylphenol		ND		6900	23000
1,2-Dichlorobenzene		ND		6900	23000
2,2'-oxybis[1-chloropropane]		ND		6900	23000
Acetophenone		ND		6900	23000
Bis(2-chloroethyl)ether		ND		6900	23000
Benzo[a]anthracene		ND		6900	23000
Indeno[1,2,3-cd]pyrene		ND		6900	23000
Butyl benzyl phthalate		ND		6900	23000
Chrysene		ND		6900	23000
Acenaphthene		ND		6900	23000
Benzo[b]fluoranthene		ND		6900	23000

31.5lb

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-518-0.0/1.0-XXX**

Lab Sample ID: 480-30346-7
Client Matrix: Solid
% Moisture: 28.7

Date Sampled: 12/14/2012 0955
Date Received: 12/14/2012 1700

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:	X3231.D
Dilution:	500			Initial Weight/Volume:	000030.7 g
Analysis Date:	12/21/2012 1508			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND J		9600	110000
4-Chloroaniline		ND		21000	46000
2-Chlorophenol		ND		6900	23000
2,6-Dinitrotoluene		ND		19000	23000
Phenol		ND		6900	23000
3 & 4 Methylphenol		ND		6900	23000
1,4-Dichlorobenzene		ND		6900	23000
Bis(2-chloroethoxy)methane		ND		6900	23000
2-Chloronaphthalene		ND		6900	23000
N-Nitrosodi-n-propylamine		ND		6900	23000
4-Chlorophenyl phenyl ether		ND		6900	23000
4-Chloro-3-methylphenol		ND		6900	46000
Benzo[a]pyrene		ND		6900	23000
4-Methylphenol		ND		6900	23000
4-Nitroaniline		ND		19000	110000
2-Nitroaniline		ND		29000	110000
Caprolactam		ND		6900	23000
Carbazole		ND		6900	23000
4,6-Dinitro-2-methylphenol		ND		22000	110000
1-Methylnaphthalene		ND		6900	23000
N-Nitrosodiphenylamine		ND		6900	23000
Atrazine		ND		6900	23000
Phenyl ether		ND		6900	23000
Benzaldehyde		ND		6900	23000
Azobenzene		ND		6900	23000
Hexachlorocyclopentadiene		ND		6900	46000
3-Nitroaniline		ND		6900	110000
N-Nitrosodimethylamine		ND		6900	23000
Benzyl alcohol		ND		6900	46000
1,1'-Biphenyl		ND		6900	23000
2,3,4,6-Tetrachlorophenol		ND		6900	23000
Benzophenone		ND		6900	23000
Benzoic acid		ND		10000	110000
1,2,4,5-Tetrachlorobenzene		ND		6900	23000

3/15/13

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

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-518-0.0/1.0-XXX**

Lab Sample ID: 480-30346-7
Client Matrix: Solid
% Moisture: 28.7

Date Sampled: 12/14/2012 0955
Date Received: 12/14/2012 1700

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:	X3231.D
Dilution:	500			Initial Weight/Volume:	000030.7 g
Analysis Date:	12/21/2012 1508			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 3

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
~~84-74-2~~	~~Dibutyl phthalate~~	~~14.87~~	~~12000~~	~~T J N~~
	Unknown	15.85	17000	~~T~~ J N
	Unknown	16.99	34000	~~T~~ J N

