Prepared for:
Tronox LLC
Henderson, Nevada

Data Validation Summary Report
Phase B Source Area Investigation Soil Gas Survey
Tronox LLC Facility, Henderson, Nevada

ENSR Corporation
August 2008
Document No.: 04020-023-4311

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August 25, 2008

Ms. Shannon Harbour, P.E.
Nevada Division of Environmental Protection
2030 East Flamingo Road, Suite 230
Las Vegas, Nevada 89119-0818

Subject: **Data Validation Summary Report Phase B**
Source Area Investigation, Soil Gas Survey
Tronox LLC, Henderson, Nevada

Dear Ms. Harbour:

Enclosed is the *Data Validation Summary Report, Phase B Source Area Investigation, Soil Gas Survey* for the Tronox LLC Henderson Facility.

Please contact me at (702) 651-2234 if you have any comments or questions concerning this correspondence.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

Overnight Mail

Attachment: As stated
CC: See attached Distribution List

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Data Validation Summary Report
Phase B Source Area Investigation Soil Gas Survey
Tronox LLC Henderson, Nevada
August 2008

Responsible CEM for this project

I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and, to the best of my knowledge, comply with all applicable federal, state and local statutes, regulations and ordinances.

SM Crowley 8-25-08

Susan M. Crowley, CEM 1428 exp. date 3/8/09
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Acronyms and Abbreviations

%D	Percent difference or percent drift
%R	Percent recovery
%RSD	Percent relative standard deviation
ASB	Analytical Services Branch
BHC	Hexchlorocyclohexane
CCV	Continuing calibration verification
CDD	Chlorinated Dibenzo-p-Dioxins
CDF	Chlorinated Dibenzofurans
CLP	Contract Laboratory Program
COC	Chain of custody
DCB	Decachlorobiphenyl
DQI	Data quality indicator
DRO	Diesel range organics
EDD	Electronic data deliverables
EMPC	Estimated Maximum Possible Concentrations
EPA	U.S. Environmental Protection Agency
EPN	O-Ethyl-O-p-nitrophenyl benzene thiophosphonate
GC/MS	Gas Chromatography/Mass Spectrometry
GRO	Gasoline range organics
HT	Holding time
ICAL	Initial calibration
ICP	Inductively Coupled Plasma
ICP/MS	Inductively Coupled Plasma/Mass Spectrometry
ICS	Interference check sample
ID	Identification
IS	Internal standard
LCL	Lower control limit
LCS	Laboratory control sample
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MARLAP	Multi-Agency Radiological Laboratory Analytical Protocols Manual
MBAS	Methylene-Blue Active Substances MCL Maximum contaminant levels
MDL	Method detection limit

Acronyms and Abbreviations (Cont'd)

Mn	Manganese
MS/MSD	Matrix spike/matrix spike duplicate
ND	Not detected
NDEP	Nevada Department of Environmental Protection
NFG	National Functional Guidelines
NS	Not spiked
ORO	Oil range organics
PAH	Polycyclic aromatic hydrocarbons
prep	Preparation
PRG	Preliminary Remediation Goals
QAPP	Quality Assurance Project Plan
QC	Quality control
r2	Correlation coefficient
RCRA	Resource Conservation and Recovery Act
RL	Reporting limit
RPD	Relative percent difference
RRF	Relative response factor
SDG	Sample Delivery Group
SRC	Site-Related Chemical
STL	Severn Trent Laboratories
SVOC	Semivolatile organic carbon
TCMX	Tetrachlorometaxylene
TDS	Total dissolved solids
TOC	Total organic carbon
TSS	Total suspended solids
UCL	Upper control limit
VOC	Volatile organic carbon

1.0 Introduction

The purpose of formally validating the Phase B Source Area Investigation Soil Gas Survey laboratory results was to determine the suitability of the data for potential use in the conceptual site model, risk assessment, and other future on-site environmental assessments.

Columbia Analytical Services (hereafter abbreviated as CAS) in Simi Valley, CA was the laboratory contracted by Tronox for the Phase B Source Area Investigation Soil Gas Survey chemical analyses. All analyses utilized EPA Method TO-15.

Attachment A contains the laboratory analytical reports and access® data files (on the report CD). Attachment B contains the data review memos.

2.0 Data Validation Process

The laboratory results for the Phase B Source Area Investigation Soil Gas Survey were subjected to formal data validation following the guidance on data validation provided by the Nevada Division of Environmental Protection (NDEP) for the BMI Plant Sites (NDEP 2006). The data from the laboratory were submitted as Contract Laboratory Program (CLP)-like data packages in PDF format and EQuIS ® format electronic data deliverables (EDDs). The EDDs were imported into an EQuIS ® database specifically created for this project. ENSR validated the data using the hard copy and pdf data packages and subsequently entered the validation qualifiers into the database. Results were compared to the goals stated in the Phase B Source Area Investigation Soil Gas Survey Workplan (ENSR, March 2008), hereafter referred to as the "Workplan," and the Draft Quality Assurance Project Plan (ENSR, April 2008) hereafter referred to as the "QAPP."

A comprehensive ("full") data validation was performed on one of the seven laboratory Sample Delivery Groups (SDGs), and the remainder underwent a more limited validation as described below. The goal of a minimum of 10% full validation that was established for the project was exceeded in order to comprehensively evaluate a full representative SDG. Limited validation consisted of reviewing the following data elements contained in laboratory summary data forms (and did not generally include raw data review):

- Agreement of analyses conducted with chain-of-custody (COC) requests
- Holding times and sample preservation
- Initial and continuing calibrations
- Laboratory method blanks/canister blanks
- Surrogate recoveries
- Internal standard performance
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results
- Laboratory duplicate results
- Field duplicate results
- Quantitation limits and sample results

Full validation consisted of reviewing to the level of raw data all of the elements covered in the limited validation plus the following elements where applicable as defined by the analytical method:

- Mass spectrometer tuning
- Gas Chromatography/Mass Spectrometry (GC/MS) performance checks
- Compound identification
- Peak integration and mass spectral matches
- Calculation and transcription verifications

Analytical data were evaluated with reference to the National Functional Guidelines (NFG; EPA 1999) as well as the Region 9 Superfund Data Evaluation/Validation Guidance (EPA 2001), the above-mentioned NDEP Guidance on Data Validation (NDEP 2006), the EPA reference method, the quality control (QC) criteria specified in the QAPP (ENSR, April 2008), and the Workplan (ENSR, March 2008). The Regional and National Functional Guidelines were modified to accommodate the non-CLP methodologies.

In general, the validation qualifiers and definitions employed were based on those used by the U.S. Environmental Protection Agency (EPA) in the documents mentioned above. Validation qualifiers and definitions are listed in **Table E-1**. A reason code was assigned to all the applications of validation qualifiers for this project. The reason codes and their explanations are listed in **Table E-2**. These codes were entered in the project database for each application of a validation qualifier that changed a laboratory qualifier or modified a result value to indicate the primary reason(s) for data qualification. Where multiple reason codes were assigned to a single result then professional judgment was used to determine the most appropriate overall qualifier and bias sign, if any. Conversions of the laboratory reported "ND" for not detected to the "U" flag in the database and the laboratory-applied "J" qualifier to indicate results less than the reporting limit but greater than the method detection limit (MDL) are generally not discussed in this report. These laboratory qualifiers were standardized and migrated to the validation qualifier field so that the "J" qualifier, unless applied by a validator for other reasons discussed below and documented with a reason code, always indicates a result is estimated because it is less than the reporting limit but greater than the MDL.

Data validation was organized by laboratory report SDG. For each separate SDG a data validation memorandum was written by a validator and reviewed by a peer at ENSR's Westford, MA office. These memoranda are included as Word and Excel documents and sorted by ENSR Identification (ID), which is correlated with the laboratory SDGs, field sample IDs, and collection dates as listed in **Table E-3**. **Table E-3** is provided as an Excel spreadsheet that can be resorted to assist the data user in locating validation information for any particular sample or SDG.

3.0 Data Validation Results

The data validation qualifiers and reason codes were used to indicate all the data in the database where results were qualified as a result of validation. This information was sorted by the QC review elements listed below:

- Holding times and sample preservation
- Initial and continuing calibrations
- Mass spectrometer tuning
- Laboratory blanks/equipment blanks/field blanks
- Surrogate recoveries

- LCS/LCSD results
- Internal standard performance
- Laboratory duplicate results
- Field duplicate results
- Quantitation limits and sample results
- GC/MS performance checks
- Peak integration and mass spectral matches
- Calculation and transcription verifications

Tables E-4 through **E-7** list all the results qualified based on QC problems identified with regard to blank contamination, calibrations, field duplicates, and quantitation problems, respectively. Reason codes for each qualifier assignment have been provided in each table. Where available, a numerical data quality indicator (DQI) result value, and acceptance criteria for that DQI value have been added to the tables in columns to the right of the reason codes per NDEP's request. No QC problems were identified that resulted in qualification of results based on holding times, mass spectrometer tuning, surrogate recoveries, LCS recoveries, internal standard performance, laboratory duplicate results, GC/MS performance checks, compound identification, or peak integration. No results were rejected based on data validation. The data validation summary results table contents are sorted by sample ID and SDG to assist the data user in locating the associated data validation memoranda. The data validation memoranda discuss the application of qualifiers in more detail. **Table E-4** through **Table E-7** are provided on CD as Excel spreadsheets that can be resorted to assist the data user in locating validation information for any particular sample, SDG, method, or analyte. The results in each table will be summarized separately in sections below.

3.1 Instrument Calibration

Table E-5 lists the sample results that were qualified based on exceeded calibration criteria. The nature of the numerical DQI result value is defined by the DQI limit criteria; for instance, percent relative standard deviation (%RSD) criteria are from method initial calibration (ICAL) requirements. The one positive and nine nondetect results for 1,2-dichlorobenzene were qualified as estimated (J and UJ, respectively) due to the associated initial calibration's %RSD for this compound, which slightly exceeded the method defined criteria.

3.2 Blank Contamination

In general, laboratory and field blanks were free of contamination at significant levels. **Table E-4** lists the sample results that were qualified based on contamination in laboratory method blanks. Target compounds were not detected in the canister blanks. The blank result value associated with each qualified sample result is given in the column to the right of the reason codes..

A total of 115 sample results were negated (U) based on the presence of low levels of the common laboratory contaminants methylene chloride, acetone, and 2-butanone, as well as trace levels of benzene, carbon disulfide, ethanol, isopropylbenzene, naphthalene, and vinyl acetate in the method blanks. The majority of these negations were based on the presence of acetone. Table E-4 provides the dilution factors and sample quantitation limits (SQL) to assist the reader in understanding the blank actions. Action limits (AL) were established at 10x the method blank concentration for common lab contaminants and 5x for all other target analytes. If the sample result was < the SQL and < the AL, the result was reported as not detected (U) at the SQL. If the sample result was > SQL but < AL, the result was reported as not detected (U) at the reported concentration. If the sample result was > AL, the result was not qualified.

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3.3 Field Duplicates

The results of all soil gas field duplicate pairs collected were evaluated during validation. RPDs were compared to the objectives established in the QAPP of 50% RPD for soil gas. **Table E-6** lists the results qualified during validation based on field duplicate precision nonconformances.

A total of 84 associated field sample result values in nine sample/field duplicate pairs were qualified as estimated (J) based on field duplicate result RPDs that exceeded the QAPP criteria. Twenty two different analytes and from two to ten records per analyte were qualified.

3.4 Quantitation

Table E-7 lists the results that were qualified during validation based on quantitation issues. All 25 of the qualified results were based on the laboratory qualifier M indicating a possible high bias due to matrix interferences in the GC/MS data. No other quantitation problems were discovered during data validation.

4.0 Evaluation of Data Quality Indicators

Data validation information was used to evaluate the DQIs of precision, accuracy, representativeness, comparability, completeness, and sensitivity for results in the Henderson Phase B Source Area Soil Gas Investigation dataset. Each of these DQI parameters is discussed in the sections below.

4.1 Precision

Precision is the measure of agreement among repeated measurements of the same property under identical or substantially similar conditions. Field precision was assessed through the collection and measurement of field duplicates and expressed as the RPD of the sample and field duplicate pair results. The field duplicate RPD results that caused the application of validation qualifiers are discussed in Section 3.3 of this report and listed in **Table E-6**. In general the field duplicate precision was acceptable for all analytes. A limited analyte data set was qualified as estimated but usable and represents only 1% of the total field sample results dataset.

Laboratory precision was assessed through the RPD results for matrix duplicates. The laboratory duplicate precision was acceptable and no results were qualified during validation.

4.2 Accuracy

Accuracy is the degree of agreement between an observed value and an accepted reference or true value. Laboratory accuracy was assessed during the validation using the recoveries of positive control samples (i.e., LCS and surrogate spikes). All positive control sample recoveries were acceptable and no results were qualified based on LCS or surrogate recoveries.

Accuracy is also indirectly addressed via the negative control samples for field activities, as well as laboratory negative control samples such as method blanks and calibration blanks. Based on blank results validation, 115 results were qualified as described in Section 3.2, which represents only 1.4% of the total data points collected. No data were rejected based on blank results.

Bias as a component of accuracy is also evaluated with the validation of HT, calibration, internal standard performance, and quantitation results. Collectively these evaluations resulted in the qualification of only 0.4% of the total data points. No data were rejected based on these aspects of bias.

Evaluation of the remaining QC elements that contribute to accuracy, such as mass spectrometer tuning, compound or element identification, peak integration and mass spectral matches, and calculation/transcription verifications, did not result in the qualification or rejection of any data points during validation.

4.3 Representativeness

Representativeness is the measure of the degree to which data suitably represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Aspects of representativeness addressed during validation include the review of sample collection information in the COC documentation, conformity of laboratory analyses to Workplan intentions, adherence of the documented laboratory procedures to method requirements, and completeness of the laboratory data packages. Most of the issues identified during this evaluation did not result in the qualification of laboratory data but did involve resubmittals of data from the laboratories to correct problems that were discovered during the validation process. All of these issues were resolved. Other aspects of data representativeness, such as adherence to recommended HTs, instrument calibration requirements, as well as field and laboratory precision assessments, are discussed above in this report.

4.4 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system, expressed as a percentage of the number of valid measurements that were or should have been collected. Valid data are defined as all the data points judged to be usable (i.e., not rejected, as a result of the validation process).

Field completeness is defined as the percentage of samples actually collected versus those intended to be collected per the Workplan. The goal stated in the QAPP for this project was greater than 90% field completeness. A comparison of the Workplan sample tables with the database sample IDs indicates that actual field completeness was 100%, exceeding the goal established for the project. This field completeness calculation is based on the total sample locations scheduled in the Workplan compared to the COC requests sent to the laboratories. All COC requests were faithfully executed by the laboratories with the minor exceptions detailed in the data validation memoranda.

Laboratory completeness is defined as percentage of valid data points versus the total expected from the laboratory analyses. The objective stated in the QAPP for this project was greater than 95% laboratory completeness. Actual laboratory completeness was 100% on the basis of sample analysis (i.e., all requested analyses were performed and reported by the laboratories), and 100% completeness based on valid data.

4.5 Comparability

Comparability is a qualitative expression of the measure of confidence that two or more data sets may contribute to a common analysis. Because this project was an initial site investigation for all of the TO-15 parameters, involving new soil gas sampling locations, there was no well characterized historical data set for comparisons. Comparability of data within the investigation was maximized by using standard methods for sampling and analysis, reporting data, and data validation. A single laboratory performed all the analyses to eliminate interlaboratory variability.

4.6 Sensitivity

Sensitivity is the capability of a method or instrument to discriminate between measurement responses representing different levels of the variable of interest and particularly the capability of measuring a constituent at low levels. For the EPA methods employed in this project, sensitivity is measured by the MDL and reporting limit (RL). Both nominal MDLs and RLs were provided by the laboratories in the laboratory data packages and were verified during validation. Reporting limits in general were adjusted for sample quantitation limits based on the low point of calibration and corrected for sample-specific factors such as exact aliquot size, canister

pressure, dilutions, etc. The laboratories were instructed to report estimated (J flagged) results if concentrations above the MDL but below the RL were detected.

To determine if the adjusted reporting limits for all project analytes were low enough to meet the project sensitivity requirements, a comparison of the project regulatory comparison levels, based on 1/10 of the EPA Region 9 Preliminary Remediation Goals (PRGs) for ambient air, adjusted for vapor intrusion dilution, was made with the nominal laboratory RLs. Risk assessment will be based on the EPA Region VI MSSL values per NDEP request. In general the methods selected were sufficiently sensitive to meet the risk-based comparison level goals in soil gas samples and support potential vapor intrusion evaluation. The RLs and MDLs provided by the laboratories for this analyte set are typical of the TO-15 method employed and significantly lower detection limits are not routinely achievable using certified methods.

5.0 Conclusions

One hundred percent of the laboratory data for the Phase B Source Area Soil Gas Investigation were validated using standardized guidelines and procedures recommended by EPA and NDEP. Ninety seven percent of the results for this project were accepted as reported by the laboratory without additional qualification based on validation actions and should be considered valid for all decision-making purposes.

A subset of the laboratory results was qualified during validation, and those results are summarized in **Tables E-4 to E-7**. The qualified data are grouped in these tables based on the reason for qualification (see **Table E-2**) and the qualifier symbols or flags applied (see **Table E-1**). Three percent of the results of the total analytical dataset for this project were qualified as estimated due to minor QC problems with precision, accuracy, and representativeness. Based on guidance in the EPA data usability document (EPA 1992), estimated data are considered usable with the appropriate interpretation (e.g., consideration of the potential bias). No results were rejected during data validation.

All the qualified results were evaluated with respect to the data quality indicators and compared to the QAPP and Workplan goals. Details of this evaluation are discussed in Section 4 of this report. Based on the results of data validation, the overall goals for data quality were achieved for this project.

6.0 References

EPA. 1992. Guidance for Data Usability in Risk Assessment. Part A.

EPA. 1999. USEPA “Contract Laboratory Program National Functional Guidelines for Organic Data Review.”

EPA. 2001. USEPA “Draft Region 9 Superfund Data Evaluation/Validation Guidance.”

ENSR. March 2008. Phase B Source Area Investigation Soil Gas Survey Workplan, Tronox LLC Facility, Henderson, Nevada.

ENSR. April 2008. Quality Assurance Project Plan, Tronox LLC Facility Henderson, Nevada.

NDEP. 2006. NDEP “Guidance on Data Validation, BMI Pant Sites and Common Areas Projects, Henderson, Nevada.”

TABLES

Table E-1
Data Validation Qualifiers
Phase B Source Area Soil Gas Investigation,
Tronox Facility
Henderson, Nevada

Validation Qualifier	Definition
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity and the result may be biased high.
J-	The result is an estimated quantity and the result may be biased low.
UJ	The analyte was not detected above the sample reporting limit and the reporting limit is approximate.
U	The analyte was analyzed for, but was not detected above the sample reporting limit
R	The result is rejected and unusable due to serious data deficiencies. The presence or absence of the analyte cannot be verified.