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-518-8.0/10-XXX**

Lab Sample ID: 480-30346-8
Client Matrix: Solid
% Moisture: 21.0

Date Sampled: 12/14/2012 1005
Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3210.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1840			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		ND		84	210
2,4,5-Trichlorophenol		ND		14	42
Aniline		ND		12	42
Hexachloroethane		ND		12	42
Dimethyl phthalate		ND		12	42
2,4-Dimethylphenol		ND		12	42
Isophorone		ND		12	42
Fluorene		ND		12	42
Dibenzofuran		ND		12	42
Acenaphthylene		ND		12	42
2,4-Dichlorophenol		ND		12	42
Benzo[g,h,i]perylene		ND J		12	42
Hexachlorobenzene		ND		12	42
Di-n-octyl phthalate		ND		12	42
Hexachlorobutadiene		ND		12	42
Phenanthrene		ND		12	42
2-Nitrophenol		ND		16	42
Benzo[k]fluoranthene		ND J		21	42
2,4-Dinitrophenol		ND J	*	34	42
Anthracene		ND		12	42
2-Methylnaphthalene		ND		12	42
Di-n-butyl phthalate		ND		62	210
1,2,4-Trichlorobenzene		ND		12	42
Pyrene		ND		12	42
2,4-Dinitrotoluene		ND		12	42
Dibenz(a,h)anthracene		ND J		12	42
1,3-Dichlorobenzene		ND		12	42
Nitrobenzene		ND		12	42
Naphthalene		ND		12	42
2,4,6-Trichlorophenol		ND		17	42
Pentachlorophenol		ND		12	42
Fluoranthene		ND		12	42
3,3'-Dichlorobenzidine		ND		15	83
4-Bromophenyl phenyl ether		ND		12	42
Diethyl phthalate		ND		14	42
2-Methylphenol		ND		12	42
1,2-Dichlorobenzene		ND		12	42
2,2'-oxybis[1-chloropropane]		ND		12	42
Acetophenone		ND		12	42
Bis(2-chloroethyl)ether		ND		12	42
Benzo[a]anthracene		ND		12	42
Indeno[1,2,3-cd]pyrene		ND		12	42
Butyl benzyl phthalate		ND J		12	42
Chrysene		ND		12	42
Acenaphthene		ND		12	42
Benzo[b]fluoranthene		ND J		12	42

3/15/13

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-518-8.0/10-XXX**

Lab Sample ID: 480-30346-8

Client Matrix: Solid

% Moisture: 21.0

Date Sampled: 12/14/2012 1005

Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3210.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1840			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND J	*	17	210
4-Chloroaniline		ND		37	83
2-Chlorophenol		ND		12	42
2,6-Dinitrotoluene		ND		35	42
Phenol		ND		12	42
3 & 4 Methylphenol		ND		12	42
1,4-Dichlorobenzene		ND		12	42
Bis(2-chloroethoxy)methane		ND		12	42
2-Chloronaphthalene		ND		12	42
N-Nitrosodi-n-propylamine		ND		12	42
4-Chlorophenyl phenyl ether		ND		12	42
4-Chloro-3-methylphenol		ND		12	83
Benzo[a]pyrene		ND J		12	42
4-Methylphenol		ND		12	42
4-Nitroaniline		ND		35	210
2-Nitroaniline		ND		52	210
Caprolactam		ND		12	42
Carbazole		ND		12	42
4,6-Dinitro-2-methylphenol		ND		40	210
1-Methylnaphthalene		ND		12	42
N-Nitrosodiphenylamine		ND		12	42
Atrazine		ND		12	42
Phenyl ether		ND		12	42
Benzaldehyde		ND		12	42
Azobenzene		ND	*	12	42
Hexachlorocyclopentadiene		ND		12	83
3-Nitroaniline		ND		12	210
N-Nitrosodimethylamine		ND		12	42
Benzyl alcohol		ND		12	83
1,1'-Biphenyl		ND		12	42
2,3,4,6-Tetrachlorophenol		ND		12	42
Benzophenone		ND		12	42
Benzoic acid		ND		19	210
1,2,4,5-Tetrachlorobenzene		ND		12	42

3/15/13

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4,6-Tribromophenol	81		30 - 130
2-Fluorophenol	54		30 - 130
Nitrobenzene-d5	55		30 - 130
Phenol-d5	65		30 - 130
2-Fluorobiphenyl	78		30 - 130
p-Terphenyl-d14	65		30 - 130

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-518-8.0/10-XXX**

Lab Sample ID: 480-30346-8
Client Matrix: Solid
% Moisture: 21.0

Date Sampled: 12/14/2012 1005
Date Received: 12/14/2012 1700

8270D Semivolatile Organic Compounds (GC/MS) Low Level

Analysis Method:	8270D	Analysis Batch:	480-96803	Instrument ID:	HP5973X
Prep Method:	3546	Prep Batch:	480-96561	Lab File ID:	X3210.D
Dilution:	1.0			Initial Weight/Volume:	000030.4 g
Analysis Date:	12/20/2012 1840			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** **10**