Table E-2
Data Validation Qualifier Reason Codes
Phase B Source Area Soil Gas Investigation,
Tronox Facility
Henderson, Nevada

Code	Explanation
a	qualified due to low abundance (radiochemical activity)
b	qualified due to blank contamination
be	qualified due to equipment blank contamination
bf	qualified due to field blank contamination
bl	qualified due to lab blank contamination
c	qualified due to calibration problems
cp	qualified due to insufficient ingrowth (radiochemical only)
fd	qualified due to field duplicate imprecision
h	qualified due to holding time exceedance
i	qualified due to internal standard areas
k	qualified as Estimated Maximum Possible Concentrations (dioxins only)
l	qualified due to LCS recoveries
ld	qualified due to lab duplicate imprecision (matrix duplicate, MSD, LCSD)
m	qualified due to matrix spike recoveries
nb	qualified due to negative lab blank contamination (nondetect results only)
p	qualified as a false positive due to contamination during shipping
q	qualified due to quantitation problem
s	qualified due to surrogate recoveries
x	qualified due to low % solids
y	qualified due to serial dilution results
z	qualified due to ICS results

Table E-3
Sample IDs , SDGs, Lab IDs, and ENSR memo IDs
Phase B Source Area Soil Gas Investigation
Tronox Facility, Henderson Nevada

Sample ID	SDG	Lab ID	ENSR memo ID	Collection Date
SG83B-05-1	P0801342	P0801342-001	TH532	2008-5-7 2:33 PM
SG83B-05-1	P0801342	P0801342-001	TH532	2008-5-7 2:33 PM
SG83B-05-3	P0801342	P0801342-002	TH532	2008-5-7 3:41 PM
SG83B-05-3	P0801342	P0801342-002	TH532	2008-5-7 3:41 PM
SG83B-05-7	P0801342	P0801342-003	TH532	2008-5-7 4:39 PM
SG83B-05-7	P0801342	P0801342-003	TH532	2008-5-7 4:39 PM
SG38B-20	P0801385	P0801385-005	TH533	2008-5-10 9:53 AM
SG40B-05	P0801385	P0801385-006	TH533	2008-5-10 10:51 AM
SG40B-05	P0801385	P0801385-006	TH533	2008-5-10 10:51 AM
SG40B-05D	P0801385	P0801385-007	TH533	2008-5-10 11:18 AM
SG40B-05D	P0801385	P0801385-007	TH533	2008-5-10 11:18 AM
SG41B-20	P0801385	P0801385-002	TH533	2008-5-9 6:30 PM
SG41B-20	P0801385	P0801385-002	TH533	2008-5-9 6:30 PM
SG41B-20D	P0801385	P0801385-003	TH533	2008-5-9 7:12 PM
SG41B-20D	P0801385	P0801385-003	TH533	2008-5-9 7:12 PM
SG43B-05	P0801385	P0801385-004	TH533	2008-5-10 8:20 AM
SG64B-05	P0801385	P0801385-001	TH533	2008-5-9 5:11 PM
SG35B-05	P0801442	P0801442-014	TH534	2008-5-15 1:32 PM
SG36B-20	P0801442	P0801442-004	TH534	2008-5-14 4:25 PM
SG36B-20	P0801442	P0801442-004	TH534	2008-5-14 4:25 PM
SG37B-20	P0801442	P0801442-003	TH534	2008-5-14 5:00 PM
SG39B-05	P0801442	P0801442-002	TH534	2008-5-14 3:20 PM
SG44B-05	P0801442	P0801442-005	TH534	2008-5-14 12:30 PM
SG65B-05	P0801442	P0801442-010	TH534	2008-5-15 8:44 AM
SG65B-05D	P0801442	P0801442-011	TH534	2008-5-15 9:10 AM
SG70B-05	P0801442	P0801442-008	TH534	2008-5-15 9:22 AM
SG70B-05	P0801442	P0801442-008	TH534	2008-5-15 9:22 AM
SG71B-05	P0801442	P0801442-009	TH534	2008-5-15 10:30 AM
SG71B-05	P0801442	P0801442-009	TH534	2008-5-15 10:30 AM
SG72B-05	P0801442	P0801442-007	TH534	2008-5-14 2:02 PM
SG72B-05	P0801442	P0801442-007	TH534	2008-5-14 2:02 PM
SG73B-05	P0801442	P0801442-001	TH534	2008-5-14 2:57 PM
SG75B-05	P0801442	P0801442-018	TH534	2008-5-15 4:29 PM
SG75B-05	P0801442	P0801442-018	TH534	2008-5-15 4:29 PM
SG84B-05	P0801442	P0801442-012	TH534	2008-5-15 10:47 AM
SG84B-05	P0801442	P0801442-012	TH534	2008-5-15 10:47 AM
SG85B-05	P0801442	P0801442-013	TH534	2008-5-15 1:30 PM
SG88B-05	P0801442	P0801442-006	TH534	2008-5-14 1:43 PM
SG89B-05	P0801442	P0801442-017	TH534	2008-5-15 3:52 PM
SG89B-05	P0801442	P0801442-017	TH534	2008-5-15 3:52 PM
SG94B-05	P0801442	P0801442-015	TH534	2008-5-15 2:34 PM
SG95B-05	P0801442	P0801442-016	TH534	2008-5-15 3:09 PM
SG95B-05	P0801442	P0801442-016	TH534	2008-5-15 3:09 PM

Table E-3
Sample IDs , SDGs, Lab IDs, and ENSR memo IDs
Phase B Source Area Soil Gas Investigation
Tronox Facility, Henderson Nevada

Sample ID	SDG	Lab ID	ENSR memo ID	Collection Date
SG07B-05	P0801483	P0801483-027	TH536	2008-5-17 4:20 PM
SG07B-05	P0801483	P0801483-027	TH536	2008-5-17 4:20 PM
SG07B-05D	P0801483	P0801483-028	TH536	2008-5-17 5:05 PM
SG07B-05D	P0801483	P0801483-028	TH536	2008-5-17 5:05 PM
SG08B-05	P0801483	P0801483-023	TH536	2008-5-18 8:44 AM
SG08B-05	P0801483	P0801483-023	TH536	2008-5-18 8:44 AM
SG09B-05	P0801483	P0801483-024	TH536	2008-5-18 7:40 AM
SG09B-05	P0801483	P0801483-024	TH536	2008-5-18 7:40 AM
SG10B-05	P0801483	P0801483-026	TH536	2008-5-18 8:05 AM
SG10B-05	P0801483	P0801483-026	TH536	2008-5-18 8:05 AM
SG11B-05	P0801483	P0801483-025	TH536	2008-5-18 6:55 AM
SG11B-05	P0801483	P0801483-025	TH536	2008-5-18 6:55 AM
SG12B-05	P0801483	P0801483-022	TH536	2008-5-18 6:45 AM
SG12B-05	P0801483	P0801483-022	TH536	2008-5-18 6:45 AM
SG16B-05	P0801483	P0801483-021	TH536	2008-5-18 9:47 AM
SG17B-05	P0801483	P0801483-029	TH536	2008-5-18 10:28 AM
SG18B-05	P0801483	P0801483-030	TH536	2008-5-18 10:55 AM
SG18B-05	P0801483	P0801483-030	TH536	2008-5-18 10:55 AM
SG22B-05	P0801483	P0801483-009	TH536	2008-5-16 12:25 PM
SG22B-05	P0801483	P0801483-009	TH536	2008-5-16 12:25 PM
SG26B-05	P0801483	P0801483-006	TH536	2008-5-16 11:25 AM
SG26B-05	P0801483	P0801483-006	TH536	2008-5-16 11:25 AM
SG26B-05D	P0801483	P0801483-007	TH536	2008-5-16 12:00 PM
SG26B-05D	P0801483	P0801483-007	TH536	2008-5-16 12:00 PM
SG27B-05	P0801483	P0801483-018	TH536	2008-5-16 2:42 PM
SG27B-05	P0801483	P0801483-018	TH536	2008-5-16 2:42 PM
SG28B-05	P0801483	P0801483-011	TH536	2008-5-16 1:53 PM
SG28B-05	P0801483	P0801483-011	TH536	2008-5-16 1:53 PM
SG28B-05D	P0801483	P0801483-008	TH536	2008-5-16 2:16 PM
SG28B-05D	P0801483	P0801483-008	TH536	2008-5-16 2:16 PM
SG32B-05	P0801483	P0801483-019	TH536	2008-5-17 12:00 PM
SG32B-05	P0801483	P0801483-019	TH536	2008-5-17 12:00 PM
SG33B-05	P0801483	P0801483-013	TH536	2008-5-17 3:38 PM
SG61B-05	P0801483	P0801483-015	TH536	2008-5-17 1:38 PM
SG61B-05	P0801483	P0801483-015	TH536	2008-5-17 1:38 PM
SG62B-05	P0801483	P0801483-012	TH536	2008-5-17 2:47 PM
SG62B-05	P0801483	P0801483-012	TH536	2008-5-17 2:47 PM
SG63B-05	P0801483	P0801483-020	TH536	2008-5-17 12:39 PM
SG63B-05	P0801483	P0801483-020	TH536	2008-5-17 12:39 PM
SG76B-05	P0801483	P0801483-001	TH536	2008-5-15 6:00 PM
SG76B-05	P0801483	P0801483-001	TH536	2008-5-15 6:00 PM
SG78B-05	P0801483	P0801483-002	TH536	2008-5-15 5:10 PM
SG78B-05	P0801483	P0801483-002	TH536	2008-5-15 5:10 PM

Table E-3
Sample IDs , SDGs, Lab IDs, and ENSR memo IDs
Phase B Source Area Soil Gas Investigation
Tronox Facility, Henderson Nevada

Sample ID	SDG	Lab ID	ENSR memo ID	Collection Date
SG78B-05	P0801483	P0801483-002	TH536	2008-5-15 5:10 PM
SG79B-05	P0801483	P0801483-004	TH536	2008-5-16 9:44 AM
SG80B-05	P0801483	P0801483-005	TH536	2008-5-16 11:00 AM
SG80B-05	P0801483	P0801483-005	TH536	2008-5-16 11:00 AM
SG81B-05	P0801483	P0801483-003	TH536	2008-5-16 10:24 AM
SG81B-05	P0801483	P0801483-003	TH536	2008-5-16 10:24 AM
SG82B-05	P0801483	P0801483-014	TH536	2008-5-16 9:15 AM
SG82B-05	P0801483	P0801483-014	TH536	2008-5-16 9:15 AM
SG83B-05	P0801483	P0801483-017	TH536	2008-5-17 1:00 PM
SG83B-05	P0801483	P0801483-017	TH536	2008-5-17 1:00 PM
SG83B-05D	P0801483	P0801483-016	TH536	2008-5-17 1:32 PM
SG83B-05D	P0801483	P0801483-016	TH536	2008-5-17 1:32 PM
SG86B-05	P0801483	P0801483-010	TH536	2008-5-16 1:33 PM
SG86B-05	P0801483	P0801483-010	TH536	2008-5-16 1:33 PM
SG06B-05	P0801507	P0801507-015	TH537	2008-5-20 2:53 PM
SG13B-05	P0801507	P0801507-012	TH537	2008-5-20 12:00 PM
SG13B-05	P0801507	P0801507-012	TH537	2008-5-20 12:00 PM
SG14B-05	P0801507	P0801507-014	TH537	2008-5-20 1:50 PM
SG14B-05	P0801507	P0801507-014	TH537	2008-5-20 1:50 PM
SG15B-05	P0801507	P0801507-013	TH537	2008-5-20 1:00 PM
SG15B-05	P0801507	P0801507-013	TH537	2008-5-20 1:00 PM
SG29B-05	P0801507	P0801507-003	TH537	2008-5-19 11:43 AM
SG29B-05	P0801507	P0801507-003	TH537	2008-5-19 11:43 AM
SG30B-05	P0801507	P0801507-002	TH537	2008-5-19 10:35 AM
SG30B-05	P0801507	P0801507-002	TH537	2008-5-19 10:35 AM
SG31B-05	P0801507	P0801507-005	TH537	2008-5-19 2:43 PM
SG31B-05	P0801507	P0801507-005	TH537	2008-5-19 2:43 PM
SG55B-05	P0801507	P0801507-010	TH537	2008-5-20 2:39 PM
SG55B-05	P0801507	P0801507-010	TH537	2008-5-20 2:39 PM
SG56B-05	P0801507	P0801507-008	TH537	2008-5-20 12:48 PM
SG56B-05	P0801507	P0801507-008	TH537	2008-5-20 12:48 PM
SG56B-05D	P0801507	P0801507-009	TH537	2008-5-20 1:31 PM
SG56B-05D	P0801507	P0801507-009	TH537	2008-5-20 1:31 PM
SG57B-05	P0801507	P0801507-011	TH537	2008-5-20 3:58 PM
SG57B-05	P0801507	P0801507-011	TH537	2008-5-20 3:58 PM
SG58B-05	P0801507	P0801507-007	TH537	2008-5-20 11:06 AM
SG58B-05	P0801507	P0801507-007	TH537	2008-5-20 11:06 AM
SG59B-05	P0801507	P0801507-004	TH537	2008-5-19 1:20 PM
SG59B-05	P0801507	P0801507-004	TH537	2008-5-19 1:20 PM
SG60B-05	P0801507	P0801507-006	TH537	2008-5-20 9:24 AM
SG60B-05	P0801507	P0801507-006	TH537	2008-5-20 9:24 AM
SG77B-05	P0801507	P0801507-001	TH537	2008-5-19 9:01 AM
SG77B-05	P0801507	P0801507-001	TH537	2008-5-19 9:01 AM

Table E-3
Sample IDs , SDGs, Lab IDs, and ENSR memo IDs
Phase B Source Area Soil Gas Investigation
Tronox Facility, Henderson Nevada

Sample ID	SDG	Lab ID	ENSR memo ID	Collection Date
SG42B-05	P0801548	P0801548-008	TH538	2008-5-21 7:15 AM
SG45B-05	P0801548	P0801548-017	TH538	2008-5-22 1:28 PM
SG46B-05	P0801548	P0801548-003	TH538	2008-5-21 9:05 AM
SG46B-05	P0801548	P0801548-003	TH538	2008-5-21 9:05 AM
SG47B-05	P0801548	P0801548-011	TH538	2008-5-21 10:45 AM
SG47B-05	P0801548	P0801548-011	TH538	2008-5-21 10:45 AM
SG48B-05	P0801548	P0801548-010	TH538	2008-5-21 9:30 AM
SG49B-05	P0801548	P0801548-014	TH538	2008-5-22 9:36 AM
SG50B-05	P0801548	P0801548-016	TH538	2008-5-22 12:18 PM
SG51B-05	P0801548	P0801548-006	TH538	2008-5-21 1:33 PM
SG51B-05	P0801548	P0801548-006	TH538	2008-5-21 1:33 PM
SG51B-05D	P0801548	P0801548-007	TH538	2008-5-21 2:15 PM
SG51B-05D	P0801548	P0801548-007	TH538	2008-5-21 2:15 PM
SG53B-05	P0801548	P0801548-012	TH538	2008-5-21 1:28 PM
SG53B-05	P0801548	P0801548-012	TH538	2008-5-21 1:28 PM
SG53B-05D	P0801548	P0801548-013	TH538	2008-5-21 1:57 PM
SG53B-05D	P0801548	P0801548-013	TH538	2008-5-21 1:57 PM
SG54B-05	P0801548	P0801548-018	TH538	2008-5-22 1:19 PM
SG54B-05	P0801548	P0801548-018	TH538	2008-5-22 1:19 PM
SG66B-05	P0801548	P0801548-015	TH538	2008-5-22 9:47 AM
SG66B-05	P0801548	P0801548-015	TH538	2008-5-22 9:47 AM
SG67B-05	P0801548	P0801548-005	TH538	2008-5-21 11:07 AM
SG67B-05	P0801548	P0801548-005	TH538	2008-5-21 11:07 AM
SG68B-05	P0801548	P0801548-004	TH538	2008-5-21 10:08 AM
SG69B-05	P0801548	P0801548-009	TH538	2008-5-21 8:19 AM
SG69B-05	P0801548	P0801548-009	TH538	2008-5-21 8:19 AM
SG87B-05	P0801548	P0801548-019	TH538	2008-5-22 12:27 PM
SG91B-05	P0801548	P0801548-001	TH538	2008-5-21 7:00 AM
SG91B-05	P0801548	P0801548-001	TH538	2008-5-21 7:00 AM
SG93B-05	P0801548	P0801548-002	TH538	2008-5-21 7:54 AM
SG93B-05	P0801548	P0801548-002	TH538	2008-5-21 7:54 AM
SG01B-05	P0801656	P0801656-014	TH539	2008-5-29 12:27 PM
SG02B-05	P0801656	P0801656-015	TH539	2008-5-29 1:33 PM
SG03B-05	P0801656	P0801656-013	TH539	2008-5-29 11:12 AM
SG04B-05	P0801656	P0801656-018	TH539	2008-5-29 11:41 AM
SG05B-05	P0801656	P0801656-019	TH539	2008-5-29 1:05 PM
SG19B-05	P0801656	P0801656-008	TH539	2008-5-28 2:42 PM
SG20B-05	P0801656	P0801656-009	TH539	2008-5-28 4:15 PM
SG20B-05	P0801656	P0801656-009	TH539	2008-5-28 4:15 PM
SG21B-05	P0801656	P0801656-005	TH539	2008-5-28 10:08 AM
SG23B-05	P0801656	P0801656-001	TH539	2008-5-28 2:48 PM
SG23B-05	P0801656	P0801656-001	TH539	2008-5-28 2:48 PM
SG24B-05	P0801656	P0801656-006	TH539	2008-5-28 11:26 AM

Table E-3
Sample IDs , SDGs, Lab IDs, and ENSR memo IDs
Phase B Source Area Soil Gas Investigation
Tronox Facility, Henderson Nevada

Sample ID	SDG	Lab ID	ENSR memo ID	Collection Date
SG24B-05	P0801656	P0801656-006	TH539	2008-5-28 11:26 AM
SG25B-05	P0801656	P0801656-002	TH539	2008-5-28 3:52 PM
SG34B-05	P0801656	P0801656-003	TH539	2008-5-28 5:14 PM
SG34B-05	P0801656	P0801656-003	TH539	2008-5-28 5:14 PM
SG42BR-05	P0801656	P0801656-011	TH539	2008-5-29 8:09 AM
SG52B-05	P0801656	P0801656-010	TH539	2008-5-28 5:25 PM
SG52B-05	P0801656	P0801656-010	TH539	2008-5-28 5:25 PM
SG53BR-05	P0801656	P0801656-022	TH539	2008-5-29 6:20 PM
SG53BR-05	P0801656	P0801656-022	TH539	2008-5-29 6:20 PM
SG53BR-05D	P0801656	P0801656-023	TH539	2008-5-29 6:20 PM
SG53BR-05D	P0801656	P0801656-023	TH539	2008-5-29 6:20 PM
SG60BR-05	P0801656	P0801656-017	TH539	2008-5-29 8:40 AM
SG60BR-05	P0801656	P0801656-017	TH539	2008-5-29 8:40 AM
SG65BR-05	P0801656	P0801656-020	TH539	2008-5-29 4:09 PM
SG65BR-05D	P0801656	P0801656-021	TH539	2008-5-29 4:09 PM
SG74B-05	P0801656	P0801656-004	TH539	2008-5-28 6:16 PM
SG90B-05	P0801656	P0801656-007	TH539	2008-5-28 12:32 PM
SG90B-05	P0801656	P0801656-007	TH539	2008-5-28 12:32 PM
SG92B-05	P0801656	P0801656-016	TH539	2008-5-29 10:02 AM
SG92B-05	P0801656	P0801656-016	TH539	2008-5-29 10:02 AM
SG94BR-05	P0801656	P0801656-012	TH539	2008-5-29 9:20 AM

Table E-4
Qualifications Based on Blank Contamination
Phase B Source Area Soil Gas Investigation
Tronox Facility, Henderson Nevada

Sample ID	SDG	Method	Matrix	Analyte	Result	Qualifiers	Units	Reason	Batch ID	MB_Result	Dilution Factor	QL
SG06B-05	P0801507	TO-15	GS	Methylene chloride	0.77	U	ug/m3	b	MS16052708	0.076	1.54	0.77
SG07B-05	P0801483	TO-15	GS	Vinylacetate	8.5	U	ug/m3	b	MS13052708	0.40	1.69	8.5
SG07B-05	P0801483	TO-15	GS	Ethanol	8.5	U	ug/m3	b	MS13052708	1.0	1.69	8.5
SG07B-05	P0801483	TO-15	GS	Acetone	11	U	ug/m3	b	MS13052708	1.8	1.69	8.5
SG07B-05	P0801483	TO-15	GS	2-Butanone	4.5	U	ug/m3	b	MS13052708	0.35	1.69	0.85
SG08B-05	P0801483	TO-15	GS	Vinylacetate	7.5	U	ug/m3	b	MS13052708	0.40	1.49	7.5
SG08B-05	P0801483	TO-15	GS	Acetone	12	U	ug/m3	b	MS13052708	1.8	1.49	7.5
SG10B-05	P0801483	TO-15	GS	Vinylacetate	7.8	U	ug/m3	b	MS13052708	0.40	1.55	7.8
SG10B-05	P0801483	TO-15	GS	Acetone	24	U	ug/m3	b	MS13052708	1.8	1.55	7.8
SG11B-05	P0801483	TO-15	GS	Carbon disulfide	1.4	U	ug/m3	b	MS13052708	0.29	1.47	0.74
SG12B-05	P0801483	TO-15	GS	Vinylacetate	7.7	U	ug/m3	b	MS13052708	0.40	1.54	7.7
SG12B-05	P0801483	TO-15	GS	Carbon disulfide	1.1	U	ug/m3	b	MS13052708	0.29	1.54	0.77
SG12B-05	P0801483	TO-15	GS	Acetone	15	U	ug/m3	b	MS13052708	1.8	1.54	7.7
SG13B-05	P0801507	TO-15	GS	Vinylacetate	32	U	ug/m3	b	MS16052708	0.26	6.44	32
SG13B-05	P0801507	TO-15	GS	Acetone	47	U	ug/m3	b	MS16052708	1.0	6.44	32
SG13B-05	P0801507	TO-15	GS	Methylene chloride	3.2	U	ug/m3	b	MS16052708	0.076	6.44	3.2
SG14B-05	P0801507	TO-15	GS	Methylene chloride	0.97	U	ug/m3	b	MS16052708	0.076	1.63	0.82
SG15B-05	P0801507	TO-15	GS	Methylene chloride	1.6	U	ug/m3	b	MS16052708	0.076	3.26	1.6
SG16B-05	P0801483	TO-15	GS	Vinylacetate	7.9	U	ug/m3	b	MS13052708	0.40	1.57	7.9
SG16B-05	P0801483	TO-15	GS	Ethanol	7.9	U	ug/m3	b	MS13052708	1.0	1.57	7.9
SG16B-05	P0801483	TO-15	GS	Acetone	11	U	ug/m3	b	MS13052708	1.8	1.57	7.9
SG16B-05	P0801483	TO-15	GS	Carbon disulfide	0.90	U	ug/m3	b	MS13052708	0.29	1.57	0.79
SG16B-05	P0801483	TO-15	GS	2-Butanone	4.4	U	ug/m3	b	MS13052708	0.35	1.57	0.79
SG19B-05	P0801656	TO-15	GS	Methylene chloride	1.7	U	ug/m3	b	MS13060708	0.18	1.69	0.85
SG21B-05	P0801656	TO-15	GS	Methylene chloride	0.84	U	ug/m3	b	MS13060708	0.18	1.67	0.84
SG25B-05	P0801656	TO-15	GS	Methylene chloride	0.85	U	ug/m3	b	MS13060708	0.18	1.7	0.85
SG26B-05	P0801483	TO-15	GS	Ethanol	130	U	ug/m3	b	MS13052308	0.12	25.73	130
SG26B-05	P0801483	TO-15	GS	Acetone	130	U	ug/m3	b	MS13052308	0.36	25.73	130
SG26B-05D	P0801483	TO-15	GS	Acetone	49	U	ug/m3	b	MS13052608	0.33	9.7	49
SG27B-05	P0801483	TO-15	GS	Vinylacetate	17	U	ug/m3	b	MS13052708	0.40	3.32	17
SG27B-05	P0801483	TO-15	GS	Ethanol	17	U	ug/m3	b	MS13052708	1.0	3.32	17
SG27B-05	P0801483	TO-15	GS	Carbon disulfide	1.7	U	ug/m3	b	MS13052708	0.29	3.32	1.7

Table E-4
Qualifications Based on Blank Contamination
Phase B Source Area Soil Gas Investigation
Tronox Facility, Henderson Nevada

Sample ID	SDG	Method	Matrix	Analyte	Result	Qualifiers	Units	Reason	Batch ID	MB_Result	Dilution Factor	QL
SG27B-05	P0801483	TO-15	GS	Acetone	17	U	ug/m3	b	MS13052708	1.8	3.32	17
SG27B-05	P0801483	TO-15	GS	2-Butanone	5.0	U	ug/m3	b	MS13052708	0.35	3.32	1.7
SG28B-05	P0801483	TO-15	GS	Acetone	160	U	ug/m3	b	MS13052608	0.33	31.8	160
SG28B-05D	P0801483	TO-15	GS	Acetone	53	U	ug/m3	b	MS13052608	0.33	10.6	53
SG29B-05	P0801507	TO-15	GS	Acetone	830	U	ug/m3	b	MS16052808	0.35	165	830
SG29B-05	P0801507	TO-15	GS	Methylene chloride	83	U	ug/m3	b	MS16052808	0.064	165	83
SG30B-05	P0801507	TO-15	GS	Benzene	15	U	ug/m3	b	MS16052708	0.059	62.4	6.2
SG30B-05	P0801507	TO-15	GS	Acetone	310	U	ug/m3	b	MS16052708	1.0	62.4	310
SG30B-05	P0801507	TO-15	GS	2-Butanone	31	U	ug/m3	b	MS16052708	0.072	62.4	31
SG31B-05	P0801507	TO-15	GS	Acetone	79	U	ug/m3	b	MS16052808	0.35	15.8	79
SG31B-05	P0801507	TO-15	GS	Methylene chloride	7.9	U	ug/m3	b	MS16052808	0.064	15.8	7.9
SG32B-05	P0801483	TO-15	GS	Acetone	160	U	ug/m3	b	MS13052808	0.35	652	3300
SG35B-05	P0801442	TO-15	GS	Acetone	200	U	ug/m3	b	MS13052408	0.19	40	200
SG36B-20	P0801442	TO-15	GS	Acetone	160	U	ug/m3	b	MS13052408	0.19	31.2	160
SG51B-05	P0801548	TO-15	GS	Acetone	400	U	ug/m3	b	MS13060208	0.66	61.2	7.7
SG53B-05	P0801548	TO-15	GS	Acetone	17	U	ug/m3	b	MS13060208	0.66	3.3	17
SG53B-05D	P0801548	TO-15	GS	Acetone	14	U	ug/m3	b	MS13060208	0.66	2.78	14
SG54B-05	P0801548	TO-15	GS	Ethanol	360	U	ug/m3	b	MS13060208	0.093	71.2	360
SG54B-05	P0801548	TO-15	GS	Acetone	360	U	ug/m3	b	MS13060208	0.66	71.2	360
SG55B-05	P0801507	TO-15	GS	Benzene	9.9	U	ug/m3	b	MS16052708	0.059	68	6.8
SG55B-05	P0801507	TO-15	GS	Acetone	340	U	ug/m3	b	MS16052708	1.0	68	340
SG55B-05	P0801507	TO-15	GS	Methylene chloride	34	U	ug/m3	b	MS16052708	0.076	68	34
SG55B-05	P0801507	TO-15	GS	2-Butanone	34	U	ug/m3	b	MS16052708	0.072	68	34
SG56B-05	P0801507	TO-15	GS	Benzene	6.3	U	ug/m3	b	MS16052708	0.059	33.4	3.3
SG56B-05	P0801507	TO-15	GS	Acetone	170	U	ug/m3	b	MS16052708	1.0	33.4	170
SG56B-05	P0801507	TO-15	GS	Methylene chloride	17	U	ug/m3	b	MS16052708	0.076	33.4	17
SG56B-05	P0801507	TO-15	GS	2-Butanone	17	U	ug/m3	b	MS16052708	0.072	33.4	17
SG56B-05D	P0801507	TO-15	GS	Acetone	56	U	ug/m3	b	MS16052808	0.35	11.13	56
SG56B-05D	P0801507	TO-15	GS	Methylene chloride	5.6	U	ug/m3	b	MS16052808	0.064	11.13	5.6
SG57B-05	P0801507	TO-15	GS	Benzene	9.4	U	ug/m3	b	MS16052708	0.059	80.5	8.1
SG57B-05	P0801507	TO-15	GS	Acetone	400	U	ug/m3	b	MS16052708	1.0	80.5	400
SG57B-05	P0801507	TO-15	GS	Methylene chloride	40	U	ug/m3	b	MS16052708	0.076	80.5	40

Table E-4
Qualifications Based on Blank Contamination
Phase B Source Area Soil Gas Investigation
Tronox Facility, Henderson Nevada

Sample ID	SDG	Method	Matrix	Analyte	Result	Qualifiers	Units	Reason	Batch ID	MB_Result	Dilution Factor	QL
SG58B-05	P0801507	TO-15	GS	Acetone	570	U	ug/m3	b	MS16052908	0.55	113.33	570
SG58B-05	P0801507	TO-15	GS	Methylene chloride	57	U	ug/m3	b	MS16052908	0.055	113.33	57
SG59B-05	P0801507	TO-15	GS	Benzene	8.7	U	ug/m3	b	MS16052708	0.059	86.5	8.7
SG59B-05	P0801507	TO-15	GS	Acetone	430	U	ug/m3	b	MS16052708	1.0	86.5	430
SG59B-05	P0801507	TO-15	GS	Methylene chloride	43	U	ug/m3	b	MS16052708	0.076	86.5	43
SG60B-05	P0801507	TO-15	GS	Acetone	1700	U	ug/m3	b	MS16052808	0.35	330	1700
SG60B-05	P0801507	TO-15	GS	Methylene chloride	170	U	ug/m3	b	MS16052808	0.064	330	170
SG60BR-05	P0801656	TO-15	GS	Acetone	1600	U	ug/m3	b	MS13060508	0.19	312	1600
SG61B-05	P0801483	TO-15	GS	Acetone	1600	U	ug/m3	b	MS13052608	0.33	326	1600
SG62B-05	P0801483	TO-15	GS	Acetone	390	U	ug/m3	b	MS13052608	0.33	77	390
SG63B-05	P0801483	TO-15	GS	Ethanol	8.0	U	ug/m3	b	MS13052708	1.0	1.6	8.0
SG63B-05	P0801483	TO-15	GS	Carbon disulfide	0.80	U	ug/m3	b	MS13052708	0.29	1.6	0.80
SG63B-05	P0801483	TO-15	GS	Acetone	10	U	ug/m3	b	MS13052708	1.8	1.6	8.0
SG63B-05	P0801483	TO-15	GS	2-Butanone	3.1	U	ug/m3	b	MS13052708	0.35	1.6	0.80
SG69B-05	P0801548	TO-15	GS	Acetone	1600	U	ug/m3	b	MS13053008	0.16	326	1600
SG70B-05	P0801442	TO-15	GS	Acetone	1600	U	ug/m3	b	MS13052408	0.19	320	1600
SG71B-05	P0801442	TO-15	GS	Acetone	1600	U	ug/m3	b	MS13052408	0.19	322	1600
SG75B-05	P0801442	TO-15	GS	Acetone	110	U	ug/m3	b	MS13052408	0.19	21.87	110
SG76B-05	P0801483	TO-15	GS	Acetone	79	U	ug/m3	b	MS13052308	0.36	15.7	79
SG76B-05	P0801483	TO-15	GS	Naphthalene	1.5	U	ug/m3	b	MS13052308	0.082	15.7	3.1
SG77B-05	P0801507	TO-15	GS	Ethanol	780	U	ug/m3	b	MS16052708	0.082	156	780
SG77B-05	P0801507	TO-15	GS	Acetone	780	U	ug/m3	b	MS16052708	1.0	156	780
SG77B-05	P0801507	TO-15	GS	Methylene chloride	78	U	ug/m3	b	MS16052708	0.076	156	78
SG77B-05	P0801507	TO-15	GS	2-Butanone	78	U	ug/m3	b	MS16052708	0.072	156	78
SG78B-05	P0801483	TO-15	GS	Ethanol	170	U	ug/m3	b	MS13052308	0.12	33	170
SG78B-05	P0801483	TO-15	GS	Acetone	170	U	ug/m3	b	MS13060408	0.13	33	170
SG78B-05	P0801483	TO-15	GS	Acetone	170	U	ug/m3	b	MS13052308	0.36	33	170
SG80B-05	P0801483	TO-15	GS	Ethanol	110	U	ug/m3	b	MS13052308	0.12	21.07	110
SG80B-05	P0801483	TO-15	GS	Acetone	110	U	ug/m3	b	MS13052308	0.36	21.07	110
SG80B-05	P0801483	TO-15	GS	Naphthalene	2.4	U	ug/m3	b	MS13052308	0.082	21.07	4.2
SG81B-05	P0801483	TO-15	GS	Ethanol	76	U	ug/m3	b	MS13052308	0.12	15.2	76
SG81B-05	P0801483	TO-15	GS	Acetone	76	U	ug/m3	b	MS13052308	0.36	15.2	76

Table E-4
Qualifications Based on Blank Contamination
Phase B Source Area Soil Gas Investigation
Tronox Facility, Henderson Nevada

Sample ID	SDG	Method	Matrix	Analyte	Result	Qualifiers	Units	Reason	Batch ID	MB_Result	Dilution Factor	QL
SG82B-05	P0801483	TO-15	GS	Vinylacetate	56	U	ug/m3	b	MS13052708	0.40	11.13	56
SG82B-05	P0801483	TO-15	GS	Ethanol	56	U	ug/m3	b	MS13052708	1.0	11.13	56
SG82B-05	P0801483	TO-15	GS	Acetone	56	U	ug/m3	b	MS13052708	1.8	11.13	56
SG82B-05	P0801483	TO-15	GS	2-Butanone	7.4	U	ug/m3	b	MS13052708	0.35	11.13	5.6
SG83B-05	P0801483	TO-15	GS	Acetone	49	U	ug/m3	b	MS13052808	0.35	181	910
SG83B-05	P0801483	TO-15	GS	2-Butanone	91	U	ug/m3	b	MS13052808	0.074	181	91
SG83B-05-1	P0801342	TO-15	GS	Acetone	820	U	ug/m3	b	MS13050808	0.42	164	820
SG83B-05-1	P0801342	TO-15	GS	Isopropylbenzene	82	U	ug/m3	b	MS13050808	0.060	164	82
SG83B-05-1	P0801342	TO-15	GS	Naphthalene	33	U	ug/m3	b	MS13050808	0.10	164	33
SG83B-05-3	P0801342	TO-15	GS	Acetone	840	U	ug/m3	b	MS13050808	0.42	167	840
SG83B-05-7	P0801342	TO-15	GS	Acetone	870	U	ug/m3	b	MS13050808	0.42	173	870
SG83B-05D	P0801483	TO-15	GS	Ethanol	920	U	ug/m3	b	MS13052708	1.0	184	920
SG83B-05D	P0801483	TO-15	GS	Carbon disulfide	92	U	ug/m3	b	MS13052708	0.29	184	92
SG83B-05D	P0801483	TO-15	GS	Acetone	920	U	ug/m3	b	MS13052708	1.8	184	920
SG84B-05	P0801442	TO-15	GS	Acetone	38	U	ug/m3	b	MS13052408	0.19	7.65	38
SG86B-05	P0801483	TO-15	GS	Acetone	110	U	ug/m3	b	MS13052608	0.33	22.27	110
SG89B-05	P0801442	TO-15	GS	Acetone	1600	U	ug/m3	b	MS13052408	0.19	316	1600
SG94B-05	P0801442	TO-15	GS	Acetone	19	U	ug/m3	b	MS13052408	0.19	3.72	19
SG95B-05	P0801442	TO-15	GS	Acetone	20	U	ug/m3	b	MS13052408	0.19	3.9	20

Note:
Reason codes are defined in Table E-2
Data qualifiers are defined in Table E-1

Table E-5
Qualifications Based on Calibration Criteria Exceedances
Phase B Source Area Soil Gas Investigation
Tronox Facility - Henderson, Nevada

Sample ID	SDG	Method	Matrix	Analyte	Result	Qualifiers	Units	Reason	DQI	DQI Result	DQI Limit
SG38B-20	P0801385	TO-15	GS	1,2-Dichlorobenzene	0.16	UJ	ug/m3	c	ICAL %RSD	30.54%	<30%
SG40B-05	P0801385	TO-15	GS	1,2-Dichlorobenzene	0.16	UJ	ug/m3	c	ICAL %RSD	30.54%	<30%
SG40B-05D	P0801385	TO-15	GS	1,2-Dichlorobenzene	0.16	UJ	ug/m3	c	ICAL %RSD	30.54%	<30%
SG41B-20	P0801385	TO-15	GS	1,2-Dichlorobenzene	0.11	J	ug/m3	c	ICAL %RSD	30.54%	<30%
SG41B-20D	P0801385	TO-15	GS	1,2-Dichlorobenzene	0.16	UJ	ug/m3	c	ICAL %RSD	30.54%	<30%
SG43B-05	P0801385	TO-15	GS	1,2-Dichlorobenzene	0.19	UJ	ug/m3	c	ICAL %RSD	30.54%	<30%
SG64B-05	P0801385	TO-15	GS	1,2-Dichlorobenzene	0.20	UJ	ug/m3	c	ICAL %RSD	30.54%	<30%
SG83B-05-1	P0801342	TO-15	GS	1,2-Dichlorobenzene	16	UJ	ug/m3	c	ICAL %RSD	30.54%	<30%
SG83B-05-3	P0801342	TO-15	GS	1,2-Dichlorobenzene	17	UJ	ug/m3	c	ICAL %RSD	30.54%	<30%
SG83B-05-7	P0801342	TO-15	GS	1,2-Dichlorobenzene	17	UJ	ug/m3	c	ICAL %RSD	30.54%	<30%

Note:
Reason codes are defined in Table E-2
Data qualifiers are defined in Table E-1

Table E-6
Qualifications Based on Field Duplicate Precision
Phase B Source Area Soil Gas Investigation
Tronox Facility,
Henderson, Nevada

Sample ID	SDG	Method	Matrix	Analyte	Result	Qualifiers	Units	Reason	RPD	RPD Limit
SG07B-05	P0801483	TO-15	GS	Ethylbenzene	0.21	J	ug/m3	fd	158	50%
SG07B-05D	P0801483	TO-15	GS	Ethylbenzene	1.8	J	ug/m3	fd	158	50%
SG51B-05	P0801548	TO-15	GS	Ethylbenzene	3.8	J	ug/m3	fd	133	50%
SG51B-05D	P0801548	TO-15	GS	Ethylbenzene	0.77	J	ug/m3	fd	133	50%
SG07B-05	P0801483	TO-15	GS	N-Propylbenzene	0.16	J	ug/m3	fd	138	50%
SG07B-05D	P0801483	TO-15	GS	N-Propylbenzene	0.87	J	ug/m3	fd	138	50%
SG26B-05	P0801483	TO-15	GS	1,4-Dichlorobenzene	4.9	J	ug/m3	fd	111	50%
SG26B-05D	P0801483	TO-15	GS	1,4-Dichlorobenzene	17	J	ug/m3	fd	111	50%
SG40B-05	P0801385	TO-15	GS	1,4-Dichlorobenzene	81	J	ug/m3	fd	84	50%
SG40B-05D	P0801385	TO-15	GS	1,4-Dichlorobenzene	33	J	ug/m3	fd	84	50%
SG51B-05	P0801548	TO-15	GS	1,4-Dichlorobenzene	5.0	J	ug/m3	fd	NC	50%
SG51B-05D	P0801548	TO-15	GS	1,4-Dichlorobenzene	0.62	UJ	ug/m3	fd	NC	50%
SG53B-05	P0801548	TO-15	GS	1,4-Dichlorobenzene	11	J	ug/m3	fd	84	50%
SG53B-05D	P0801548	TO-15	GS	1,4-Dichlorobenzene	4.5	J	ug/m3	fd	84	50%
SG65B-05	P0801442	TO-15	GS	1,4-Dichlorobenzene	78	J	ug/m3	fd	71	50%
SG65B-05D	P0801442	TO-15	GS	1,4-Dichlorobenzene	37	J	ug/m3	fd	71	50%
SG40B-05	P0801385	TO-15	GS	Allyl chloride	5.5	J	ug/m3	fd	NC	50%
SG40B-05D	P0801385	TO-15	GS	Allyl chloride	0.16	UJ	ug/m3	fd	NC	50%
SG07B-05	P0801483	TO-15	GS	1,3,5-Trimethylbenzene	0.24	J	ug/m3	fd	157	50%
SG07B-05D	P0801483	TO-15	GS	1,3,5-Trimethylbenzene	2.0	J	ug/m3	fd	157	50%
SG51B-05	P0801548	TO-15	GS	1,3,5-Trimethylbenzene	5.3	J	ug/m3	fd	NC	50%
SG51B-05D	P0801548	TO-15	GS	1,3,5-Trimethylbenzene	3.1	UJ	ug/m3	fd	NC	50%
SG53BR-05	P0801656	TO-15	GS	1,3,5-Trimethylbenzene	0.40	J	ug/m3	fd	102	50%
SG53BR-05D	P0801656	TO-15	GS	1,3,5-Trimethylbenzene	0.13	J	ug/m3	fd	102	50%
SG51B-05	P0801548	TO-15	GS	Toluene	50	J	ug/m3	fd	63	50%
SG51B-05D	P0801548	TO-15	GS	Toluene	26	J	ug/m3	fd	63	50%
SG65B-05	P0801442	TO-15	GS	Toluene	9.5	J	ug/m3	fd	59	50%
SG65B-05D	P0801442	TO-15	GS	Toluene	5.2	J	ug/m3	fd	59	50%
SG51B-05	P0801548	TO-15	GS	Chlorobenzene	32	J	ug/m3	fd	119	50%
SG51B-05D	P0801548	TO-15	GS	Chlorobenzene	8.1	J	ug/m3	fd	119	50%
SG07B-05	P0801483	TO-15	GS	n-Octane	0.36	J	ug/m3	fd	113	50%

Table E-6
Qualifications Based on Field Duplicate Precision
Phase B Source Area Soil Gas Investigation
Tronox Facility,
Henderson, Nevada

Sample ID	SDG	Method	Matrix	Analyte	Result	Qualifiers	Units	Reason	RPD	RPD Limit
SG07B-05D	P0801483	TO-15	GS	n-Octane	1.3	J	ug/m3	fd	113	50%
SG41B-20	P0801385	TO-15	GS	n-Octane	53	J	ug/m3	fd	55	50%
SG41B-20D	P0801385	TO-15	GS	n-Octane	30	J	ug/m3	fd	55	50%
SG51B-05	P0801548	TO-15	GS	n-Octane	17	J	ug/m3	fd	118	50%
SG51B-05D	P0801548	TO-15	GS	n-Octane	4.4	J	ug/m3	fd	118	50%
SG07B-05	P0801483	TO-15	GS	n-Heptane	0.11	J	ug/m3	fd	160	50%
SG07B-05D	P0801483	TO-15	GS	n-Heptane	1.0	J	ug/m3	fd	160	50%
SG41B-20	P0801385	TO-15	GS	n-Heptane	19	J	ug/m3	fd	62	50%
SG41B-20D	P0801385	TO-15	GS	n-Heptane	10	J	ug/m3	fd	62	50%
SG07B-05	P0801483	TO-15	GS	2-Hexanone	0.32	J	ug/m3	fd	137	50%
SG07B-05D	P0801483	TO-15	GS	2-Hexanone	1.7	J	ug/m3	fd	137	50%
SG07B-05	P0801483	TO-15	GS	4-Ethyltoluene	0.23	J	ug/m3	fd	125	50%
SG07B-05D	P0801483	TO-15	GS	4-Ethyltoluene	1.0	J	ug/m3	fd	125	50%
SG65B-05	P0801442	TO-15	GS	Ethanol	53	J	ug/m3	fd	126	50%
SG65B-05D	P0801442	TO-15	GS	Ethanol	12	J	ug/m3	fd	126	50%
SG51B-05	P0801548	TO-15	GS	Chloromethane	6.5	J	ug/m3	fd	122	50%
SG51B-05D	P0801548	TO-15	GS	Chloromethane	27	J	ug/m3	fd	122	50%
SG53B-05	P0801548	TO-15	GS	Carbon disulfide	1.1	J	ug/m3	fd	177	50%
SG53B-05D	P0801548	TO-15	GS	Carbon disulfide	18	J	ug/m3	fd	177	50%
SG53BR-05	P0801656	TO-15	GS	Carbon disulfide	3.4	J	ug/m3	fd	163	50%
SG53BR-05D	P0801656	TO-15	GS	Carbon disulfide	33	J	ug/m3	fd	163	50%
SG65B-05	P0801442	TO-15	GS	Carbon disulfide	9.0	J	ug/m3	fd	81	50%
SG65B-05D	P0801442	TO-15	GS	Carbon disulfide	3.8	J	ug/m3	fd	81	50%
SG65BR-05	P0801656	TO-15	GS	Carbon disulfide	5.5	J	ug/m3	fd	153	50%
SG65BR-05D	P0801656	TO-15	GS	Carbon disulfide	0.73	J	ug/m3	fd	153	50%
SG40B-05	P0801385	TO-15	GS	1,2-Dichloropropane	1.3	J	ug/m3	fd	131	50%
SG40B-05D	P0801385	TO-15	GS	1,2-Dichloropropane	0.27	J	ug/m3	fd	131	50%
SG51B-05	P0801548	TO-15	GS	Hexachlorobutadiene	2.9	J	ug/m3	fd	NC	50%
SG51B-05D	P0801548	TO-15	GS	Hexachlorobutadiene	0.62	UJ	ug/m3	fd	NC	50%
SG65B-05	P0801442	TO-15	GS	Naphthalene	0.21	J	ug/m3	fd	172	50%
SG65B-05D	P0801442	TO-15	GS	Naphthalene	2.8	J	ug/m3	fd	172	50%