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~3.86~~	~~63~~	~~T J~~
	~~Unknown~~	~~4.22~~	~~4700~~	~~T J~~
	~~Unknown~~	~~4.24~~	~~32~~	~~T J~~
~~95-47-6~~	~~Benzene, 1,2-dimethyl-~~	~~4.67~~	~~1100~~	~~T J N~~
	Unknown	6.35	27	~~T~~ J N
	Unknown	13.78	34	~~T~~ J N
	Unknown	16.14	30	~~T~~ J N
	Unknown	16.41	63	~~T~~ J N
	~~Unknown~~	~~16.47~~	~~100~~	~~T J~~
	Unknown	16.69	40	~~T~~ J N

TC
3/21/13

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-518-13/15-XXX**

Lab Sample ID: 480-30346-9

Client Matrix: Solid

% Moisture: 19.5

Date Sampled: 12/14/2012 1015

Date Received: 12/14/2012 1700

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:	X3226.D
Dilution:	20			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/21/2012 1154			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Bis(2-ethylhexyl) phthalate		12000		1600	4100
2,4,5-Trichlorophenol		ND		270	820
Aniline		ND		250	820
Hexachloroethane		ND		250	820
Dimethyl phthalate		ND		250	820
2,4-Dimethylphenol		ND		250	820
Isophorone		ND		250	820
Fluorene		ND		250	820
Dibenzofuran		ND		250	820
Acenaphthylene		ND		250	820
2,4-Dichlorophenol		ND		250	820
Benzo[g,h,i]perylene		ND		250	820
Hexachlorobenzene		ND		250	820
Di-n-octyl phthalate		ND		250	820
Hexachlorobutadiene		ND		250	820
Phenanthrene		ND		250	820
2-Nitrophenol		ND		320	820
Benzo[k]fluoranthene		ND		420	820
2,4-Dinitrophenol		ND J		660	820
Anthracene		ND		250	820
2-Methylnaphthalene		ND		250	820
Di-n-butyl phthalate		ND		1200	4100
1,2,4-Trichlorobenzene		ND		250	820
Pyrene		ND		250	820
2,4-Dinitrotoluene		ND		250	820
Dibenz(a,h)anthracene		ND		250	820
1,3-Dichlorobenzene		ND		250	820
Nitrobenzene		ND		250	820
Naphthalene		ND		250	820
2,4,6-Trichlorophenol		ND		340	820
Pentachlorophenol		ND		250	820
Fluoranthene		ND		250	820
3,3'-Dichlorobenzidine		ND		300	1600
4-Bromophenyl phenyl ether		ND		250	820
Diethyl phthalate		ND		270	820
2-Methylphenol		ND		250	820
1,2-Dichlorobenzene		ND		250	820
2,2'-oxybis[1-chloropropane]		ND		250	820
Acetophenone		ND		250	820
Bis(2-chloroethyl)ether		ND		250	820
Benzo[a]anthracene		ND		250	820
Indeno[1,2,3-cd]pyrene		ND		250	820
Butyl benzyl phthalate		ND		250	820
Chrysene		ND		250	820
Acenaphthene		ND		250	820
Benzo[b]fluoranthene		ND		250	820

3/05/13

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-518-13/15-XXX**

Lab Sample ID: 480-30346-9

Client Matrix: Solid

% Moisture: 19.5

Date Sampled: 12/14/2012 1015

Date Received: 12/14/2012 1700

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:	X3226.D
Dilution:	20			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/21/2012 1154			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4-Nitrophenol		ND J		340	4100
4-Chloroaniline		ND		740	1600
2-Chlorophenol		ND		250	820
2,6-Dinitrotoluene		ND		690	820
Phenol		ND		250	820
3 & 4 Methylphenol		ND		250	820
1,4-Dichlorobenzene		ND		250	820
Bis(2-chloroethoxy)methane		ND		250	820
2-Chloronaphthalene		ND		250	820
N-Nitrosodi-n-propylamine		ND		250	820
4-Chlorophenyl phenyl ether		ND		250	820
4-Chloro-3-methylphenol		ND		250	1600
Benzo[a]pyrene		ND		250	820
4-Methylphenol		ND		250	820
4-Nitroaniline		ND		690	4100
2-Nitroaniline		ND		1000	4100
Caprolactam		ND		250	820
Carbazole		ND		250	820
4,6-Dinitro-2-methylphenol		ND		790	4100
1-Methylnaphthalene		ND		250	820
N-Nitrosodiphenylamine		ND		250	820
Atrazine		ND		250	820
Phenyl ether		ND		250	820
Benzaldehyde		ND		250	820
Azobenzene		ND		250	820
Hexachlorocyclopentadiene		ND		250	1600
3-Nitroaniline		ND		250	4100
N-Nitrosodimethylamine		ND		250	820
Benzyl alcohol		ND		250	1600
1,1'-Biphenyl		ND		250	820
2,3,4,6-Tetrachlorophenol		ND		250	820
Benzophenone		ND		250	820
Benzoic acid		ND		370	4100
1,2,4,5-Tetrachlorobenzene		ND		250	820

3/15/13 [illegible]

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

Client: Olin Corporation

Job Number: 480-30346-1

Client Sample ID: **OC-SB-518-13/15-XXX**

Lab Sample ID: 480-30346-9
Client Matrix: Solid
% Moisture: 19.5

Date Sampled: 12/14/2012 1015
Date Received: 12/14/2012 1700

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:	X3226.D
Dilution:	20			Initial Weight/Volume:	000030.3 g
Analysis Date:	12/21/2012 1154			Final Weight/Volume:	1 mL
Prep Date:	12/19/2012 0930			Injection Volume:	1 uL

Tentatively Identified Compounds **Number TIC's Found:** 5

Cas Number	Analyte	RT	Est. Result (ug/Kg)	Qualifier
	~~Unknown~~	~~4.18~~	~~6800~~	~~T J~~
~~108-38-3~~	~~Benzene, 1,3-dimethyl-~~	~~4.66~~	~~1700~~	~~T J N~~
	Unknown	15.07	410	T J N
	Unknown	15.88	510	T J N
	Unknown	17.01	1000	T J N

TC
3/21/13

VOLATILE ORGANICS

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

TMP's only

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

SITE: Olin Chemical Project #: 6107130016-10 SDG #: 480-30346-1

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 (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%	224 TMP-2 LR used ✓
☑	☐	☐	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 all ND	
☐	☐	☑	Trip blank contamination Not submitted	
☐	☐	☑	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%)	
Field Duplicates ☐ ☐ ☑ RPD criteria (water <30%, soils <50%) met	Not collected w/ these samples
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	Ketone removed from data set

Validator's Signature: [signature]

Date: 2/17/13

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.

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: 2-17-13 Reviewer: Tige Cunningham

SDG 480-30346-1

☑ **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)

OC-SB-521-0.0/1.0-xxx %Solid was 18% Result was ND and rejected

3. QC Blanks

Cr^{+6} = ND

4. Laboratory Control Sample Review (% recovery 80-120, RPD 20)

Cr^{+6} LCS @ 75% J/UJ all soil results in SDG

5. Field Duplicate Precision (RPD 50)

Cr^{+6} Not analyzed

~~pH = OK~~ (TC) ~~ORP = OK~~ (TC)

6. Lab Duplicate Precision (RPD 35)

Cr^{+6} not analyzed

pH = OK ORP = OK

7. Matrix Spike Results (if applicable) (% recovery 75-125, RPD 35)

Cr^{+6}: Performed on OC-SB-521-0.0/1.0-xxx MS/MSD 0% reducing conditions
NO Quals

8. Surrogate Recovery (if applicable)

Not applicable.

9. Internal Standard Recovery (if applicable)

Not applicable.

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level (Continued)

Lab Sample ID: LCSD 480-96561/3-A
Matrix: Solid
Analysis Batch: 96803

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 96561

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
p-Terphenyl-d14	*80*		*30 - 130*

Method: 7199 - Chromium, Hexavalent (IC)

Lab Sample ID: MB 440-76769/1-A
Matrix: Solid
Analysis Batch: 76762

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 76769

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.20	0.15	mg/Kg		01/03/13 09:01	01/03/13 23:06	10

Lab Sample ID: LCS 440-76769/2-A
Matrix: Solid
Analysis Batch: 76762

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 76769

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	15.9	11.9		mg/Kg		75	65 - 110