Table E-6
Qualifications Based on Field Duplicate Precision
Phase B Source Area Soil Gas Investigation
Tronox Facility,
Henderson, Nevada

Sample ID	SDG	Method	Matrix	Analyte	Result	Qualifiers	Units	Reason	RPD	RPD Limit
SG07B-05	P0801483	TO-15	GS	o-Xylene	0.47	J	ug/m3	fd	153	50%
SG07B-05D	P0801483	TO-15	GS	o-Xylene	3.5	J	ug/m3	fd	153	50%
SG51B-05	P0801548	TO-15	GS	o-Xylene	9.7	J	ug/m3	fd	177	50%
SG51B-05D	P0801548	TO-15	GS	o-Xylene	0.58	J	ug/m3	fd	177	50%
SG07B-05	P0801483	TO-15	GS	1,2-Dichlorobenzene	0.17	UJ	ug/m3	fd	NC	50%
SG07B-05D	P0801483	TO-15	GS	1,2-Dichlorobenzene	3.7	J	ug/m3	fd	NC	50%
SG51B-05	P0801548	TO-15	GS	1,2-Dichlorobenzene	0.94	J	ug/m3	fd	NC	50%
SG51B-05D	P0801548	TO-15	GS	1,2-Dichlorobenzene	0.62	UJ	ug/m3	fd	NC	50%
SG65B-05	P0801442	TO-15	GS	1,2-Dichlorobenzene	0.38	J	ug/m3	fd	104	50%
SG65B-05D	P0801442	TO-15	GS	1,2-Dichlorobenzene	0.12	J	ug/m3	fd	104	50%
SG07B-05	P0801483	TO-15	GS	1,2,4-Trimethylbenzene	0.80	J	ug/m3	fd	120	50%
SG07B-05D	P0801483	TO-15	GS	1,2,4-Trimethylbenzene	3.2	J	ug/m3	fd	120	50%
SG51B-05	P0801548	TO-15	GS	1,2,4-Trimethylbenzene	4.0	J	ug/m3	fd	NC	50%
SG51B-05D	P0801548	TO-15	GS	1,2,4-Trimethylbenzene	3.1	UJ	ug/m3	fd	NC	50%
SG65B-05	P0801442	TO-15	GS	4-Isopropyltoluene	1.2	J	ug/m3	fd	108	50%
SG65B-05D	P0801442	TO-15	GS	4-Isopropyltoluene	0.36	J	ug/m3	fd	108	50%
SG65BR-05	P0801656	TO-15	GS	4-Isopropyltoluene	0.83	J	ug/m3	fd	146	50%
SG65BR-05D	P0801656	TO-15	GS	4-Isopropyltoluene	0.13	J	ug/m3	fd	146	50%
SG07B-05	P0801483	TO-15	GS	m,p-Xylene	0.96	J	ug/m3	fd	152	50%
SG07B-05D	P0801483	TO-15	GS	m,p-Xylene	7.1	J	ug/m3	fd	152	50%
SG51B-05	P0801548	TO-15	GS	m,p-Xylene	27	J	ug/m3	fd	167	50%
SG51B-05D	P0801548	TO-15	GS	m,p-Xylene	2.4	J	ug/m3	fd	167	50%

Note:
Reason codes are defined in Table E-2
Data qualifiers are defined in Table E-1

Table E-7
Qualification Based on Quantitation Problems
Phase B Source Area Soil Gas Investigation
Tronox Facility Henderson, Nevada

Sample ID	SDG	Method	Matrix	Analyte	Result	Qualifiers	Units	Reason
SG43B-05	P0801385	TO-15	GS	Acetone	34	J+	ug/m3	q
SG85B-05	P0801442	TO-15	GS	Bromodichloromethane	0.96	J+	ug/m3	q
SG07B-05	P0801483	TO-15	GS	N-Butylbenzene	0.39	J+	ug/m3	q
SG07B-05D	P0801483	TO-15	GS	N-Butylbenzene	0.50	J+	ug/m3	q
SG09B-05	P0801483	TO-15	GS	N-Butylbenzene	0.77	J+	ug/m3	q
SG18B-05	P0801483	TO-15	GS	N-Butylbenzene	2.4	J+	ug/m3	q
SG63B-05	P0801483	TO-15	GS	N-Butylbenzene	0.42	J+	ug/m3	q
SG79B-05	P0801483	TO-15	GS	N-Butylbenzene	0.97	J+	ug/m3	q
SG14B-05	P0801507	TO-15	GS	N-Butylbenzene	0.71	J+	ug/m3	q
SG15B-05	P0801507	TO-15	GS	N-Butylbenzene	1.1	J+	ug/m3	q
SG42B-05	P0801548	TO-15	GS	Acetone	38	J+	ug/m3	q
SG47B-05	P0801548	TO-15	GS	Acetone	29	J+	ug/m3	q
SG49B-05	P0801548	TO-15	GS	Acetone	16	J+	ug/m3	q
SG51B-05	P0801548	TO-15	GS	2-Hexanone	2.0	J+	ug/m3	q
SG93B-05	P0801548	TO-15	GS	Acetone	16	J+	ug/m3	q
SG01B-05	P0801656	TO-15	GS	Acetone	33	J+	ug/m3	q
SG04B-05	P0801656	TO-15	GS	Acetone	12	J+	ug/m3	q
SG21B-05	P0801656	TO-15	GS	Acetone	16	J+	ug/m3	q
SG24B-05	P0801656	TO-15	GS	Acetone	18	J+	ug/m3	q
SG25B-05	P0801656	TO-15	GS	Acetone	23	J+	ug/m3	q
SG42BR-05	P0801656	TO-15	GS	Acetone	15	J+	ug/m3	q
SG53BR-05	P0801656	TO-15	GS	Acetone	15	J+	ug/m3	q
SG65BR-05	P0801656	TO-15	GS	Acetone	22	J+	ug/m3	q
SG92B-05	P0801656	TO-15	GS	Acetone	10	J+	ug/m3	q
SG94BR-05	P0801656	TO-15	GS	Acetone	41	J+	ug/m3	q

Note:
Reason codes are defined in Table E-2
Data qualifiers are defined in Table E-1

ATTACHMENT A

Laboratory Analytical Reports and Access® Data Files (on report CD)

ATTACHMENT B

Data Review Memos

ENSR
2 Technology Park Drive, Westford, Massachusetts, 01886-3140
T 978.589.3000 F 978.589.3100 www.ensr.aecom.com

Memorandum

Date: August 6, 2008

To: Mike Flack/Camarillo

From: Waverly Braunstein/Westford

Subject: Data Validation, TO-15 Analysis
Henderson Source Area Phase B Investigation
Tronox LLC Henderson, Nevada
CAS SDG P0801342

Distribution: R. Kennedy/Westford

04020-023-432
TH532to15wwb

SUMMARY

Limited validation was performed on the data for three soil gas samples analyzed for volatile organic compounds (VOCs) using EPA method TO-15. The samples were collected in Summa® canisters at Henderson, NV on May 7, 2008 and submitted to Columbia Analytical Services (CAS), Simi Valley, CA. The data were processed and reported under CAS project number P0801342.

The analytical data were evaluated with reference to EPA Method TO-15, the Region 9 Superfund Data Evaluation/Validation Guidance, NDEP Guidance on Data Validation (5/06), and the quality control (QC) criteria specified in the Quality Assurance Project Plan (QAPP). Validation actions were derived from the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (10/99). Modification of the Functional Guidelines was performed to accommodate the non-CLP methodology.

In general, the data are valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were qualified during validation due to nonconformances to the quality control (QC) acceptance criteria (see discussion below).

SAMPLES

Sample IDs
SG83B-05-1
SG83B-05-3
SG83B-05-7

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REVIEW ELEMENTS

Sample data were reviewed for the following elements:

- Agreement of analyses conducted with chain-of-custody (COC) requests
- Data package completeness
- Holding times
- Initial and continuing calibrations
- Method blanks/canister blanks
- Surrogate spike recoveries
- Internal standard results
- Laboratory control sample (LCS) results
- Field duplicate results
- Laboratory duplicate results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analyses Conducted with COC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC. No discrepancies were noted.

Data Package Completeness

The data package was complete as received.

Holding Times

The samples were analyzed within the method specified holding time.

Initial and Continuing Calibrations

The percent relative standard deviations (%RSDs), and the response factors (RFs) of all target compounds were within the QC acceptance criteria for the initial calibrations associated with the sample analyses with the following exception. Actions were applied as indicated below.

Compound	%RSD	Action (Detects/Nondetects)
1,2-Dichlorobenzene	30.54	Estimate (J)/ Estimate (UJ)
Associated samples: All samples		

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The continuing calibration met the percent difference acceptance criteria.

Method Blanks/Canister Blanks

Several target compounds were detected in the laboratory method blank associated with all sample analyses. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action levels (ALs) were established for acetone at 10x the concentration detected in the laboratory method blank, and at 5x the concentration detected in the method blank for the remaining compounds. The following table summarizes the level of blank contamination detected in the blanks; the action levels; and the associated samples. Blank results and ALs are adjusted by dilution factors before comparison to sample results and quantitation limits.

Method Blank			
Compound	**Concentration ($\mu g/m^3$)**	**AL ($\mu g/m^3$)**	**Associated Samples**
Acetone	0.42	4.2	All samples
Isopropylbenzene	0.06	0.3	
Naphthalene	0.1	0.5	

Sample results were qualified as follows:

- If the sample result was < the sample quantitation limit (SQL) and < the AL, the result was reported as not detected (U) at the SQL.
- If the sample result was > SQL but < AL, the result was reported as not detected (U) at the reported concentration.
- If the sample result was > AL, the result was not qualified.

Target compounds were not detected in the canister blanks.

The samples were collected in canisters verified as clean by the laboratory through routine checks of ten percent of the canisters cleaned. Canister blank certificates are not provided for these samples.

Surrogate Spike Recoveries

Surrogate percent recoveries (%Rs) met the QC acceptance criteria for all samples in this data set.

Internal Standard Results

All internal standard recoveries met the QC acceptance criteria.

LCS Results

The LCS %Rs met the QC acceptance limits of 70-130% for all associated sample analyses.

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Field Duplicate Results

No field duplicates were collected with this sample set. No data validation action is required.

Laboratory Duplicate Results

Laboratory duplicate analysis was performed on sample SG83B-05-07. The RPDs for all target compounds met the QC acceptance criteria.

Quantitation Limits and Sample Results

All samples were analyzed at minor dilutions due to the requirement to pressurize the canisters prior to analysis. Sample results and sample quantitation limits were adjusted accordingly.

In addition, all samples required additional dilution due to target compound concentrations that exceeded the calibration range. The overall dilution factors for these samples are tabulated below.

Sample ID	Total Dilution Factor
SG83B-05-1	164, 1640
SG83B-05-3	167, 1670
SG83B-05-7	173, 1730

The laboratory combined the results from multiple runs to ensure that all results were within the calibration range, and non-detect results were reported at the lowest possible reporting limit. The laboratory did not adjust the reporting limits for these additional dilutions.

Attachments

Summary of qualified data

Summary of Qualified Data
ENSR Data Validation Memo TH532

Sample ID	Compound	Result	Reporting Limit	Units	Lab Qual	Validation Qual	Reason Code
SG83B-05-1	1,2-Dichlorobenzene		16	ug/m3	U	UJ	c
SG83B-05-1	Acetone		820	ug/m3	J, B	U	b
SG83B-05-1	Isopropylbenzene		82	ug/m3	J, B	U	b
SG83B-05-1	Naphthalene		33	ug/m3	J, B	U	b
SG83B-05-3	1,2-Dichlorobenzene		17	ug/m3	U	UJ	c
SG83B-05-3	Acetone		840	ug/m3	J, B	U	b
SG83B-05-7	1,2-Dichlorobenzene		17	ug/m3	U	UJ	c
SG83B-05-7	Acetone		870	ug/m3	J, B	U	b

Note:
Validation qualifiers are defined in Table E-1
Reason codes are defined in Table E-2

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Memorandum

Date: August 12, 2008

To: Mike Flack/Camarillo

From: Waverly Braunstein/Westford

Subject: Data Validation, TO-15 Analysis
Henderson Source Area Phase B Investigation
Tronox LLC Henderson, Nevada
CAS SDG P0801385

Distribution: R. Kennedy/Westford

04020-023-432
TH533to15wwb

SUMMARY

Limited validation was performed on the data for seven soil gas samples analyzed for volatile organic compounds (VOCs) using EPA method TO-15. The samples were collected in Summa® canisters at Henderson, NV on May 9 and 10, 2008 and submitted to Columbia Analytical Services (CAS), Simi Valley, CA. The data were processed and reported under CAS project number P0801385.

The analytical data were evaluated with reference to EPA Method TO-15, the Region 9 Superfund Data Evaluation/Validation Guidance, NDEP Guidance on Data Validation (5/06), and the quality control (QC) criteria specified in the Quality Assurance Project Plan (QAPP). Validation actions were derived from the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (10/99). Modification of the Functional Guidelines was performed to accommodate the non-CLP methodology.

In general, the data are valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were qualified during validation due to nonconformances to the quality control (QC) acceptance criteria (see discussion below).

SAMPLES

Sample IDs
SG38B-20
SG40B-05
SG40B-05D (field duplicate of SG40B-05)
SG41B-20
SG41B-20D (field duplicate of SG41B-20)
SG43B-05
SG64B-05

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REVIEW ELEMENTS

Sample data were reviewed for the following elements:

- Agreement of analyses conducted with chain-of-custody (COC) requests
- Data package completeness
- Holding times
- Initial and continuing calibrations
- Method blanks/canister blanks
- Surrogate spike recoveries
- Internal standard results
- Laboratory control sample (LCS) results
- Field duplicate results
- Laboratory duplicate results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analyses Conducted with COC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC. No discrepancies were noted.

Data Package Completeness

The data package was complete as received.

Holding Times

The samples were analyzed within the method specified holding time.

Initial and Continuing Calibrations

The percent relative standard deviations (%RSDs), and the response factors (RFs) of all target compounds were within the QC acceptance criteria for the initial calibrations associated with the sample analyses with the following exception. Actions were applied as indicated below.

Compound	%RSD	Action (Detects/Nondetects)
1,2-Dichlorobenzene	30.54	Estimate (J)/Estimate (UJ)
Associated samples: All samples		

The continuing calibration met the percent difference acceptance criteria.

Method Blanks/Canister Blanks

Target compounds were not detected in the laboratory method blanks or canister blanks.

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The samples were collected in canisters verified as clean by the laboratory through routine checks of ten percent of the canisters cleaned. Canister blank certificates are not provided for these samples.

Surrogate Spike Recoveries

Surrogate percent recoveries (%Rs) met the QC acceptance criteria for all samples in this data set.

Internal Standard Results

All internal standard recoveries met the QC acceptance criteria.

LCS Results

The LCS %Rs met the QC acceptance limits of 70-130% for all sample analyses.

Field Duplicate Results

Samples SG40B-05/SG40B-05D and SG41B-20/SG41B-20D were submitted as the field duplicate pairs with this sample set. The following tables list the relative percent differences (RPDs) of the detected analytes for each field duplicate pair.

SG40B-05			
Compound	**Original Result ($\mu g/m^3$)**	**Duplicate Result ($\mu g/m^3$)**	**RPD**
Ethylbenzene	2.6	2.8	7
Styrene	0.15 J	0.21 J	33
N-Propylbenzene	0.48 J	0.59 J	21
N-Butylbenzene	0.53	0.28 J	62
1,4-Dichlorobenzene	81	33	84
Allyl chloride	5.5	0.16 U	NC
1,2-Dichloroethane	0.16 U	0.08 J	NC
Vinyl acetate	2.9	1.8	47
4-Methyl-2-pentanone	1.3	1.3	0
1,3,5-Trimethylbenzene	0.66 J	0.67 J	2
Toluene	7	6.9	1
Chlorobenzene	0.44	0.44	0
n-Octane	1.1	1	10
Tetrachloroethene	40	38	5
n-Heptane	0.58 J	0.61 J	5
1,3-Dichlorobenzene	0.16 U	0.12 J	NC
Carbon tetrachloride	26	26	0
2-Hexanone	1.6	1.5	6
4-Ethyltoluene	0.7 J	0.76 J	8
Ethanol	2.5	5.3	72
Acetone	19	13	38
Benzene	4.2	3.1	30
1,1,1-Trichloroethane	2.6	2.6	0
Bromomethane	0.093 J	0.08 J	15
Chloroethane	0.54	0.59	9

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SG40B-05			
Compound	Original Result ($\mu g/m^3$)	Duplicate Result ($\mu g/m^3$)	RPD
Methylene chloride	0.96	1	4
Carbon disulfide	0.92	1	8
Bromodichloromethane	6.3	6.1	3
1,1-Dichloroethane	0.56	0.58	4
1,1-Dichloroethene	0.48	0.48	0
t-Butyl alcohol	0.5 J	0.29 J	53
Trichlorofluoromethane	1.5	1.5	0
Dichlorodifluoromethane	2.3	2.2	4
1,1,2-Trichlorotrifluoroethane	0.51	0.61	18
1,2-Dichlorotetrafluoroethane	0.099 J	0.12 J	19
1,2-Dichloropropane	1.3	0.27	131
2-Butanone	5.8	4.9	17
Trichloroethene	3.3	3.3	0
Hexachlorobutadiene	3.6	3.7	3
Naphthalene	3.2	2.6	21
o-Xylene	3.6	3.7	3
1,2,4-Trimethylbenzene	1.8	1.8	0
Isopropylbenzene	0.14 J	0.14 J	0
4-Isopropyltoluene	0.37 J	0.35 J	6
m,p-Xylene	12	12	0
Chloroform	5000	5000	0

The RPDs for allyl chloride, 1,2-dichloroethane, and 1,3-dichlorobenzene were not calculable (NC) due to a non-detect result in either the original or the duplicate. Precision was deemed acceptable for 1,2-dichloroethane and 1,3-dichlorobenzene since the detected result was less than five times the reporting limit in each case. The detected and non-detected results for allyl chloride in samples SG40B-05 and SG40B-05D were qualified as estimated (J and UJ, respectively) since the detected concentration was greater than five times the reporting limit.

Results for 1,4-dichlorobenzene and 1,2-dichloropropane in samples SG40B-05 and SG40B-05D were qualified as estimated (J) since the RPDs exceeded the acceptance criteria of 50% when both results are greater than five times the reporting limit or 100% when results are greater than five times the reporting limit. All other RPDs met the acceptance criteria.

SG41B-20			
Compound	Original Result ($\mu g/m^3$)	Duplicate Result ($\mu g/m^3$)	RPD
Ethylbenzene	90	87	3
Styrene	1.7	1.9	11
N-Propylbenzene	8.8	9.7	10
N-Butylbenzene	2.7	3	11
1,4-Dichlorobenzene	31	35	12
1,2-Dichloroethane	0.1 J	0.14 J	33
Acrylonitrile	0.25 J	0.31 J	21

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	SG41B-20		
Compound	**Original Result ($\mu g/m^3$)**	**Duplicate Result ($\mu g/m^3$)**	**RPD**
Vinyl acetate	2.3	2.8	20
4-Methyl-2-pentanone	12	14	15
1,3,5-Trimethylbenzene	16	19	17
n-Octane	53	30	55
1,4-Dioxane	0.83 U	0.14 J	NC
Dibromochloromethane	0.17 U	0.12 J	NC
Tetrachloroethene	15	13	14
sec-Butylbenzene	0.91	0.93	2
n-Heptane	19	10	62
cis-1,2-Dichloroethene	0.15 J	0.093 J	47
Methyl tert butyl ether	0.27	0.3	11
Carbon tetrachloride	2.3	2	14
2-Hexanone	0.83 U	3.9	NC
4-Ethyltoluene	14	17	19
Ethanol	5	7.6	41
Acetone	25	26	4
Chloroform	140	110	24
Benzene	35	24	37
Bromomethane	0.1 J	0.16 U	NC
Chloroethane	0.094 J	0.16 U	NC
Methylene chloride	1	1.2	18
Carbon disulfide	13	15	14
Bromodichloromethane	3.4	2.8	19
1,1-Dichloroethane	0.71	0.56	24
1,1-Dichloroethene	6.7	5.4	21
t-Butyl alcohol	0.68 J	0.67 J	1
Trichlorofluoromethane	5.9	5.4	9
Dichlorodifluoromethane	2.3	2.2	4
1,1,2-Trichlorotrifluoroethane	0.57	0.53	7
1,2-Dichlorotetrafluoroethane	0.097 J	0.089 J	9
1,2-Dichloropropane	0.25	0.23	8
2-Butanone	26	28	7
Trichloroethene	4.4	3.6	20
Methyl methacrylate	0.18 J	0.36 J	67
Naphthalene	5.9	7	17
o-Xylene	110	120	9
1,2-Dichlorobenzene	0.11 J	0.16 U	NC
1,2,4-Trimethylbenzene	31	39	23
Isopropylbenzene	3.8	3.7	3
alpha-methyl styrene	0.63 J	0.53 J	17
4-Isopropyltoluene	5.7	6.9	19
Toluene	240	230	4
m,p-Xylene	420	350	18

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The RPDs for 1,4-dioxane, dibromochloromethane, 2-hexanone, bromomethane, chloroethane, and 1,2-dichlorobenzene were NC due to a non-detect result in either the original or the duplicate. Precision was deemed acceptable for each of these compounds since the detected results were less than five times the reporting limit.