Lab Sample ID: 480-30346-1 MS
Matrix: Solid
Analysis Batch: 76762

Client Sample ID: OC-SB-521-0.0/1.0-XXX
Prep Type: Total/NA
Prep Batch: 76769

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	ND		90.3	ND	F	mg/Kg	☼	0	55 - 110

Lab Sample ID: 480-30346-1 MSD
Matrix: Solid
Analysis Batch: 76762

Client Sample ID: OC-SB-521-0.0/1.0-XXX
Prep Type: Total/NA
Prep Batch: 76769

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cr (VI)	ND		90.5	ND	F	mg/Kg	☼	0	55 - 110	NC	20

Lab Sample ID: 480-30346-1 MSI
Matrix: Solid
Analysis Batch: 76762

Client Sample ID: OC-SB-521-0.0/1.0-XXX
Prep Type: Total/NA
Prep Batch: 76769

Analyte	Sample Result	Sample Qualifier	Spike Added	MSI Result	MSI Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	ND		10000	629	F	mg/Kg	☼	6	55 - 110

Lab Sample ID: MB 440-77607/1-A
Matrix: Solid
Analysis Batch: 77774

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 77607

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.0020	0.0015	mg/Kg		01/08/13 11:55	01/09/13 08:29	10

TC
2-17-13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine | Job No.: 480-30346-1

SDG No.:

Client Sample ID: OC-SB-521-0.0/1.0-XXX | Lab Sample ID: 480-30346-1

Matrix: Solid | Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199 | Date Collected: 12/14/2012 08:10

Extraction Method: 3060A | Date Extracted: 01/03/2013 09:01

Sample wt/vol: 1.2552(g) | Date Analyzed: 01/03/2013 23:32

Con. Extract Vol.: 50(mL) | Dilution Factor: 1000

Injection Volume: 1(uL) | GC Column: AS7 ID: 4(mm)

% Moisture: 82.4 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 76762 | Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	~~ND~~	R	110	85

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30346-1
SDG No.:
Client Sample ID: OC-SB-521-8.0/10-XXX
Lab Sample ID: 480-30346-2
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/14/2012 08:20
Extraction Method: 3060A
Date Extracted: 01/03/2013 09:01
Sample wt/vol: 1.2548(g)
Date Analyzed: 01/04/2013 00:22
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 20.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76762
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.27	J	0.25	0.19

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30346-1
SDG No.:
Client Sample ID: OC-SB-521-16/18-XXX
Lab Sample ID: 480-30346-3
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/14/2012 08:45
Extraction Method: 3060A
Date Extracted: 01/08/2013 11:55
Sample wt/vol: 1.25(g)
Date Analyzed: 01/09/2013 12:06
Con. Extract Vol.: 50(mL)
Dilution Factor: 100
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 17.7
GPC Cleanup:(Y/N) N
Analysis Batch No.: 77774
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	48	J	2.4	1.8

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30346-1
SDG No.:
Client Sample ID: OC-SB-519-0.0/1.0-XXX
Lab Sample ID: 480-30346-4
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/14/2012 09:00
Extraction Method: 3060A
Date Extracted: 01/03/2013 09:01
Sample wt/vol: 1.2549(g)
Date Analyzed: 01/04/2013 00:48
Con. Extract Vol.: 50(mL)
Dilution Factor: 1000
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 33.8
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76762
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	ND	UJ	30	23

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30346-1
SDG No.:
Client Sample ID: OC-SB-519-8.0/10-XXX
Lab Sample ID: 480-30346-5
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/14/2012 09:20
Extraction Method: 3060A
Date Extracted: 01/03/2013 09:01
Sample wt/vol: 1.2520(g)
Date Analyzed: 01/04/2013 01:00
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7
ID: 4(mm)
% Moisture: 24.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76762
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	0.29	J	0.26	0.20

2/18/13
TC

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine
Job No.: 480-30346-1
SDG No.:
Client Sample ID: OC-SB-519-12/14-XXX
Lab Sample ID: 480-30346-6
Matrix: Solid
Lab File ID: Info 2_TAIIRV167_Hex
Analysis Method: 7199
Date Collected: 12/14/2012 09:40
Extraction Method: 3060A
Date Extracted: 01/03/2013 09:01
Sample wt/vol: 1.2516(g)
Date Analyzed: 01/04/2013 01:38
Con. Extract Vol.: 50(mL)
Dilution Factor: 10
Injection Volume: 1(uL)
GC Column: AS7 ID: 4(mm)
% Moisture: 21.7
GPC Cleanup:(Y/N) N
Analysis Batch No.: 76762
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	2.2	J	0.26	0.19