Results for n-octane and n-heptane in samples SG41B-20 and SG41B-20D were qualified as estimated (J) since the RPDs exceeded the acceptance criterion of 50% when both results are greater than five times the reporting limit. All other RPDs met the acceptance criteria.

Laboratory Duplicate Results

Laboratory duplicate analysis was performed on sample SG43B-05. The RPDs for all target compounds met the QC acceptance criteria.

Quantitation Limits and Sample Results

All samples were analyzed at minor dilutions due to the requirement to pressurize the canisters prior to analysis. Sample results and sample quantitation limits were adjusted accordingly.

Several samples required additional dilution due to target compound concentrations that exceeded the calibration range. The overall dilution factors for these samples are tabulated below.

Sample ID	Total Dilution Factor
SG40B-05	64
SG40B-05D	62.8
SG41B-20	16.5
SG41B-20D	16.1

The laboratory combined the results from multiple runs to ensure that all results were within the calibration range, and non-detect results were reported at the lowest possible reporting limit. The laboratory did not adjust the reporting limits for these additional dilutions.

The laboratory appended an "M" qualifier to selected results to indicate possible matrix interference due to elution of non-target compounds, leading to a potential high bias in the results. Associated results less than the reporting limit were already flagged with a "J" to indicate an estimated result; in these cases, the "M" qualifier was removed and the "J" qualifier was retained. If the associated result was greater than the reporting limit, the "M" qualifier was replaced with "J+" during validation to indicate an estimated value with possible high bias.

Attachments

Summary of qualified data

Summary of Qualified Data
ENSR Data Validation Memo TH533

Sample ID	Compound	Result	Reporting Limit	Units	Lab Qual	Validation Qual	Reason Code
SG38B-20	1,2-Dichlorobenzene		0.16	ug/m3	U	UJ	c
SG40B-05	1,2-Dichlorobenzene		0.16	ug/m3	U	UJ	c
SG40B-05	1,2-Dichloropropane	1.3	0.16	ug/m3		J	fd
SG40B-05	1,4-Dichlorobenzene	81	0.16	ug/m3		J	fd
SG40B-05	Allyl chloride	5.5	0.16	ug/m3		J	fd
SG40B-05D	1,2-Dichlorobenzene		0.16	ug/m3	U	UJ	c
SG40B-05D	1,2-Dichloropropane	0.27	0.16	ug/m3		J	fd
SG40B-05D	1,4-Dichlorobenzene	33	0.16	ug/m3		J	fd
SG40B-05D	Allyl chloride		0.16	ug/m3	U	UJ	fd
SG41B-20	1,2-Dichlorobenzene	0.11	0.17	ug/m3	J	J	c
SG41B-20	n-Heptane	19	0.83	ug/m3		J	fd
SG41B-20	n-Octane	53	0.83	ug/m3		J	fd
SG41B-20D	1,2-Dichlorobenzene		0.16	ug/m3	U	UJ	c
SG41B-20D	n-Heptane	10	0.81	ug/m3		J	fd
SG41B-20D	n-Octane	30	0.81	ug/m3		J	fd
SG43B-05	1,2-Dichlorobenzene		0.19	ug/m3	U	UJ	c
SG43B-05	Acetone	34	9.7	ug/m3	B, M	J+	q
SG64B-05	1,2-Dichlorobenzene		0.20	ug/m3	U	UJ	c

Note:
Validation qualifiers are defined in Table E-1
Reason codes are defined in Table E-2

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Memorandum

Date: August 12, 2008

To: Mike Flack/Camarillo

From: Waverly Braunstein/Westford

Subject: Data Validation, TO-15 Analysis
Henderson Source Area Phase B Investigation
Tronox LLC Henderson, Nevada
CAS SDG P0801442

Distribution: R. Kennedy/Westford

04020-023-432
TH534to15wwb

SUMMARY

Limited validation was performed on the data for 18 soil gas samples analyzed for volatile organic compounds (VOCs) using EPA method TO-15. The samples were collected in Summa® canisters at Henderson, NV on May 14 and 15, 2008 and submitted to Columbia Analytical Services (CAS), Simi Valley, CA. The data were processed and reported under CAS project number P0801442.

The analytical data were evaluated with reference to EPA Method TO-15, the Region 9 Superfund Data Evaluation/Validation Guidance, NDEP Guidance on Data Validation (5/06), and the quality control (QC) criteria specified in the Quality Assurance Project Plan (QAPP). Validation actions were derived from the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (10/99). Modification of the Functional Guidelines was performed to accommodate the non-CLP methodology.

In general, the data are valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were qualified during validation due to nonconformances to the quality control (QC) acceptance criteria (see discussion below).

SAMPLES

Sample IDs
SG35B-05
SG36B-20
SG37B-20
SG39B-05
SG44B-05
SG65B-05

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Sample IDs
SG65B-05D (field duplicate of SG65B-05)
SG70B-05
SG71B-05
SG72B-05
SG73B-05
SG75B-05
SG84B-05
SG85B-05
SG88B-05
SG89B-05
SG94B-05
SG95B-05

REVIEW ELEMENTS

Sample data were reviewed for the following elements:

- Agreement of analyses conducted with chain-of-custody (COC) requests
- Data package completeness
- Holding times
- Initial and continuing calibrations
- Method blanks/canister blanks
- Surrogate spike recoveries
- Internal standard results
- Laboratory control sample (LCS) results
- Field duplicate results
- Laboratory duplicate results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analyses Conducted with COC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC. No discrepancies were noted.

Data Package Completeness

The data package was complete as received.

The laboratory incorrectly reported the 4-ethyltoluene result for sample SG95B-05 with a "JB" qualifier indicating associated blank contamination. However, 4-ethyltoluene was not found in any of the blanks. The "B" qualifier was removed during validation.

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Holding Times

The samples were analyzed within the method specified holding time.

Initial and Continuing Calibrations

The percent relative standard deviations (%RSDs), and the response factors (RFs) of all target compounds were within the QC acceptance criteria for the initial and continuing calibrations associated with the sample analyses.

Method Blanks/Canister Blanks

Acetone was detected in the laboratory method blank associated with all sample analyses. The presence of blank contamination indicates that false positives may exist for this compound in the associated samples. An action levels (AL) was established for acetone at 10x the concentration detected in the laboratory method blank. The following table summarizes the level of blank contamination detected in the blank; the action level; and the associated samples. Blank results and ALs are adjusted by dilution factors before comparison to sample results and quantitation limits.

Method Blank			
Compound	**Concentration ($\mu g/m^3$)**	**AL ($\mu g/m^3$)**	**Associated Samples**
Acetone	0.19	1.9	All samples

Sample results were qualified as follows:

- If the sample result was < the sample quantitation limit (SQL) and < the AL, the result was reported as not detected (U) at the SQL.
- If the sample result was > SQL but < AL, the result was reported as not detected (U) at the reported concentration.
- If the sample result was > AL, the result was not qualified.

Target compounds were not detected in the canister blanks.

The samples were collected in canisters verified as clean by the laboratory through routine checks of ten percent of the canisters cleaned. Canister blank certificates are not provided for these samples.

Surrogate Spike Recoveries

Surrogate percent recoveries (%Rs) met the QC acceptance criteria for all samples in this data set.

Internal Standard Results

All internal standard recoveries met the QC acceptance criteria.

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LCS Results

The LCS %Rs met the QC acceptance limits of 70-130% for all associated sample analyses.

Field Duplicate Results

Samples SG65B-05/SG65B-05D were submitted as the field duplicate pair with this sample set. The following table lists the relative percent differences (RPDs) of the detected compounds.

SG65B-05			
Compound	**Original Result (ug/m3)**	**Duplicate Result (ug/m3)**	**RPD**
Ethylbenzene	1	0.63 J	45
Styrene	0.78	0.73 U	NC
N-Propylbenzene	0.44 J	0.25 J	55
N-Butylbenzene	0.39	0.29 U	NC
1,4-Dichlorobenzene	78	37	71
Acrylonitrile	0.11 J	0.73 U	NC
Vinyl acetate	7.4 U	2.7 J	NC
4-Methyl-2-pentanone	0.42 J	0.27 J	43
1,3,5-Trimethylbenzene	0.68 J	0.27 J	86
Toluene	9.5	5.2	59
Chlorobenzene	0.093 J	0.15 U	NC
n-Octane	0.36 J	0.16 J	77
1,2,4-Trichlorobenzene	0.15 U	0.24	NC
1,4-Dioxane	0.74 U	0.3 J	NC
Dibromochloromethane	0.26	0.31	18
Tetrachloroethene	2.9	2	37
n-Heptane	0.24 J	0.17 J	34
Methyl tert butyl ether	0.15 U	0.099 J	NC
Carbon tetrachloride	0.44	0.5	13
2-Hexanone	0.44 J	0.34 J	26
4-Ethyltoluene	0.64 J	0.43 J	39
Ethanol	53	12	126
Acetone	27	14	63
Chloroform	6.3	7.5	17
Benzene	2.1	1.8	15
1,1,1-Trichloroethane	0.11 J	0.15 U	NC
Chloromethane	0.11 J	0.15 U	NC
Chloroethane	0.3	0.17	55
Methylene chloride	0.29 J	0.26 J	11
Carbon disulfide	9	3.8	81
Bromoform	0.14 J	0.18 J	25
Bromodichloromethane	0.48	0.55	14
1,1-Dichloroethene	0.087 J	0.074 J	16
t-Butyl alcohol	0.54 J	0.47 J	14
Trichlorofluoromethane	1.2	1.2	0

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SG65B-05			
Compound	Original Result (ug/m3)	Duplicate Result (ug/m3)	RPD
Dichlorodifluoromethane	2	2.1	5
1,1,2-Trichlorotrifluoroethane	0.52	0.51	2
1,2-Dichlorotetrafluoroethane	0.1 J	0.11 J	10
2-Butanone	4.6	3.8	19
Trichloroethene	0.38	0.32	17
Naphthalene	0.21 J	2.8	172
o-Xylene	2.6	1.4	60
1,2-Dichlorobenzene	0.38	0.12 J	104
1,2,4-Trimethylbenzene	1.8	1.1	48
Isopropylbenzene	0.15 J	0.73 U	NC
alpha-Methyl styrene	0.11 J	0.11 J	0
4-Isopropyltoluene	1.2	0.36 J	108
m,p-Xylene	5	2.6	63

The RPDs for styrene, n-butylbenzene, acrylonitrile, vinyl acetate, chlorobenzene, 1,2,4-trichlorobenzene, 1,4-dioxane, methyl tert butyl ether, 1,1,1-trichloroethane, chloromethane, and Isopropylbenzene were not calculable (NC) due to a non-detect result in either the original or the duplicate. Precision was deemed acceptable for each of these compounds since the detected result was less than five times the reporting limit in each case.

Results for 1,4-dichlorobenzene, toluene, ethanol, carbon disulfide, naphthalene, 1,2-dichlorobenzene, and 4-isopropyl toluene in samples SG65B-05 and SG65B-05D were qualified as estimated (J) since the RPDs exceeded the acceptance criteria of 50% when both results are greater than five times the reporting limit or 100% when results are greater than five times the reporting limit. All other RPDs met the acceptance criteria.

Laboratory Duplicate Results

Laboratory duplicate analysis was performed on sample SG35B-05. The RPDs for all target compounds met the QC acceptance criteria.

Quantitation Limits and Sample Results

All samples were analyzed at minor dilutions due to the requirement to pressurize the canisters prior to analysis. Sample results and sample quantitation limits were adjusted accordingly.

In addition, all samples required additional dilution due to target compound concentrations that exceeded the calibration range. All dilution factors associated with reported results are tabulated below.

Sample ID	Dilution Factor
SG35B-05	40
SG36B-20	31
SG36B-20	312
SG37B-20	3.2
SG39B-05	3.3

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Sample ID	Dilution Factor
SG44B-05	1.6
SG65B-05	1.5
SG65B-05D	1.5
SG70B-05	320
SG70B-05	1333
SG71B-05	322
SG71B-05	1610
SG72B-05	1.6
SG72B-05	6.3
SG73B-05	3.2
SG75B-05	22
SG75B-05	109
SG84B-05	7.7
SG84B-05	38
SG85B-05	1.6
SG88B-05	1.7
SG89B-05	316
SG89B-05	1580
SG94B-05	3.7
SG95B-05	3.9
SG95B-05	16

The laboratory combined the results from multiple runs to ensure that all results were within the calibration range, and non-detect results were reported at the lowest possible reporting limit. The laboratory did not adjust the reporting limits for the additional analytical dilutions.

The laboratory appended an "M" qualifier to selected results to indicate possible matrix interference due to elution of non-target compounds, leading to a potential high bias in the results. Associated results less than the reporting limit were already flagged with a "J" to indicate an estimated result; in these cases, the "M" qualifier was removed and the "J" qualifier was retained. If the associated result was greater than the reporting limit, the "M" qualifier was replaced with "J+" during validation to indicate an estimated value with possible high bias.

Attachments

Summary of qualified data

Summary of Qualified Data
ENSR Data Validation Memo TH534

Sample ID	Compound	Result	Reporting Limit	Units	Lab Qual	Validation Qual	Reason Code
SG35B-05	Acetone		200	ug/m3	J, B	U	b
SG36B-20	Acetone		160	ug/m3	J, B	U	b
SG65B-05	1,2-Dichlorobenzene	0.38	0.15	ug/m3		J	fd
SG65B-05	1,4-Dichlorobenzene	78	0.15	ug/m3		J	fd
SG65B-05	4-Isopropyltoluene	1.2	0.74	ug/m3		J	fd
SG65B-05	Carbon disulfide	9.0	0.74	ug/m3		J	fd
SG65B-05	Ethanol	53	7.4	ug/m3		J	fd
SG65B-05	Naphthalene	0.21	0.29	ug/m3	J	J	fd
SG65B-05	Toluene	9.5	0.74	ug/m3		J	fd
SG65B-05D	1,2-Dichlorobenzene	0.12	0.15	ug/m3	J	J	fd
SG65B-05D	1,4-Dichlorobenzene	37	0.15	ug/m3		J	fd
SG65B-05D	4-Isopropyltoluene	0.36	0.73	ug/m3	J	J	fd
SG65B-05D	Carbon disulfide	3.8	0.73	ug/m3		J	fd
SG65B-05D	Ethanol	12	7.3	ug/m3		J	fd
SG65B-05D	Naphthalene	2.8	0.29	ug/m3		J	fd
SG65B-05D	Toluene	5.2	0.73	ug/m3		J	fd
SG70B-05	Acetone		1600	ug/m3	J, B	U	b
SG71B-05	Acetone		1600	ug/m3	J, B	U	b
SG75B-05	Acetone		110	ug/m3	J, B	U	b
SG84B-05	Acetone		38	ug/m3	J, B	U	b
SG85B-05	Bromodichloromethane	0.96	0.16	ug/m3	M	J+	q
SG89B-05	Acetone		1600	ug/m3	J, B	U	b
SG94B-05	Acetone		19	ug/m3	J, B	U	b
SG95B-05	Acetone		20	ug/m3	J, B	U	b

Note:
Validation qualifiers are defined in Table E-1
Reason codes are defined in Table E-2

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Memorandum

Date: August 12, 2008

To: Mike Flack/Camarillo

From: Waverly Braunstein/Westford

Subject: Data Validation, TO-15 Analysis
Henderson Source Area Phase B Investigation
Tronox LLC Henderson, Nevada
CAS SDG P0801483

Distribution: R. Kennedy/Westford

04020-023-432
TH536to15wwb

SUMMARY

Limited validation was performed on the data for 30 soil gas samples analyzed for volatile organic compounds (VOCs) using EPA method TO-15. The samples were collected in Summa® canisters at Henderson, NV on May 15, 16, 17, and 18, 2008 and submitted to Columbia Analytical Services (CAS), Simi Valley, CA. The data were processed and reported under CAS project number P0801483.

The analytical data were evaluated with reference to EPA Method TO-15, the Region 9 Superfund Data Evaluation/Validation Guidance, NDEP Guidance on Data Validation (5/06), and the quality control (QC) criteria specified in the Quality Assurance Project Plan (QAPP). Validation actions were derived from the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (10/99). Modification of the Functional Guidelines was performed to accommodate the non-CLP methodology.

In general, the data are valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were qualified during validation due to nonconformances to the quality control (QC) acceptance criteria (see discussion below).

SAMPLES

Sample IDs	Sample IDs
SG07B-05	SG28B-05D (field duplicate of SG28B-05)
SG07B-05D (field duplicate of SG07B-05)	SG32B-05
SG08B-05	SG33B-05
SG09B-05	SG61B-05
SG10B-05	SG62B-05

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Sample IDs	Sample IDs
SG11B-05	SG63B-05
SG12B-05	SG76B-05
SG16B-05	SG78B-05
SG17B-05	SG79B-05
SG18B-05	SG80B-05
SG22B-05	SG81B-05
SG26B-05	SG82B-05
SG26B-05D (field duplicate of SG26B-05)	SG83B-05
SG27B-05	SG83B-05D (field duplicate of SG83B-05)
SG28B-05	SG86B-05

REVIEW ELEMENTS

Sample data were reviewed for the following elements:

- Agreement of analyses conducted with chain-of-custody (COC) requests
- Data package completeness
- Holding times
- Initial and continuing calibrations
- Method blanks/canister blanks
- Surrogate spike recoveries
- Internal standard results
- Laboratory control sample (LCS) results
- Field duplicate results
- Laboratory duplicate results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analyses Conducted with COC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC.

The laboratory noted that the canister ID for sample SG16B-05 was listed on the COC as SC00539, but the laboratory received canister SC00529, and that the canister ID for sample SG12B-05 was listed on the COC as SC00846, but the laboratory received canister SC00890. No action was taken other than this notation.

The laboratory reported two sets of results for sample SG78B-05. This situation will be described in detail in the laboratory duplicate section below.

No other discrepancies were noted.

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Data Package Completeness

The data package was complete as received.

Holding Times

The samples were analyzed within the method specified holding time.

Initial and Continuing Calibrations

The percent relative standard deviations (%RSDs), and the response factors (RFs) of all target compounds were within the QC acceptance criteria for the initial and continuing calibrations associated with the sample analyses.

Method Blanks/Canister Blanks

Selected target compounds were detected in several laboratory method blanks associated with the sample analyses. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action levels (AL) was established at 10x the concentration detected in the laboratory method blank for the common laboratory contaminants acetone and 2-butanone, and at 5x the concentration detected in the method blank for the remaining compounds. The following table summarizes the level of blank contamination detected in the blanks; the action levels; and the associated samples. Blank results and ALs are adjusted by dilution factors before comparison to sample results and quantitation limits.

Blank ID	Analysis Date	Compound	Conc. ($\mu g/m^3$)	AL ($\mu g/m^3$)	Associated Samples
MS13052308MB	5/23/2008	Acetone	0.36	3.6	SG26B-05, SG76B-05, SG78B-05, SG79B-05, SG80B-05, SG81B-05
		Ethanol	0.12	0.6	
		Naphthalene	0.082	0.41	
MS13052708MB	5/27/2008	2-Butanone	0.35	3.5	SG07B-05, SG08B-05, SG09B-05, SG10B-05, SG11B-05, SG12B-05, SG16B-05, SG22B-05, SG27B-05, SG61B-05, SG62B-05, SG63B-05, SG82B-05, SG83B-05D
		Acetone	1.8	18	
		Carbon disulfide	0.29	1.45	
		Chloroform	0.095	0.475	
		Ethanol	1.0	5	
		Vinylacetate	0.40	2	
MS13052808MB	5/28/2008	2-Butanone	0.074	0.74	SG07B-05, SG07B-05D, SG08B-05, SG09B-05, SG10B-05, SG11B-05, SG12B-05, SG17B-05, SG18B-05, SG27B-05, SG32B-05, SG33B-05, SG63B-05, SG83B-05
		Acetone	0.35	3.5	
MS13052908MB	5/29/2008	Acetone	0.54	5.4	SG18B-05, SG28B-05
MS13060408MB	6/4/2008	Acetone	0.13	1.3	SG20B-05, SG23B-05, SG24B-05, SG34B-05, SG74B-05, SG78B-05, SG90B-05

Sample results were qualified as follows:

- If the sample result was < the sample quantitation limit (SQL) and < the AL, the result was reported as not detected (U) at the SQL.

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- If the sample result was > SQL but < AL, the result was reported as not detected (U) at the reported concentration.
- If the sample result was > AL, the result was not qualified.

Target compounds were not detected in the canister blanks.

The samples were collected in canisters verified as clean by the laboratory through routine checks of ten percent of the canisters cleaned. Canister blank certificates are not provided for these samples.

Surrogate Spike Recoveries

Surrogate percent recoveries (%Rs) met the QC acceptance criteria for all samples in this data set.