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine | Job No.: 480-30346-1

SDG No.:

Client Sample ID: OC-SB-518-0.0/1.0-XXX | Lab Sample ID: 480-30346-7

Matrix: Solid | Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199 | Date Collected: 12/14/2012 09:55

Extraction Method: 3060A | Date Extracted: 01/03/2013 09:01

Sample wt/vol: 1.2527(g) | Date Analyzed: 01/04/2013 01:51

Con. Extract Vol.: 50(mL) | Dilution Factor: 1000

Injection Volume: 1(uL) | GC Column: AS7 ID: 4(mm)

% Moisture: 28.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 76762 | Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	ND	UJ	28	21

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine | Job No.: 480-30346-1

SDG No.:

Client Sample ID: OC-SB-518-8.0/10-XXX | Lab Sample ID: 480-30346-8

Matrix: Solid | Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199 | Date Collected: 12/14/2012 10:05

Extraction Method: 3060A | Date Extracted: 01/03/2013 09:01

Sample wt/vol: 1.2510(g) | Date Analyzed: 01/04/2013 02:04

Con. Extract Vol.: 50(mL) | Dilution Factor: 10

Injection Volume: 1(uL) | GC Column: AS7 ID: 4(mm)

% Moisture: 21.0 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 76762 | Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	ND	UJ	0.25	0.19

TC
2/18/13

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Irvine | Job No.: 480-30346-1

SDG No.:

Client Sample ID: OC-SB-518-13/15-XXX | Lab Sample ID: 480-30346-9

Matrix: Solid | Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199 | Date Collected: 12/14/2012 10:15

Extraction Method: 3060A | Date Extracted: 01/03/2013 09:01

Sample wt/vol: 1.2559(g) | Date Analyzed: 01/04/2013 02:16

Con. Extract Vol.: 50(mL) | Dilution Factor: 10

Injection Volume: 1(uL) | GC Column: AS7 ID: 4(mm)

% Moisture: 19.5 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 76762 | Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	36	J	0.25	0.19

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Lab Name: TestAmerica Irvine | Job No.: 480-30346-1

SDG No.:

Client Sample ID: OC-SB-509-0.0/1.0-XXX | Lab Sample ID: 480-30346-10

Matrix: Solid | Lab File ID: Info 2_TAIIRV167_Hex

Analysis Method: 7199 | Date Collected: 12/14/2012 10:45

Extraction Method: 3060A | Date Extracted: 01/08/2013 11:55

Sample wt/vol: 1.24(g) | Date Analyzed: 01/09/2013 09:07

Con. Extract Vol.: 50(mL) | Dilution Factor: 1000

Injection Volume: 1(uL) | GC Column: AS7 ID: 4(mm)

% Moisture: 25.3 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 77774 | Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
18540-29-9	Cr (VI)	ND	UJ	27	20

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SEMIVOLATILE ORGANICS

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

BEHP only

TIER I / II / III (circle one)

SITE: Olin Chemical Superfund Site Project #: 6107130016-10 SDG #: 480-30346-1

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%	
☑	☐	☐	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	
☐	☐	☑	Equipment/Rinseate blank contamination	TIC's removed from data set

Pg 565 see attached

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%)	Surrogated diluted out
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%)	MS/MSD not analyzed w/ this SDG
Field Duplicates ☐ ☐ ☑ RPD criteria met (soils <50%, water <30%)	N/A
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: _____

Date: 2/17/13

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
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TestAmerica Buffalo | Job No.: 480-30346-1

SDG No.:

Client Sample ID: OC-SB-519-0.0/1.0-XXX | Lab Sample ID: 480-30346-4

Matrix: Solid | Lab File ID: X3224.D

Analysis Method: 8270D | Date Collected: 12/14/2012 09:00

Extract. Method: 3546 | Date Extracted: 12/19/2012 09:30

Sample wt/vol: 000030.3(g) | Date Analyzed: 12/21/2012 11:04

Con. Extract Vol.: 1(mL) | Dilution Factor: 10

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

% Moisture: 33.8 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 97046 | Units: ug/Kg

Number TICs Found: 10 | TIC Result Total: 28820

CAS NO.	COMPOUND NAME	RT	RESULT	Q
	~~Unknown~~	~~4.17~~	~~6700~~	~~T J~~
108-38-3	Benzene, 1,3-dimethyl-	4.65	2500	~~T~~ J N
	Unknown	9.61	620	~~T~~ J N
	Unknown	15.06	3200	~~T~~ J N
	Unknown	16.14	640	~~T~~ J N
~~54833-48-6~~	~~Heptadecane, 2,6,10,15-tetramethyl-~~	~~16.69~~	~~760~~	~~T J N~~
26603-23-6	p,p'-Dioctyldiphenylamine	17.00	11000	~~T~~ J N
	Unknown	18.16	620	~~T~~ J N
	Unknown	18.27	880	~~T~~ J N
	Unknown	18.51	1900	~~T~~ J N

FORM I-TIC 8270D

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FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-30346-1
SDG No.:
Client Sample ID: OC-SB-519-8.0/10-XXX
Lab Sample ID: 480-30346-5
Matrix: Solid
Lab File ID: X3207.D
Analysis Method: 8270D
Date Collected: 12/14/2012 09:20
Extract. Method: 3546
Date Extracted: 12/19/2012 09:30
Sample wt/vol: 000030.1(g)
Date Analyzed: 12/20/2012 17:24
Con. Extract Vol.: 1(mL)
Dilution Factor: 1
Injection Volume: 1(uL)
Level: (low/med) Low
% Moisture: 24.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 96803
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
117-81-7	Bis(2-ethylhexyl) phthalate	ND		220	88

CAS NO.	SURROGATE	%REC	Q	LIMITS
118-79-6	2,4,6-Tribromophenol	106		30-130
367-12-4	2-Fluorophenol	96		30-130
4165-60-0	Nitrobenzene-d5	86		30-130
4165-62-2	Phenol-d5	80		30-130
321-60-8	2-Fluorobiphenyl	107		30-130
1718-51-0	p-Terphenyl-d14	94		30-130

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

Lab Name: TestAmerica Buffalo | Job No.: 480-30346-1

SDG No.:

Client Sample ID: OC-SB-519-8.0/10-XXX | Lab Sample ID: 480-30346-5

Matrix: Solid | Lab File ID: X3207.D

Analysis Method: 8270D | Date Collected: 12/14/2012 09:20

Extract. Method: 3546 | Date Extracted: 12/19/2012 09:30

Sample wt/vol: 000030.1(g) | Date Analyzed: 12/20/2012 17:24

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

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

% Moisture: 24.1 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 96803 | Units: ug/Kg

Number TICs Found: 9 | TIC Result Total: 8129

CAS NO.	COMPOUND NAME	RT	RESULT	Q
	~~Unknown~~	~~3.84~~	~~84~~	~~T J~~
	~~Unknown~~	~~4.21~~	~~7500~~	~~T J~~
86-30-6	N-Nitrosodiphenylamine	12.13	44	N J
	Unknown	13.78	64	~~T~~ J N
~~14949-12-3~~	~~5.beta.-Cholest-23-ene, (Z)-~~	~~15.31~~	~~46~~	~~T J N~~
	Unknown	16.41	78	~~T~~ J N
~~7683-64-9~~	~~Squalene~~	~~16.48~~	~~160~~	~~T J N~~
	Unknown	16.69	100	~~T~~ J N
	Unknown	16.98	53	~~T~~ J N

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

Lab Name: TestAmerica Buffalo | Job No.: 480-30346-1

SDG No.:

Client Sample ID: OC-SB-519-12/14-XXX | Lab Sample ID: 480-30346-6

Matrix: Solid | Lab File ID: X3208.D

Analysis Method: 8270D | Date Collected: 12/14/2012 09:40

Extract. Method: 3546 | Date Extracted: 12/19/2012 09:30

Sample wt/vol: 000030.6(g) | Date Analyzed: 12/20/2012 17:49

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

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

% Moisture: 21.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 96803 | Units: ug/Kg