Internal Standard Results

All internal standard recoveries met the QC acceptance criteria.

LCS Results

The LCS %Rs met the QC acceptance limits of 70-130% for all sample analyses.

Field Duplicate Results

Samples SG07B-05/SG07B-05D, SG26B-05/SG26B-05D, SG28B-05/SG28B-05D, and SG83B-05/SG83B-05D were submitted as the field duplicate pairs with this sample set. The following tables list the relative percent differences (RPDs) of the detected compounds.

SG07B-05			
Compound	Original Result (ug/m3)	Duplicate Result (ug/m3)	RPD
Ethylbenzene	0.21 J	1.8	158
Styrene	0.17 J	0.13 J	27
N-Propylbenzene	0.16 J	0.87	138
N-Butylbenzene	0.39	0.5	25
1,4-Dichlorobenzene	1.1	0.75	38
Acrylonitrile	0.85 U	0.14 J	NC
Vinyl acetate	8.5 U	6.6 J	NC
4-Methyl-2-pentanone	0.15 J	0.38 J	87
1,3,5-Trimethylbenzene	0.24 J	2	157
Toluene	1	0.99	1
Chlorobenzene	0.18	0.24	29
n-Octane	0.36 J	1.3	113
1,4-Dioxane	0.34 J	0.79 J	80
Dibromochloromethane	0.23	0.19	19
Tetrachloroethene	5.4	5.4	0
sec-Butylbenzene	0.85 U	0.23 J	NC
n-Heptane	0.11 J	1	160
Methyl tert butyl ether	13	13	0

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SG07B-05			
Compound	**Original Result (ug/m3)**	**Duplicate Result (ug/m3)**	**RPD**
1,3-Dichlorobenzene	0.37	0.24	43
Carbon tetrachloride	19	19	0
2-Hexanone	0.32 J	1.7	137
4-Ethyltoluene	0.23 J	1	125
Ethanol	8.5 U	4.9 J	NC
Acetone	11 U	18	NC
Benzene	3.3	2.8	16
1,1,1-Trichloroethane	0.11 J	0.11 J	0
Bromomethane	0.091 J	0.088 J	3
Chloromethane	0.11 J	0.17 U	NC
Chloroethane	1.3	1.3	0
Methylene chloride	2.5	2.4	4
Carbon disulfide	2.9 B	4.7	47
Bromodichloromethane	1.2	1.4	15
1,1-Dichloroethene	0.24	0.23	4
t-Butyl alcohol	0.37 J	0.45 J	20
Trichlorofluoromethane	1.4	1.4	0
Dichlorodifluoromethane	2.1	2	5
1,1,2-Trichlorotrifluoroethane	0.54	0.54	0
2-Butanone	4.5 U	5.4	NC
Trichloroethene	1.8	2.1	15
Naphthalene	0.95	0.87	9
o-Xylene	0.47 J	3.5	153
1,2-Dichlorobenzene	0.17 U	3.7	NC
1,2,4-Trimethylbenzene	0.8 J	3.2	120
Isopropylbenzene	0.85 U	0.41 J	NC
4-Isopropyltoluene	0.2 J	0.56 J	95
m,p-Xylene	0.96	7.1	152
Chloroform	430	420	2

The RPDs for acrylonitrile, sec-butyl benzene, ethanol, acetone, chloromethane, 1,2-dichlorobenzene, vinyl acetate, 2-butanone, and isopropylbenzene were not calculable (NC) due to a non-detect result in either the original or the duplicate. Precision was deemed acceptable for acrylonitrile, sec-butyl benzene, ethanol, acetone, chloromethane, vinyl acetate, 2-butanone, and isopropylbenzene since the detected result was less than five times the reporting limit in each case. Positive and non-detect results for 1,2-dichlorobenzene were qualified as estimated (J and UJ, respectively) in samples SG07B-05 and SG07B-05D since the detected concentration was greater than five times the reporting limit.

Results for ethyl benzene, n-propyl benzene, 1,3,5-trimethylbenzene, n-octane, n-heptane, 2-hexanone, 4-ethyltoluene, o-xylene, m,p-xylene, and 1,2,4-trimethylbenzene in samples SG07B-05 and SG07B-05D were qualified as estimated (J) since the RPDs exceeded the acceptance criteria of

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50% when both results are greater than five times the reporting limit or 100% when results are less than five times the reporting limit. All other RPDs met the acceptance criteria.

SG26B-05			
Compound	Original Result (ug/m3)	Duplicate Result (ug/m3)	RPD
1,4-Dichlorobenzene	4.9	17	111
Vinyl acetate	130 U	2.2 J	NC
Toluene	6.4 J	10	44
Chlorobenzene	2.7	2.6	4
Tetrachloroethene	13	13	0
1,3-Dichlorobenzene	2.6 U	1	NC
Carbon tetrachloride	17	16	6
Ethanol	130 U	3.5 J	NC
Benzene	3.8	2.6	38
Methylene chloride	1.8 J	0.98 J	59
Bromodichloromethane	2.6 U	1.1	NC
1,1-Dichloroethene	3.9	3.1	23
Trichlorofluoromethane	2.6 U	1.1	NC
Dichlorodifluoromethane	2.3 J	2.1 J	9
2-Butanone	4.5 J	3.7 J	20
Trichloroethene	77	76	1
Hexachlorobutadiene	79	69	14
o-Xylene	13 U	1.1 J	NC
1,2-Dichlorobenzene	2.6 U	1.1	NC
m,p-Xylene	13 U	1.6 J	NC
Chloroform	4600	4500	2

The RPDs for vinyl acetate 1,3-dichlorobenzene, ethanol, bromodichloromethane, trichlorofluoromethane, o-xylene, 1,2-dichlorobenzene, and m,p-xylene were NC due to a non-detect result in either the original or the duplicate. Precision was deemed acceptable for each of these compounds since the detected result was less than five times the reporting limit in each case.

Results for 1,4-dichlorobenzene in samples SG26B-05 and SG26B-05D were qualified as estimated (J) since the RPDs exceeded the acceptance criteria of 50% when both results are greater than five times the reporting limit or 100% when results are less than five times the reporting limit. All other RPDs met the acceptance criteria.

SG28B-05			
Compound	Original Result (ug/m3)	Duplicate Result (ug/m3)	RPD
1,4-Dichlorobenzene	11	3.7	99
Vinylacetate	160 U	4.3 J	NC
Toluene	2.1 J	1.9 J	10
Chlorobenzene	3.2 U	1.3	NC

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SG28B-05			
Compound	**Original Result (ug/m3)**	**Duplicate Result (ug/m3)**	**RPD**
Tetrachloroethene	42	41	2
Carbon tetrachloride	24	25	4
Ethanol	5.6 J	3.2 J	55
Benzene	3.7	3.1	18
Methylene chloride	16 U	0.87 J	NC
Carbon disulfide	16 U	2.9 J	NC
Bromodichloromethane	3.2 U	1.5	NC
1,1-Dichloroethane	3.2 U	0.84 J	NC
1,1-Dichloroethene	28	26	7
Trichlorofluoromethane	3.2 U	1.2	NC
Dichlorodifluoromethane	2.1 J	2.1 J	0
2-Butanone	4.4 J	4.3 J	2
Trichloroethene	560	580	4
Naphthalene	2.4 J	1.1 J	74
o-Xylene	16 U	0.92 J	NC
Chloroform	7800	5900	28

The RPDs for vinyl acetate, chlorobenzene, methylene chloride, carbon disulfide, bromodichloromethane, 1,1-dichloroethane, trichlorofluoromethane, and o-xylene were NC due to a non-detect result in either the original or the duplicate. Precision was deemed acceptable for each of these compounds since the detected result was less than five times the reporting limit in each case.

All calculated RPDs met the acceptance criteria of 50% when both results are greater than five times the reporting limit or 100% when results are less than five times the reporting limit.

SG83B-05			
Compound	**Original Result (ug/m3)**	**Duplicate Result (ug/m3)**	**RPD**
1,4-Dichlorobenzene	12 J	18 U	NC
Chlorobenzene	340	330	3
Tetrachloroethene	130	120	8
Carbon tetrachloride	9700	9800	1
Ethanol	32 J	920 U	NC
Benzene	80	79	1
Methylene chloride	10 J	9.6 J	4
Carbon disulfide	37 J	92 U	NC
1,1-Dichloroethane	9.4 J	18 U	NC
Trichlorofluoromethane	1300	1400	7
2-Butanone	16 J	92 U	NC
Trichloroethene	13 J	12 J	8
Naphthalene	20 J	37 U	NC
Chloroform	46000	52000 B	12

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The RPDs for 1,4-dichlorobenzene, ethanol, carbon disulfide, 1,1-dichloroethane, 2-butanone, and naphthalene were NC due to a non-detect result in either the original or the duplicate. Precision was deemed acceptable for each of these compounds since the detected result was less than five times the reporting limit in each case.

All calculated RPDs met the acceptance criteria of 50% when both results are greater than five times the reporting limit or 100% when results are less than five times the reporting limit.

Laboratory Duplicate Results

Laboratory duplicate analyses were performed on samples SG27B-05 and SG78B-05. Precision was deemed acceptable for all compounds in the analysis of sample SG27B-05.

The laboratory initially performed the duplicate analysis of sample SG78B-05 on 5/23/2008. The RPDs for selected compounds exceeded the acceptance criteria so the laboratory reanalyzed the duplicate pair on 6/4/2008. All acceptance criteria were met upon reanalysis. The laboratory reported both sets of results. The validator used professional judgment to report the second set of results. No validation action was required. Note that chloroform is reported from a diluted analysis performed on 5/26/2008.

Quantitation Limits and Sample Results

All samples were analyzed at minor dilutions due to the requirement to pressurize the canisters prior to analysis. Sample results and sample quantitation limits were adjusted accordingly.

In addition, all samples required additional dilution due to target compound concentrations that exceeded the calibration range. All dilution factors associated with reported results are tabulated below.

Sample ID	Dilution Factors
SG07B-05	1.69, 8.45
SG08B-05	1.49, 14.9
SG09B-05	1.65, 16.5
SG10B-05	1.55, 7.75
SG11B-05	1.47, 14.7
SG12B-05	1.54, 7.7
SG16B-05	1.57
SG17B-05	1.63
SG18B-05	1.58, 31.6
SG22B-05	3.16, 63.2
SG26B-05	25.73, 77.2
SG26B-05D	9.7, 77.6
SG27B-05	3.32, 16.6
SG28B-05	31.8, 79.5
SG28B-05D	10.6, 63.6
SG32B-05	652, 3260
SG33B-05	2.22
SG61B-05	326, 1630

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Sample ID	Dilution Factors
SG62B-05	77, 308
SG63B-05	1.6, 8
SG76B-05	15.7, 157
SG78B-05	33, 82.5
SG79B-05	1.53
SG80B-05	21.07, 63.2
SG81B-05	15.2, 30.4
SG82B-05	11.13, 66.8
SG83B-05	181, 1810
SG83B-05D	184, 920
SG86B-05	22.27, 66.8

The laboratory combined the results from multiple runs to ensure that all results were within the calibration range, and non-detect results were reported at the lowest possible reporting limit. The laboratory did not adjust the reporting limits for the additional analytical dilutions.

The laboratory appended an "M" qualifier to selected results to indicate possible matrix interference due to elution of non-target compounds, leading to a potential high bias in the results. Associated results less than the reporting limit were already flagged with a "J" to indicate an estimated result; in these cases, the "M" qualifier was removed and the "J" qualifier was retained. If the associated result was greater than the reporting limit, the "M" qualifier was replaced with "J+" during validation to indicate an estimated value with possible high bias.

Attachments

Summary of qualified data

Summary of Qualified Data
ENSR Data Validation Memo TH536

Sample ID	Compound	Result	Reporting Limit	Units	Lab Qual	Validation Qual	Reason Code
SG07B-05	1,2,4-Trimethylbenzen	0.80	0.85	ug/m3	J	J	fd
SG07B-05	1,2-Dichlorobenzene		0.17	ug/m3	U	UJ	fd
SG07B-05	1,3,5-Trimethylbenzen	0.24	0.85	ug/m3	J	J	fd
SG07B-05	2-Butanone		4.5	ug/m3	B	U	b
SG07B-05	2-Hexanone	0.32	0.85	ug/m3	J	J	fd
SG07B-05	4-Ethyltoluene	0.23	0.85	ug/m3	J	J	fd
SG07B-05	Acetone		11	ug/m3	B	U	b
SG07B-05	Ethanol		8.5	ug/m3	J, B	U	b
SG07B-05	Ethylbenzene	0.21	0.85	ug/m3	J	J	fd
SG07B-05	m,p-Xylene	0.96	0.85	ug/m3		J	fd
SG07B-05	n-Heptane	0.11	0.85	ug/m3	J	J	fd
SG07B-05	n-Octane	0.36	0.85	ug/m3	J	J	fd
SG07B-05	N-Propylbenzene	0.16	0.85	ug/m3	J	J	fd
SG07B-05	o-Xylene	0.47	0.85	ug/m3	J	J	fd
SG07B-05	Vinylacetate		8.5	ug/m3	J, B	U	b
SG07B-05	N-Butylbenzene	0.39	0.34	ug/m3	M	J+	q
SG07B-05D	1,2,4-Trimethylbenzen	3.2	0.85	ug/m3		J	fd
SG07B-05D	1,2-Dichlorobenzene	3.7	0.17	ug/m3		J	fd
SG07B-05D	1,3,5-Trimethylbenzen	2.0	0.85	ug/m3		J	fd
SG07B-05D	2-Hexanone	1.7	0.85	ug/m3		J	fd
SG07B-05D	4-Ethyltoluene	1.0	0.85	ug/m3		J	fd
SG07B-05D	Ethylbenzene	1.8	0.85	ug/m3		J	fd
SG07B-05D	m,p-Xylene	7.1	0.85	ug/m3		J	fd
SG07B-05D	n-Heptane	1.0	0.85	ug/m3		J	fd
SG07B-05D	n-Octane	1.3	0.85	ug/m3		J	fd
SG07B-05D	N-Propylbenzene	0.87	0.85	ug/m3		J	fd
SG07B-05D	o-Xylene	3.5	0.85	ug/m3		J	fd
SG07B-05D	N-Butylbenzene	0.50	0.34	ug/m3	M	J+	q
SG08B-05	Acetone		12	ug/m3	B	U	b
SG08B-05	Vinylacetate		7.5	ug/m3	J, B	U	b
SG09B-05	N-Butylbenzene	0.77	0.33	ug/m3	M	J+	q
SG10B-05	Acetone		24	ug/m3	B	U	b
SG10B-05	Vinylacetate		7.8	ug/m3	J, B	U	b
SG11B-05	Carbon disulfide		1.4	ug/m3	B	U	b
SG12B-05	Acetone		15	ug/m3	B	U	b
SG12B-05	Carbon disulfide		1.1	ug/m3	B	U	b
SG12B-05	Vinylacetate		7.7	ug/m3	J, B	U	b
SG16B-05	2-Butanone		4.4	ug/m3	B	U	b
SG16B-05	Acetone		11	ug/m3	B	U	b
SG16B-05	Carbon disulfide		0.90	ug/m3	B	U	b
SG16B-05	Ethanol		7.9	ug/m3	J, B	U	b
SG16B-05	Vinylacetate		7.9	ug/m3	J, B	U	b
SG18B-05	N-Butylbenzene	2.4	0.32	ug/m3	M	J+	q
SG26B-05	1,4-Dichlorobenzene	4.9	2.6	ug/m3		J	fd
SG26B-05	Acetone		130	ug/m3	J, B	U	b
SG26B-05	Ethanol		130	ug/m3	J, B	U	b
SG26B-05D	1,4-Dichlorobenzene	17	0.97	ug/m3		J	fd
SG26B-05D	Acetone		49	ug/m3	J, B	U	b
SG27B-05	2-Butanone		5.0	ug/m3	B	U	b
SG27B-05	Acetone		17	ug/m3	J, B	U	b

Summary of Qualified Data
ENSR Data Validation Memo TH536

Sample ID	Compound	Result	Reporting Limit	Units	Lab Qual	Validation Qual	Reason Code
SG27B-05	Carbon disulfide		1.7	ug/m3	J, B	U	b
SG27B-05	Ethanol		17	ug/m3	J, B	U	b
SG27B-05	Vinylacetate		17	ug/m3	J, B	U	b
SG28B-05	Acetone		160	ug/m3	J, B	U	b
SG28B-05D	Acetone		53	ug/m3	J, B	U	b
SG32B-05	Acetone		3300	ug/m3	J, B	U	b
SG61B-05	Acetone		1600	ug/m3	J, B	U	b
SG62B-05	Acetone		390	ug/m3	J, B	U	b
SG63B-05	2-Butanone		3.1	ug/m3	B	U	b
SG63B-05	Acetone		10	ug/m3	B	U	b
SG63B-05	Carbon disulfide		0.80	ug/m3	J, B	U	b
SG63B-05	Ethanol		8.0	ug/m3	J, B	U	b
SG63B-05	N-Butylbenzene	0.42	0.32	ug/m3	M	J+	q
SG76B-05	Acetone		79	ug/m3	J, B	U	b
SG76B-05	Naphthalene		3.1	ug/m3	J, B	U	b
SG78B-05	Acetone		170	ug/m3	J, B	U	b
SG79B-05	N-Butylbenzene	0.97	0.31	ug/m3	M	J+	q
SG80B-05	Acetone		110	ug/m3	J, B	U	b
SG80B-05	Ethanol		110	ug/m3	J, B	U	b
SG80B-05	Naphthalene		4.2	ug/m3	J, B	U	b
SG81B-05	Acetone		76	ug/m3	J, B	U	b
SG81B-05	Ethanol		76	ug/m3	J, B	U	b
SG82B-05	2-Butanone		7.4	ug/m3	B	U	b
SG82B-05	Acetone		56	ug/m3	J, B	U	b
SG82B-05	Ethanol		56	ug/m3	J, B	U	b
SG82B-05	Vinylacetate		56	ug/m3	J, B	U	b
SG83B-05	2-Butanone		91	ug/m3	J	U	b
SG83B-05	Acetone		910	ug/m3	J, B	U	b
SG83B-05D	Acetone		920	ug/m3	J, B	U	b
SG83B-05D	Carbon disulfide		92	ug/m3	J, B	U	b
SG83B-05D	Ethanol		920	ug/m3	J, B	U	b
SG86B-05	Acetone		110	ug/m3	J, B	U	b

Note:
Validation qualifiers are defined in Table E-1
Reason codes are defined in Table E-2

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Memorandum

Date: August 12, 2008

To: Mike Flack/Camarillo

From: Waverly Braunstein/Westford

Subject: Data Validation, TO-15 Analysis
Henderson Source Area Phase B Investigation
Tronox LLC Henderson, Nevada
CAS SDG P0801507

Distribution: R. Kennedy/Westford

04020-023-432
TH537to15wwb

SUMMARY

Full validation was performed on the data for 15 soil gas samples analyzed for volatile organic compounds (VOCs) using EPA method TO-15. The samples were collected in Summa® canisters at Henderson, NV on May 19 and 20, 2008 and submitted to Columbia Analytical Services (CAS), Simi Valley, CA. The data were processed and reported under CAS project number P0801507.

The analytical data were evaluated with reference to EPA Method TO-15, the Region 9 Superfund Data Evaluation/Validation Guidance, NDEP Guidance on Data Validation (5/06), and the quality control (QC) criteria specified in the Quality Assurance Project Plan (QAPP). Validation actions were derived from the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (10/99). Modification of the Functional Guidelines was performed to accommodate the non-CLP methodology.

In general, the data are valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were qualified during validation due to nonconformances to the quality control (QC) acceptance criteria (see discussion below).

SAMPLES

Sample IDs	Sample IDs
SG06B-05	SG56B-05
SG13B-05	SG56B-05D (field duplicate of SG56B-05)
SG14B-05	SG57B-05
SG15B-05	SG58B-05
SG29B-05	SG59B-05
SG30B-05	SG60B-05
SG31B-05	SG77B-05

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Sample IDs	Sample IDs
SG55B-05	

REVIEW ELEMENTS

Sample data were reviewed for the following elements:

- Agreement of analyses conducted with chain-of-custody (COC) requests
- Data package completeness
- Holding times
- GC/MS Tuning
- Initial and continuing calibrations
- Method blanks/canister blanks
- Surrogate spike recoveries
- Internal standard results
- Laboratory control sample (LCS) results
- Field duplicate results
- Laboratory duplicate results
- Target compound identification
- Quantitation limits and sample results

DISCUSSION

Agreement of Analyses Conducted with COC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC. No discrepancies were noted.

Data Package Completeness

The data package was complete as received.

Holding Times

The samples were analyzed within the method specified holding time.

Instrument Tuning

All bromofluorobenzene instrument tune checks met the acceptance criteria. The samples were analyzed within 24 hours of a tune check.

Initial and Continuing Calibrations

The percent relative standard deviations (%RSDs), and the response factors (RFs) of all target compounds were within the QC acceptance criteria for the initial and continuing calibrations associated with the sample analyses.

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Method Blanks/Canister Blanks

Selected target compounds were detected in several laboratory method blanks associated with the sample analyses. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action levels (ALs) were established at 10x the concentration detected in the laboratory method blank for the common laboratory contaminants acetone and 2-butanone, and at 5x the concentration detected in the method blank for the remaining compounds. The following table summarizes the level of blank contamination detected in the blanks; the ALs; and the associated samples. Blank results and ALs are adjusted by dilution factors before comparison to sample results and quantitation limits.