Number TICs Found: 10 | TIC Result Total: 6969

CAS NO.	COMPOUND NAME	RT	RESULT	Q
	Unknown	3.85	77	T J
	Unknown	4.22	6200	~~T~~ J N
	Unknown	4.24	40	~~T~~ J N
	Unknown	13.77	29	~~T~~ J N
	Unknown	15.87	25	~~T~~ J N
	Unknown	16.13	32	~~T~~ J N
	Unknown	16.40	190	~~T~~ J N
7683-64-9	Squalene	16.47	230	T J N
	Unknown	16.68	55	~~T~~ J N
	Unknown	16.99	91	~~T~~ J N

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

Lab Name: TestAmerica Buffalo | Job No.: 480-30346-1

SDG No.:

Client Sample ID: OC-SB-518-0.0/1.0-XXX | Lab Sample ID: 480-30346-7

Matrix: Solid | Lab File ID: X3231.D

Analysis Method: 8270D | Date Collected: 12/14/2012 09:55

Extract. Method: 3546 | Date Extracted: 12/19/2012 09:30

Sample wt/vol: 000030.7(g) | Date Analyzed: 12/21/2012 15:08

Con. Extract Vol.: 1(mL) | Dilution Factor: 500

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

% Moisture: 28.7 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 97046 | Units: ug/Kg

Number TICs Found: 3 | TIC Result Total: 63000

CAS NO.	COMPOUND NAME	RT	RESULT	Q
~~84-74-2~~	~~Dibutyl phthalate~~	~~14.87~~	~~12000~~	~~T J N~~
	Unknown	15.85	17000	~~T~~ J N
	Unknown	16.99	34000	~~T~~ J N

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

Lab Name:	TestAmerica Buffalo	Job No.:	480-30346-1
SDG No.:			
Client Sample ID:	OC-SB-518-8.0/10-XXX	Lab Sample ID:	480-30346-8
Matrix:	Solid	Lab File ID:	X3210.D
Analysis Method:	8270D	Date Collected:	12/14/2012 10:05
Extract. Method:	3546	Date Extracted:	12/19/2012 09:30
Sample wt/vol:	000030.4(g)	Date Analyzed:	12/20/2012 18:40
Con. Extract Vol.:	1(mL)	Dilution Factor:	1
Injection Volume:	1(uL)	Level: (low/med)	Low
% Moisture:	21.0	GPC Cleanup:(Y/N)	N
Analysis Batch No.:	96803	Units:	ug/Kg
Number TICs Found:	10	TIC Result Total:	6189

CAS NO.	COMPOUND NAME	RT	RESULT	Q
	~~Unknown~~	~~3.86~~	~~63~~	~~T J~~
	~~Unknown~~	~~4.22~~	~~4700~~	~~T J~~
	~~Unknown~~	~~4.24~~	~~32~~	~~T J~~
95-47-6	Benzene, 1,2-dimethyl-	4.67	1100	~~T~~ J N
	Unknown	6.35	27	~~T~~ J N
	Unknown	13.78	34	~~T~~ J N
	Unknown	16.14	30	~~T~~ J N
	Unknown	16.41	63	~~T~~ J N
	~~Unknown~~	~~16.47~~	~~100~~	~~T J~~
	Unknown	16.69	40	~~T~~ J N

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

Lab Name: TestAmerica Buffalo | Job No.: 480-30346-1

SDG No.:

Client Sample ID: OC-SB-518-13/15-XXX | Lab Sample ID: 480-30346-9

Matrix: Solid | Lab File ID: X3226.D

Analysis Method: 8270D | Date Collected: 12/14/2012 10:15

Extract. Method: 3546 | Date Extracted: 12/19/2012 09:30

Sample wt/vol: 000030.3(g) | Date Analyzed: 12/21/2012 11:54

Con. Extract Vol.: 1(mL) | Dilution Factor: 20

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

% Moisture: 19.5 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 97046 | Units: ug/Kg

Number TICs Found: 5 | TIC Result Total: 10420

CAS NO.	COMPOUND NAME	RT	RESULT	Q
	~~Unknown~~	~~4.18~~	~~6800~~	~~T J~~
108-38-3	Benzene, 1,3-dimethyl-	4.66	1700	~~T~~ J N
	Unknown	15.07	410	~~T~~ J N
	Unknown	15.88	510	~~T~~ J N
	Unknown	17.01	1000	~~T~~ J N

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