Blank ID	Analysis Date	Compound	Conc. ($\mu g/m^3$)	AL ($\mu g/m^3$)	Associated Samples
MS16052708MB	5/27/2008	2-Butanone	0.072	0.72	SG06B-05, SG13B-05, SG14B-05, SG15B-05, SG30B-05, SG31B-05, SG55B-05, SG56B-05, SG56B-05D, SG57B-05, SG59B-05, SG77B-05
		Acetone	1.0	10	
		Benzene	0.059	0.295	
		Ethanol	0.082	0.41	
		Methylene chloride	0.076	0.76	
		Vinyl acetate	0.26	1.3	
MS16052808MB	5/28/2008	Acetone	0.35	3.5	SG29B-05, SG30B-05, SG31B-05, SG55B-05, SG56B-05D, SG57B-05, SG59B-05, SG60B-05
		Chloroform	0.090	0.45	
		Methylene chloride	0.064	0.64	
MS16052908MB	5/29/2008	Acetone	0.55	5.5	SG29B-05, SG58B-05
		Chloroform	0.087	0.435	
		Ethanol	0.062	0.31	
		Methylene chloride	0.055	0.55	

Sample results were qualified as follows:

- If the sample result was < the sample quantitation limit (SQL) and < the AL, the result was reported as not detected (U) at the SQL.
- If the sample result was > SQL but < AL, the result was reported as not detected (U) at the reported concentration.
- If the sample result was > AL, the result was not qualified.

Target compounds were not detected in the canister blanks.

The samples were collected in canisters verified as clean by the laboratory through routine checks of ten percent of the canisters cleaned. Canister blank certificates are not provided for these samples.

Surrogate Spike Recoveries

Surrogate percent recoveries (%Rs) met the QC acceptance criteria for all samples in this data set.

Internal Standard Results

All internal standard recoveries met the QC acceptance criteria.

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LCS Results

The LCS %Rs met the QC acceptance limits of 70-130% for all sample analyses.

Field Duplicate Results

Samples SG56B-05/SG56B-05D were submitted as the field duplicate pair with this sample set. The following tables list the relative percent differences (RPDs) of the detected analytes for the field duplicate pair.

SG56B-05			
Compound	Original Result ($\mu g/m^3$)	Duplicate Result ($\mu g/m^3$)	RPD
Chloroform	7500	7700	2.6
Ethylbenzene	8.9 J	11	21
N-Propylbenzene	17 U	1.2 J	NC
1,4-Dichlorobenzene	3.3 U	0.97 J	NC
1,2-Dichloroethane	3.3 U	1 J	NC
4-Methyl-2-pentanone	17 U	1.9 J	NC
1,3,5-Trimethylbenzene	3.6 J	4.7 J	27
Toluene	32	35	9.0
Chlorobenzene	3.3 U	0.81 J	NC
n-Octane	26	27	3.8
Tetrachloroethene	31	30	3.3
n-Heptane	17 U	1.1 J	NC
1,3-Dichlorobenzene	4.3	4.3	0
Carbon tetrachloride	210	220	4.7
2-Hexanone	17 U	1 J	NC
4-Ethyltoluene	17 U	2.4 J	NC
Ethanol	170 U	1.4 J	NC
Benzene	6.3 U	4.8	NC
Carbon disulfide	17 U	3.5 J	NC
Bromodichloromethane	3.3 U	2.1	44
1,1-Dichloroethane	7.2	7.5	4.1
1,1-Dichloroethene	3.3 U	0.87 J	NC
Trichlorofluoromethane	56	57	1.8
Dichlorodifluoromethane	17 U	2.2 J	NC
2-Butanone	7.4 J	4.5 J	49
Trichloroethene	3.3 U	0.98 J	NC
Naphthalene	6.7 U	1.2 J	NC
o-Xylene	17 J	20	16
1,2,4-Trimethylbenzene	5.2 J	8	42
m,p-Xylene	47	56	17

The RPDs for n-propylbenzene, 1,4-dichlorobenzene, 1,2-dichloroethane, 4-methyl-2-pentanone, chlorobenzene, n-heptane, 2-hexanone, 4-ethyltoluene, ethanol, benzene, carbon disulfide, bromodichloromethane, 1,1-dichloroethene, dichlorodifluoromethane, trichloroethene, and naphthalene were NC due to a non-detect result in either the original or the duplicate. Precision was

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deemed acceptable for each of these compounds since the detected result was less than five times the reporting limit in each case.

All calculated RPDs met the acceptance criteria of 50% when both results are greater than five times the reporting limit or 100% when results are less than five times the reporting limit.

Laboratory Duplicate Results

Laboratory duplicate analysis was performed on sample SG56B-05. The RPDs for all target compounds met the QC acceptance criteria.

Target Compound Identification

Target compound identification was spot checked. Target compounds were within appropriate retention time windows, and spectral identification was acceptable.

Quantitation Limits and Sample Results

All samples were analyzed at minor dilutions due to the requirement to pressurize the canisters prior to analysis. Sample results and sample quantitation limits were adjusted accordingly.

In addition, most samples required additional dilution due to target compound concentrations that exceeded the calibration range. All dilution factors associated with reported results are tabulated below.

Sample ID	Dilution Factors
SG06B-05	1.54
SG13B-05	6.44, 32.2
SG14B-05	1.63, 16.3
SG15B-05	3.26, 32.6
SG29B-05	165, 1650
SG30B-05	62.4, 780
SG31B-05	15.8, 79
SG55B-05	68, 340
SG56B-05	33.4, 83.5
SG56B-05D	11.1, 83.5
SG57B-05	80.5, 805
SG58B-05	113, 850
SG59B-05	86.5, 865
SG60B-05	330, 1650
SG77B-05	156, 780

The laboratory combined the results from multiple runs to ensure that all results were within the calibration range, and non-detect results were reported at the lowest possible reporting limit. The laboratory did not adjust the reporting limits for the additional analytical dilutions.

Note that the actual concentrations of the calibrations vary slightly from the nominal concentrations. For example, the actual concentration of compounds in the 0.1 ng standard may range from 0.091 to 0.131, meaning that for those compounds with a nominal reporting limit of 0.10 µg/m3, the true value of the

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associated reporting limit may be slightly higher. In all cases, the reporting limit is within 30% of the lowest calibration standard. No validation action was taken other than this notation.

The laboratory appended an "M" qualifier to selected results to indicate possible matrix interference due to elution of non-target compounds, leading to a potential high bias in the results. Associated results less than the reporting limit were already flagged with a "J" to indicate an estimated result; in these cases, the "M" qualifier was removed and the "J" qualifier was retained. If the associated result was greater than the reporting limit, the "M" qualifier was replaced with "J+" during validation to indicate an estimated value with possible high bias.

Attachments

Summary of qualified data

Summary of Qualified Data
ENSR Data Validation Memo TH537

Sample ID	Compound	Result	Reporting Limit	Units	Lab Qual	Validation Qual	Reason Code
SG06B-05	Methylene chloride		0.77	ug/m3	J, B	U	b
SG13B-05	Acetone		47	ug/m3	B	U	b
SG13B-05	Methylene chloride		3.2	ug/m3	J, B	U	b
SG13B-05	Vinylacetate		32	ug/m3	J, B	U	b
SG14B-05	Methylene chloride		0.97	ug/m3	B	U	b
SG14B-05	N-Butylbenzene	0.71	0.33	ug/m3	M	J+	q
SG15B-05	Methylene chloride		1.6	ug/m3	J, B	U	b
SG15B-05	N-Butylbenzene	1.1	0.65	ug/m3	M	J+	q
SG29B-05	Acetone		830	ug/m3	J, B	U	b
SG29B-05	Methylene chloride		83	ug/m3	J, B	U	b
SG30B-05	2-Butanone		31	ug/m3	J, B	U	b
SG30B-05	Acetone		310	ug/m3	J, B	U	b
SG30B-05	Benzene		15	ug/m3	B	U	b
SG31B-05	Acetone		79	ug/m3	J, B	U	b
SG31B-05	Methylene chloride		7.9	ug/m3	J, B	U	b
SG55B-05	2-Butanone		34	ug/m3	J, B	U	b
SG55B-05	Acetone		340	ug/m3	J, B	U	b
SG55B-05	Benzene		9.9	ug/m3	B	U	b
SG55B-05	Methylene chloride		34	ug/m3	J, B	U	b
SG56B-05	2-Butanone		17	ug/m3	J, B	U	b
SG56B-05	Acetone		170	ug/m3	J, B	U	b
SG56B-05	Benzene		6.3	ug/m3	B	U	b
SG56B-05	Methylene chloride		17	ug/m3	J, B	U	b
SG56B-05D	Acetone		56	ug/m3	J, B	U	b
SG56B-05D	Methylene chloride		5.6	ug/m3	J, B	U	b
SG57B-05	Acetone		400	ug/m3	J, B	U	b
SG57B-05	Benzene		9.4	ug/m3	B	U	b
SG57B-05	Methylene chloride		40	ug/m3	J, B	U	b
SG58B-05	Acetone		570	ug/m3	J, B	U	b
SG58B-05	Methylene chloride		57	ug/m3	J, B	U	b
SG59B-05	Acetone		430	ug/m3	J, B	U	b
SG59B-05	Benzene		8.7	ug/m3	B	U	b
SG59B-05	Methylene chloride		43	ug/m3	J, B	U	b
SG60B-05	Acetone		1700	ug/m3	J, B	U	b
SG60B-05	Methylene chloride		170	ug/m3	J, B	U	b
SG77B-05	2-Butanone		78	ug/m3	J, B	U	b
SG77B-05	Acetone		780	ug/m3	J, B	U	b
SG77B-05	Ethanol		780	ug/m3	J, B	U	b
SG77B-05	Methylene chloride		78	ug/m3	J, B	U	b

Note:
Validation qualifiers are defined in Table E-1
Reason codes are defined in Table E-2

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Memorandum

Date: August 12, 2008

To: Mike Flack/Camarillo

From: Waverly Braunstein/Westford

Subject: Data Validation, TO-15 Analysis
Henderson Source Area Phase B Investigation
Tronox LLC Henderson, Nevada
CAS SDG P0801548

Distribution: R. Kennedy/Westford

04020-023-432
TH538to15wwb

SUMMARY

Limited validation was performed on the data for 19 soil gas samples analyzed for volatile organic compounds (VOCs) using EPA method TO-15. The samples were collected in Summa® canisters at Henderson, NV on May 21 and 22, 2008 and submitted to Columbia Analytical Services (CAS), Simi Valley, CA. The data were processed and reported under CAS project number P0801548.

The analytical data were evaluated with reference to EPA Method TO-15, the Region 9 Superfund Data Evaluation/Validation Guidance, NDEP Guidance on Data Validation (5/06), and the quality control (QC) criteria specified in the Quality Assurance Project Plan (QAPP). Validation actions were derived from the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (10/99). Modification of the Functional Guidelines was performed to accommodate the non-CLP methodology.

In general, the data are valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were qualified during validation due to nonconformances to the quality control (QC) acceptance criteria (see discussion below).

SAMPLES

Sample IDs	Sample IDs
SG42B-05	SG51B-05D (field duplicate of SG51B-05)
SG45B-05	SG53B-05
SG46B-05	SG53B-05D (field duplicate of SG53B-05)
SG47B-05	SG54B-05
SG48B-05	SG66B-05
SG49B-05	SG67B-05

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Sample IDs	Sample IDs
SG91B-05	SG68B-05
SG93B-05	SG69B-05
SG50B-05	SG87B-05
SG51B-05	

REVIEW ELEMENTS

Sample data were reviewed for the following elements:

- Agreement of analyses conducted with chain-of-custody (COC) requests
- Data package completeness
- Holding times
- Initial and continuing calibrations
- Method blanks/canister blanks
- Surrogate spike recoveries
- Internal standard results
- Laboratory control sample (LCS) results
- Field duplicate results
- Laboratory duplicate results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analyses Conducted with COC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC. No discrepancies were noted.

Data Package Completeness

The data package was complete as received.

Holding Times

The samples were analyzed within the method specified holding time.

Initial and Continuing Calibrations

The percent relative standard deviations (%RSDs), and the response factors (RFs) of all target compounds were within the QC acceptance criteria for the initial and continuing calibrations associated with the sample analyses.

Method Blanks/Canister Blanks

Selected target compounds were detected in several laboratory method blanks associated with the sample analyses. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action levels (ALs) were established at 10x the concentration detected in the laboratory method blank for the common laboratory contaminants

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acetone and 2-butanone, and at 5x the concentration detected in the method blank for the remaining compounds. The following table summarizes the level of blank contamination detected in the blanks; the ALs; and the associated samples. Blank results and ALs are adjusted by dilution factors before comparison to sample results and quantitation limits.

Blank ID	Analysis Date	Compound	Conc. ($\mu g/m^3$)	AL ($\mu g/m^3$)	Associated Samples
MS13053008MB	5/30/2008	Acetone	0.16	1.6	SG42B-05 SG46B-05 SG47B-05 SG48B-05 SG51B-05 SG51B-05D SG67B-05 SG68B-05 SG69B-05 SG91B-05 SG93B-05
MS13060208MB	6/2/2008	2-Butanone	0.12	1.2	SG51B-05 SG51B-05D SG53B-05 SG53B-05D SG54B-05 SG66B-05
		Acetone	0.66	6.6	
		Ethanol	0.093	0.465	
		Naphthalene	0.12	0.6	
		Vinylacetate	0.22	1.1	
MS13060308MB	6/3/2008	Acetone	0.16	1.6	SG45B-05 SG49B-05 SG50B-05 SG87B-05

Sample results were qualified as follows:

- If the sample result was < the sample quantitation limit (SQL) and < the AL, the result was reported as not detected (U) at the SQL.
- If the sample result was > SQL but < AL, the result was reported as not detected (U) at the reported concentration.
- If the sample result was > AL, the result was not qualified.

Target compounds were not detected in the canister blanks.

The samples were collected in canisters verified as clean by the laboratory through routine checks of ten percent of the canisters cleaned. Canister blank certificates are not provided for these samples.

Surrogate Spike Recoveries

Surrogate percent recoveries (%Rs) met the QC acceptance criteria for all samples in this data set.

Internal Standard Results

All internal standard recoveries met the QC acceptance criteria.

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LCS Results

The LCS %Rs met the QC acceptance limits of 70-130% for all sample analyses.

Field Duplicate Results

Samples SG51B-05/SG51B-05D and SG53B-05/SG53B-05D were submitted as the field duplicate pairs with this sample set. The following tables list the relative percent differences (RPDs) of the detected compounds.

SG51B-05			
Compound	**Original Result (ug/m3)**	**Duplicate Result (ug/m3)**	**RPD (%)**
Ethylbenzene	3.8	0.77 J	133
Styrene	0.19 J	3.1 U	NC
N-Propylbenzene	0.79	3.1 U	NC
N-Butylbenzene	0.59	1.2 U	NC
1,4-Dichlorobenzene	5	0.62 U	NC
Allyl chloride	0.31	0.62 U	NC
1,2-Dichloroethane	7.3	7.3	0
Acrylonitrile	0.11 J	3.1 U	NC
4-Methyl-2-pentanone	3.1	1.8 J	53
1,3,5-Trimethylbenzene	5.3	3.1 U	NC
Toluene	50	26	63
Chlorobenzene	32	8.1	119
n-Octane	17	4.4	118
1,2,4-Trichlorobenzene	0.37	0.62 U	NC
1,4-Dioxane	0.77 U	0.92 J	18
Dibromochloromethane	4.1	3.4	19
Tetrachloroethene	490	440	11
sec-Butylbenzene	0.23 J	3.1 U	NC
n-Heptane	19	15	24
cis-1,2-Dichloroethene	0.23	0.62 U	NC
trans-1,2-Dichloroethylene	0.13 J	0.62 U	NC
1,3-Dichlorobenzene	0.43	0.62 U	NC
Carbon tetrachloride	79	78	1.3
2-Hexanone	2 M	3.1 U	NC
4-Ethyltoluene	0.83	3.1 U	NC
Ethanol	11	14 J	24
Acetone	400 U	330	NC
Benzene	160	150	6.4
1,1,1-Trichloroethane	0.41	0.45 J	9.3
Bromomethane	0.24	0.61 J	87
Chloromethane	6.5	27	122
Chloroethane	75	76	1.3

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SG51B-05			
Compound	**Original Result (ug/m3)**	**Duplicate Result (ug/m3)**	**RPD (%)**
Vinyl chloride	1.9	2	5.1
Methylene chloride	90	90	0
Carbon disulfide	5.6	6.5	15
Bromoform	4.6	2.6 J	56
Bromodichloromethane	7.3	7.2	1.4
1,1-Dichloroethane	84	84	0
1,1-Dichloroethene	3.2	3	6.4
t-Butyl alcohol	3.7	5.5	39
Trichlorofluoromethane	2.1	2.1	0
Dichlorodifluoromethane	2	2.1 J	4.9
1,1,2-Trichlorotrifluoroethane	0.5	0.47 J	6.2
1,2-Dichlorotetrafluoroethane	0.081 J	3.1 U	NC
1,2-Dichloropropane	2.6	2.4	8.0
2-Butanone	25	33	28
1,1,2-Trichloroethane	0.13 J	0.62 U	NC
Trichloroethene	35	33	5.9
Hexachlorobutadiene	2.9	0.62 U	NC
Naphthalene	1.1	1.2 U	NC
o-Xylene	9.7	0.58 J	177
1,2-Dichlorobenzene	0.94	0.62 U	NC
1,2,4-Trimethylbenzene	4	3.1 U	NC
Isopropylbenzene	1.2	3.1 U	NC
alpha-Methyl styrene	0.16 J	3.1 U	NC
4-Isopropyltoluene	1.1	3.1 U	NC
m,p-Xylene	27	2.4 J	167
Chloroform	3100	3100	0

The RPDs for styrene, n-propylbenzene, n-butylbenzene, 1,4-dichlorobenzene, allyl chloride, acrylonitrile, 1,3,5-trimethylbenzene, 1,2,4-trichlorobenzene, sec-butylbenzene, cis-1,2-dichloroethene, trans-1,2-dichloroethylene, 1,3-dichlorobenzene, 2-hexanone, 4-ethyltoluene, 1,2-dichlorotetrafluoroethane, 1,1,2-trichloroethane, hexachlorobutadiene, naphthalene, 1,2-dichlorobenzene, 1,2,4-trimethylbenzene, isopropylbenzene, alpha-methyl styrene, acetone, and 4-isopropyltoluene were not calculable (NC) due to a non-detect result in either the original or the duplicate. Positive and non-detected results for 1,4-dichlorobenzene, 1,3,5-trimethylbenzene, hexachlorobutadiene, 1,2-dichlorobenzene, and 1,2,4-trimethylbenzene were qualified as estimated (J and UJ, respectively) in samples SG51B-05 and SG51B-05D since the detected result was greater than five times the reporting limit. Precision was deemed acceptable for the remaining compounds since the detected result was less than five times the reporting limit in each case.

Results for ethyl benzene, toluene, chlorobenzene, n-octane, chloromethane, o-xylene, and m,p-xylenes in samples SG51B-05 and SG51B-05D were qualified as estimated (J) since the RPDs exceeded the acceptance criteria of 50% when both results are greater than five times the reporting

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limit or 100% when results are less than five times the reporting limit. All other RPDs met the acceptance criteria.

SG53B-05			
Compound	Original Result (ug/m3)	Duplicate Result (ug/m3)	RPD (%)
Ethylbenzene	2.4	3.3	32
Styrene	1.7 U	0.28 J	NC
N-Propylbenzene	0.56 J	0.84 J	40
N-Butylbenzene	1.7	1	52
1,4-Dichlorobenzene	11	4.5	84
1,2-Dichloroethane	13	13	0
Vinyl acetate	4.9 J	4.3 J	13
4-Methyl-2-pentanone	0.85 J	1.4	49
1,3,5-Trimethylbenzene	0.93 J	1.5	47
Toluene	8.4	8.4	0
Chlorobenzene	1.5	1.5	0
n-Octane	0.71 J	0.63 J	12
1,2,4-Trichlorobenzene	1.9	2	5.1
1,4-Dioxane	1.7 U	0.39 J	NC
Tetrachloroethene	65	66	1.5
n-Heptane	0.52 J	0.44 J	17
1,3-Dichlorobenzene	0.25 J	0.24 J	4.1
Carbon tetrachloride	0.46	0.44	4.4
2-Hexanone	0.77 J	0.61 J	23
4-Ethyltoluene	0.88 J	1.5	52
Ethanol	2.4 J	2.5 J	4.1
Benzene	5	3.4	38
Chloroethane	100	100	0
Vinyl chloride	0.52	0.5	3.9
Methylene chloride	12	12	0
Carbon disulfide	1.1 J	18	177
Bromodichloromethane	0.24 J	0.27 J	12
1,1-Dichloroethane	130	130	0
1,1-Dichloroethene	3.5	3.6	2.8
t-Butyl alcohol	0.77 J	1.4	58
Trichlorofluoromethane	1	1.1	9.5
Dichlorodifluoromethane	2	1.9	5.1
1,1,2-Trichlorotrifluoroethane	0.48	0.49	2.1
1,2-Dichloropropane	0.33 U	0.17 J	NC
2-Butanone	4.2	4.9	15
1,1,2-Trichloroethane	5.4	5.6	3.6
Trichloroethene	1.1	0.69	46
Hexachlorobutadiene	4.8	5.6	15

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Naphthalene	6.9	7.2	4.3
o-Xylene	3.5	5.2	39
1,2-Dichlorobenzene	0.33	0.3	9.5
1,2,4-Trimethylbenzene	2.2	4.5	69
Isopropylbenzene	1.7 U	0.21 J	NC
4-Isopropyltoluene	0.47 J	1.2 J	87
m,p-Xylene	11	16	37
Chloroform	1400	1300	7.4

The RPDs for styrene, 1,4-dioxane, 1,2-dichloropropane, and isopropylbenzene were NC due to a non-detect result in either the original or the duplicate. Precision was deemed acceptable for each of these compounds since the detected result was less than five times the reporting limit in each case.

Results for 1,4-dichlorobenzene and carbon disulfide in samples SG53B-05 and SG53B-05D were qualified as estimated (J) since the RPDs exceeded the acceptance criteria of 50% when both results are greater than five times the reporting limit or 100% when results are less than five times the reporting limit. All other RPDs met the acceptance criteria.

Laboratory Duplicate Results

Laboratory duplicate analyses were performed on sample SG68B-05. Precision was deemed acceptable for all compounds.

Quantitation Limits and Sample Results

All samples were analyzed at minor dilutions due to the requirement to pressurize the canisters prior to analysis. Sample results and sample quantitation limits were adjusted accordingly.

In addition, several samples required additional dilution due to target compound concentrations that exceeded the calibration range. All dilution factors associated with reported results are tabulated below.

Sample ID	Dilution Factors
SG42B-05	3.88
SG45B-05	1.49
SG46B-05	1.58, 15.8
SG47B-05	1.66, 33.2
SG48B-05	1.58
SG49B-05	1.63
SG87B-05	2.17
SG91B-05	3.2, 64
SG93B-05	3.28, 32.8
SG50B-05	1.78
SG51B-05	1.53, 61.2
SG51B-05D	6.2, 62
SG53B-05	3.3, 55
SG53B-05D	2.78, 55.6
SG54B-05	71.2, 890
SG66B-05	3.06, 61.2

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Sample ID	Dilution Factors
SG67B-05	1.67, 16.7
SG68B-05	1.54
SG69B-05	326, 3260

The laboratory combined the results from multiple runs to ensure that all results were within the calibration range, and non-detect results were reported at the lowest possible reporting limit. The laboratory did not adjust the reporting limits for the additional analytical dilutions.

The laboratory appended an "M" qualifier to selected results to indicate possible matrix interference due to elution of non-target compounds, leading to a potential high bias in the results. Associated results less than the reporting limit were already flagged with a "J" to indicate an estimated result; in these cases, the "M" qualifier was removed and the "J" qualifier was retained. If the associated result was greater than the reporting limit, the "M" qualifier was replaced with "J+" during validation to indicate an estimated value with possible high bias.

Attachments

Summary of qualified data

Summary of Qualified Data
ENSR Data Validation Memo TH538

Sample ID	Compound	Result	Reporting Limit	Units	Lab Qual	Validation Qual	Reason Code
SG51B-05	1,2,4-Trimethylbenzene	4.0	0.77	ug/m3		J	fd
SG51B-05	1,2-Dichlorobenzene	0.94	0.15	ug/m3		J	fd
SG51B-05	1,3,5-Trimethylbenzene	5.3	0.77	ug/m3		J	fd
SG51B-05	1,4-Dichlorobenzene	5.0	0.15	ug/m3		J	fd
SG51B-05	Acetone		400	ug/m3	B	U	b
SG51B-05	Chlorobenzene	32	0.15	ug/m3		J	fd
SG51B-05	Chloromethane	6.5	0.15	ug/m3		J	fd
SG51B-05	Ethylbenzene	3.8	0.77	ug/m3		J	fd
SG51B-05	Hexachlorobutadiene	2.9	0.15	ug/m3		J	fd
SG51B-05	m,p-Xylene	27	0.77	ug/m3		J	fd
SG51B-05	n-Octane	17	0.77	ug/m3		J	fd
SG51B-05	o-Xylene	9.7	0.77	ug/m3		J	fd
SG51B-05	Toluene	50	0.77	ug/m3		J	fd
SG51B-05D	1,2,4-Trimethylbenzene		3.1	ug/m3	U	UJ	fd
SG51B-05D	1,2-Dichlorobenzene		0.62	ug/m3	U	UJ	fd
SG51B-05D	1,3,5-Trimethylbenzene		3.1	ug/m3	U	UJ	fd
SG51B-05D	1,4-Dichlorobenzene		0.62	ug/m3	U	UJ	fd
SG51B-05D	Chlorobenzene	8.1	0.62	ug/m3		J	fd
SG51B-05D	Chloromethane	27	0.62	ug/m3		J	fd
SG51B-05D	Ethylbenzene	0.77	3.1	ug/m3	J	J	fd
SG51B-05D	Hexachlorobutadiene		0.62	ug/m3	U	UJ	fd
SG51B-05D	m,p-Xylene	2.4	3.1	ug/m3	J	J	fd
SG51B-05D	n-Octane	4.4	3.1	ug/m3		J	fd
SG51B-05D	o-Xylene	0.58	3.1	ug/m3	J	J	fd
SG51B-05D	Toluene	26	3.1	ug/m3		J	fd
SG53B-05	1,4-Dichlorobenzene	11	0.33	ug/m3		J	fd
SG53B-05	Acetone		17	ug/m3	J, B, M	U	b
SG53B-05	Carbon disulfide	1.1	1.7	ug/m3	J	J	fd
SG53B-05D	1,4-Dichlorobenzene	4.5	0.28	ug/m3		J	fd
SG53B-05D	Acetone		14	ug/m3	J, B, M	U	b
SG53B-05D	Carbon disulfide	18	1.4	ug/m3		J	fd
SG54B-05	Acetone		360	ug/m3	J, B	U	b
SG54B-05	Ethanol		360	ug/m3	J, B	U	b
SG69B-05	Acetone		1600	ug/m3	J, B	U	b
SG42B-05	Acetone	38	19	ug/m3	B, M	J+	q
SG47B-05	Acetone	29	8.3	ug/m3	B, M	J+	q
SG49B-05	Acetone	16	8.2	ug/m3	B, M	J+	q
SG93B-05	Acetone	16	16	ug/m3	J, B, M	J+	q
SG51B-05	2-Hexanone	2.0	0.77	ug/m3	M	J+	q

Note:
Validation qualifiers are defined in Table E-1
Reason codes are defined in Table E-2

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Memorandum

Date: August 12, 2008

To: Mike Flack/Camarillo

From: Waverly Braunstein/Westford

Subject: Data Validation, TO-15 Analysis
Henderson Source Area Phase B Investigation
Tronox LLC Henderson, Nevada
CAS SDG P0801656

Distribution: R. Kennedy/Westford

04020-023-432
TH539to15wwb

SUMMARY

Limited validation was performed on the data for 23 soil gas samples analyzed for volatile organic compounds (VOCs) using EPA method TO-15. The samples were collected in Summa® canisters at Henderson, NV on May 28 and 29, 2008 and submitted to Columbia Analytical Services (CAS), Simi Valley, CA. The data were processed and reported under CAS project number P0801656.

The analytical data were evaluated with reference to EPA Method TO-15, the Region 9 Superfund Data Evaluation/Validation Guidance, NDEP Guidance on Data Validation (5/06), and the quality control (QC) criteria specified in the Quality Assurance Project Plan (QAPP). Validation actions were derived from the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (10/99). Modification of the Functional Guidelines was performed to accommodate the non-CLP methodology.

In general, the data are valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were qualified during validation due to nonconformances to the quality control (QC) acceptance criteria (see discussion below).

SAMPLES

Sample IDs	Sample IDs
SG01B-05	SG42BR-05
SG02B-05	SG52B-05
SG03B-05	SG53BR-05
SG04B-05	SG53BR-05D (field duplicate of SG53BR-05)
SG05B-05	SG60BR-05
SG19B-05	SG65BR-05
SG20B-05	SG65BR-05D (field duplicate of SG65BR-05)

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Sample IDs	Sample IDs
SG21B-05	SG74B-05
SG23B-05	SG90B-05
SG24B-05	SG92B-05
SG25B-05	SG94BR-05
SG34B-05	

REVIEW ELEMENTS

Sample data were reviewed for the following elements:

- Agreement of analyses conducted with chain-of-custody (COC) requests
- Data package completeness
- Holding times
- Initial and continuing calibrations
- Method blanks/canister blanks
- Surrogate spike recoveries
- Internal standard results
- Laboratory control sample (LCS) results
- Field duplicate results
- Laboratory duplicate results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analyses Conducted with COC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC. No discrepancies were noted.

Data Package Completeness

The data package was complete as received.

Holding Times

The samples were analyzed within the method specified holding time.

Initial and Continuing Calibrations

The percent relative standard deviations (%RSDs), and the response factors (RFs) of all target compounds were within the QC acceptance criteria for the initial and continuing calibrations associated with the sample analyses.

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Method Blanks/Canister Blanks

Acetone and methylene were detected in several laboratory method blanks associated with the sample analyses. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action levels (ALs) were established at 10x the concentration detected in the laboratory method blank for the common laboratory contaminants acetone and methylene chloride. The following table summarizes the level of blank contamination detected in the blanks; the action levels; and the associated samples. Blank results and ALs are adjusted by dilution factors before comparison to sample results and quantitation limits.

Blank ID	Analysis Date	Compound	Conc. ($\mu g/m^3$)	AL ($\mu g/m^3$)	Associated Samples
MS13060408MB	6/4/2008	Acetone	0.13	1.3	SG20B-05, SG23B-05, SG24B-05, SG34B-05, SG74B-05, SG90B-05
MS13060508MB	6/5/2008	Acetone	0.19	1.9	SG01B-05, SG03B-05, SG42BR-05, SG52B-05, SG60BR-05, SG94BR-05
MS13060608MB	6/6/2008	Acetone	0.41	4.1	SG02B-05, SG04B-05, SG05B-05, SG53BR-05, SG53BR-05D, SG65BR-05, SG65BR-05D, SG92B-05
MS13060708MB	6/7/2008	Acetone	0.42	4.2	SG19B-05, SG20B-05, SG21B-05, SG23B-05, SG24B-05, SG25B-05, SG34B-05, SG53BR-05, SG53BR-05D, SG90B-05
		Methylene chloride	0.18	1.8	

Sample results were qualified as follows:

- If the sample result was < the sample quantitation limit (SQL) and < the AL, the result was reported as not detected (U) at the SQL.
- If the sample result was > SQL but < AL, the result was reported as not detected (U) at the reported concentration.
- If the sample result was > AL, the result was not qualified.

Target compounds were not detected in the canister blanks.

The samples were collected in canisters verified as clean by the laboratory through routine checks of ten percent of the canisters cleaned. Canister blank certificates are not provided for these samples.

Surrogate Spike Recoveries

Surrogate percent recoveries (%Rs) met the QC acceptance criteria for all samples in this data set.

Internal Standard Results

All internal standard recoveries met the QC acceptance criteria.

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LCS Results

The LCS %Rs met the QC acceptance limits of 70-130% for all sample analyses.

Field Duplicate Results

Samples SG53BR-05/SG53BR-05D and SG65B-05/SG65B-05D were submitted as the field duplicate pairs with this sample set. The following tables list the relative percent differences (RPDs) of the detected compounds.

SG53BR-05			
Compound	Original Result (ug/m3)	Duplicate Result (ug/m3)	RPD (%)
1,1,2-Trichloroethane	5.2	5.2	0
1,1,2-Trichlorotrifluoroethane	0.47	0.47	0
1,1-Dichloroethane	120	120	0
1,1-Dichloroethene	3.4	3.4	0
1,2,4-Trichlorobenzene	3.1	3.2	3.2
1,2,4-Trimethylbenzene	1.6	0.79	68
1,2-Dichlorobenzene	0.28	0.27	3.6
1,2-Dichloroethane	13	13	0
1,2-Dichloropropane	0.21	0.18	15
1,2-Dichlorotetrafluoroethane	0.078 J	0.081 J	3.8
1,3,5-Trimethylbenzene	0.40 J	0.13 J	102
1,3-Dichlorobenzene	0.23	0.24	4.3
1,4-Dichlorobenzene	9.1	10	9.4
1,4-Dioxane	1.3	1.2	8.0
2-Butanone	5.8	7.6	27
2-Hexanone	0.41 J	0.49 J	18
4-Ethyltoluene	0.49 J	0.33 J	39
4-Isopropyltoluene	0.29 J	0.21 J	32
4-Methyl-2-pentanone	0.26 J	0.28 J	7.4
Acetone	15 J+	15	0
Benzene	2.6	2.5	3.9
Bromodichloromethane	0.21	0.20	4.9
Bromomethane	0.081 J	0.11 J	30
Carbon disulfide	3.4	33	163
Carbon tetrachloride	0.45	0.45	0
Chlorobenzene	1.1	1.1	0
Chloroethane	96	96	0
Chloroform	1500	1200	22
Chloromethane	0.12 J	0.15 U	NC
Dichlorodifluoromethane	2.0	1.9	5.1
Ethanol	5.3 J	5.2 J	1.9
Ethylbenzene	0.78	0.54 J	36
Hexachlorobutadiene	6.4	6.7	4.6
Isopropylbenzene	0.11 J	0.77 U	NC

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SG53BR-05			
Compound	Original Result (ug/m3)	Duplicate Result (ug/m3)	RPD (%)
m,p-Xylene	3.1	2.3	30
Methyl tert butyl ether	U	0.10 J	NC
Methylene chloride	11	12	8.7
N-Butylbenzene	0.55	0.41	29
n-Heptane	0.49 J	0.23 J	72
n-Octane	0.60 J	0.30 J	67
N-Propylbenzene	0.38 J	0.29 J	27
Naphthalene	2.5	2.4	4.1
o-Xylene	1.2	0.90	29
sec-Butylbenzene	0.098 J	0.77 U	NC
Styrene	0.20 J	0.77 U	NC
t-Butyl alcohol	0.27 J	0.28 J	3.6
Tetrachloroethene	59	59	0
Toluene	3.0	3.1	3.3
Trichloroethene	0.38	0.36	5.4
Trichlorofluoromethane	1.0	1.0	0
Vinyl acetate	5.1 J	7.5 J	38
Vinyl chloride	0.35	0.35	0

The RPDs for chloromethane, isopropylbenzene, methyl tert butyl ether, sec-butylbenzene, and styrene were not calculable (NC) due to a non-detect result in either the original or the duplicate. Precision was deemed acceptable for each of these compounds since the detected result was less than five times the reporting limit in each case.

Results for 1,3,5-trimethylbenzene and carbon disulfide in samples SG53BR-05 and SG53BR-05D were qualified as estimated (J) since the RPDs exceeded the acceptance criteria of 50% when both results are greater than five times the reporting limit or 100% when results are less than five times the reporting limit. All other RPDs met the acceptance criteria.

SG65BR-05			
Compound	Original Result (ug/m3)	Duplicate Result (ug/m3)	RPD (%)
1,1,2-Trichlorotrifluoroethane	0.51	0.46	10%
1,2,4-Trichlorobenzene	0.29	0.34	16%
1,2,4-Trimethylbenzene	0.13 J	0.21 J	47%
1,2-Dichlorotetrafluoroethane	0.82 U	0.084 J	NC
1,4-Dichlorobenzene	17	19	11%
1,4-Dioxane	0.17 J	0.21 J	21%
2-Butanone	4.8	4.8	0
2-Hexanone	0.35 J	0.37 J	5.6%
4-Ethyltoluene	0.82 U	0.097 J	NC
4-Isopropyltoluene	0.83	0.13 J	146%

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SG65BR-05			
Compound	Original Result (ug/m3)	Duplicate Result (ug/m3)	RPD (%)
4-Methyl-2-pentanone	0.53 J	0.52 J	1.9%
Acetone	22 J+	29	27%
Benzene	1.2	1.1	8.7%
Bromodichloromethane	0.58	0.59	1.7%
Bromoform	0.17 J	0.17 J	0
Bromomethane	0.16 U	0.14 J	NC
Carbon disulfide	5.5	0.73 J	153%
Carbon tetrachloride	0.50	0.53	5.8%
Chloroethane	0.25	0.16 J	44%
Chloroform	7.8	7.7	1.3%
Dibromochloromethane	0.27	0.30	11%
Dichlorodifluoromethane	1.9	2.0	5.1%
Ethanol	8.9	8.9	0
Hexachlorobutadiene	0.28	0.30	6.9%
m,p-Xylene	0.25 J	0.30 J	18%
Methyl tert butyl ether	0.16 J	0.16 U	NC
Methylene chloride	0.23 J	0.18 J	24%
N-Butylbenzene	0.18 J	0.19 J	5.4%
Naphthalene	0.56	0.63	12%
o-Xylene	0.16 J	0.19 J	17%
t-Butyl alcohol	0.20 J	0.20 J	0
Tetrachloroethene	1.6	1.8	12%
Toluene	0.92	1.6	54%
Trichloroethene	0.33	0.32	3.1%
Trichlorofluoromethane	1.2	1.1	8.7%
Vinylacetate	2.0 J	3.8 J	62%

The RPDs for 1,2-dichlorotetrafluoroethane, 4-ethyltoluene, bromomethane, and methyl tert butyl ether were NC due to a non-detect result in either the original or the duplicate. Precision was deemed acceptable for each of these compounds since the detected result was less than five times the reporting limit in each case.

Results for 4-isopropyltoluene and carbon disulfide in samples SG65B-05 and SG65B-05D were qualified as estimated (J) since the RPDs exceeded the acceptance criteria of 50% when both results are greater than five times the reporting limit or 100% when results are less than five times the reporting limit. All other RPDs met the acceptance criteria.

Laboratory Duplicate Results

Laboratory duplicate analyses were performed on sample SG68B-05. Precision was deemed acceptable for all compounds.

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Quantitation Limits and Sample Results

All samples were analyzed at minor dilutions due to the requirement to pressurize the canisters prior to analysis. Sample results and sample quantitation limits were adjusted accordingly.

In addition, several samples required additional dilution due to target compound concentrations that exceeded the calibration range. All dilution factors associated with reported results are tabulated below.

Sample ID	Dilution Factors
SG01B-05	1.7
SG02B-05	1.7
SG03B-05	1.61
SG04B-05	1.53
SG05B-05	1.63
SG19B-05	1.69
SG20B-05	3.04, 50.67
SG21B-05	1.67
SG23B-05	3.14, 52.33
SG24B-05	3.3, 55
SG25B-05	1.7
SG34B-05	2.96, 49.3
SG42BR-05	1.5
SG52B-05	3.08, 308
SG53BR-05	1.53, 51
SG53BR-05D	1.53, 51
SG60BR-05	312, 3120
SG65BR-05	1.64
SG65BR-05D	1.64
SG74B-05	3.38
SG90B-05	3.26, 65.2
SG92B-05	1.64, 32.8
SG94BR-05	1.67

The laboratory combined the results from multiple runs to ensure that all results were within the calibration range, and non-detect results were reported at the lowest possible reporting limit. The laboratory did not adjust the reporting limits for the additional analytical dilutions.

The laboratory appended an "M" qualifier to selected results to indicate possible matrix interference due to elution of non-target compounds, leading to a potential high bias in the results. Associated results less than the reporting limit were already flagged with a "J" to indicate an estimated result; in these cases, the "M" qualifier was removed and the "J" qualifier was retained. If the associated result was greater than the reporting limit, the "M" qualifier was replaced with "J+" during validation to indicate an estimated value with possible high bias.

Attachments

Summary of qualified data

Summary of Qualified Data
ENSR Data Validation Memo TH539

Sample ID	Compound	Result	Reporting Limit	Units	Lab Qual	Validation Qual	Reason Code
SG01B-05	Acetone	33	8.5	ug/m3	B, M	J+	q
SG04B-05	Acetone	12	7.7	ug/m3	B, M	J+	q
SG19B-05	Methylene chloride		1.7	ug/m3	B	U	b
SG21B-05	Methylene chloride		0.84	ug/m3	J, B	U	b
SG21B-05	Acetone	16	8.4	ug/m3	B, M	J+	q
SG24B-05	Acetone	18	17	ug/m3	B, M	J+	q
SG25B-05	Methylene chloride		0.85	ug/m3	J, B	U	b
SG25B-05	Acetone	23	8.5	ug/m3	B, M	J+	q
SG42BR-05	Acetone	15	7.5	ug/m3	B, M	J+	q
SG53BR-05	1,3,5-Trimethylbenzene	0.40	0.77	ug/m3	J	J	fd
SG53BR-05	Carbon disulfide	3.4	0.77	ug/m3		J	fd
SG53BR-05	Acetone	15	7.7	ug/m3	B, M	J+	q
SG53BR-05D	1,3,5-Trimethylbenzene	0.13	0.77	ug/m3	J	J	fd
SG53BR-05D	Carbon disulfide	33	0.77	ug/m3		J	fd
SG60BR-05	Acetone		1600	ug/m3	J, B	U	b
SG65BR-05	4-Isopropyltoluene	0.83	0.82	ug/m3		J	fd
SG65BR-05	Carbon disulfide	5.5	0.82	ug/m3		J	fd
SG65BR-05	Acetone	22	8.2	ug/m3	B, M	J+	q
SG65BR-05D	4-Isopropyltoluene	0.13	0.82	ug/m3	J	J	fd
SG65BR-05D	Carbon disulfide	0.73	0.82	ug/m3	J	J	fd
SG92B-05	Acetone	10	8.2	ug/m3	B, M	J+	q
SG94BR-05	Acetone	41	8.4	ug/m3	B, M	J+	q

Note:
Validation qualifiers are defined in Table E-1
Reason codes are defined in Table E-2