

**ATTACHMENT C-4**  
**DATA VALIDATION REPORTS ON COMPACT DISC**

**DATA VALIDATION REPORTS**

**LEVEL III DATA VALIDATION**

**LEVEL IV DATA VALIDATION**

**DATA VALIDATION REPORT  
CASMALIA HAZARDOUS WASTE MANAGEMENT FACILITY  
LEVEL III DATA VALIDATION**

Data validation was performed on data packages received by GeoSyntec Consultants (GeoSyntec) from Air Toxics LTD Laboratory of Folsom, California. Soil vapor sampling was conducted at the Casmalia Hazardous Waste Management Facility Site and the samples were analyzed by EPA Method TO-15 and ASTM Method D-1495 (isobutane analysis only) in August and September 2004, and November 2005. In order to satisfy the requirements of the Casmalia Quality Assurance Project Plan (QAPP), 100 percent of the data received were validated at a level III validation, while a minimum of ten percent of the soil vapor data were validated at a level IV data validation. The following section contains 9 Level III validation reports from the period described above.

The data were reviewed in accordance with the principles presented in USEPA National Functional Guidelines for Laboratory Data Review Organics (EPA, 2001), EPA Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified methods. The data review processes described below for the Level III data validation provide information on the analytical limitations of the data based on specified quality control (QC) criteria. The data are discussed by report number and analytical test.

It is important to note that the Level IV data validation requirements as defined and specified in the Casmalia Site specific Quality Assurance Project Plan is equivalent to the Level or tier III validation as defined by EPA, the Level III data validation requirements as defined and specified in the Casmalia Site specific Quality Assurance Project Plan is equivalent to the Level or tier II validation as defined by EPA.

WO0408356A/B

Work Order 0408356A and B

<b>Client ID</b>	<b>Laboratory ID</b>
RISV-01	0408356A/B* - 01A
RISV-02	0408356A/B – 02A
RISV-03	0408356A/B – 03A

\* A identifier denotes TO-15 and B identifier denotes ASTM D-1945

Matrix: Soil Vapor

**General Comments:**

No Trip Blank was listed on the chain-of-custody (COC) although apparently one was received with the other three summa canisters. The Narrative referred to “Four 6 Liter Summa Canister samples” which would indicate the presence of a trip blank.

The sample chain-of-custody (COC) had a write-over on it for the telephone number instead of the use of acceptable error correction format of a single line striking through the text with the initials of the person making the correction.

All holding times were met.

**EPA TO-15 (Volatile Organic by GC/MS)**

All data were within QC criteria.

**ASTM D-1945 (Isobutane)**

All data were within QC criteria.

**Work Order 0409553A and B**

<b>Client ID</b>	<b>Laboratory ID</b>
RI Tedlar 2	0409553A/B* - 01A

\* A identifier denotes TO-15 and B identifier denotes ASTM D-1945

Matrix: Soil Vapor

**General Comments:**

The sample chain-of-custody (COC) had incorrect documentation changes instead of the use of acceptable error correction format of a single line striking through the text with the initials of the person making the correction. The “Custody Seal Intact” question box was not filled out.

All holding times were met.

**EPA TO-15 (Volatile Organic by GC/MS)**

All data were within QC criteria.

**ASTM D-1945 (Isobutane)**

All data were within QC criteria.

**Work Order 0409488A and B**

<b>Client ID</b>	<b>Laboratory ID</b>
RISV-14	0409488A/B* - 01A
RISV-15	0409488A/B* - 02A
RISV-16	0409488A/B* - 03A
RISV-16A	0409488A/B* - 04A

\* A identifier denotes TO-15 and B identifier denotes ASTM D-1945

Matrix: Soil Vapor

**General Comments:**

All holding times were met with the exception of sample RISV-14 for Method TO-15 re-analysis. The sample was reanalyzed one day out of holding time in order to report Freon 113 at a dilution within the calibration range.

**EPA TO-15 (Volatile Organic by GC/MS)**

All data were within QC criteria.

**ASTM D-1945 (Isobutane)**

All data were within QC criteria.

**Work Order 0409486AR1 and B**

<b>Client ID</b>	<b>Laboratory ID</b>
RISV-22	0409486A/B* - 01A
RISV-23	0409486A/B - 02A
RISV-24	0409486A/B - 03A
RISV-25	0409486A/B - 04A
RISV-Trip	0409486A/B - 05A

\* A identifier denotes TO-15 and B identifier denotes ASTM D-1945; R1 indicates re-issuance of a corrected report.

Matrix: Soil Vapor

**General Comments:**

The sample chain-of-custody (COC) had incorrect documentation changes instead of the use of acceptable error correction format of a single line striking through the text with the initials of the person making the correction. The “Custody Seal Intact” question box was not filled out on one of the COCs. Additionally the COC consisted of two pages although there was no notation or pagination that indicated more than one page.

All holding times were met.

**EPA TO-15 (Volatile Organic by GC/MS)**

All data were within QC criteria.

**ASTM D-1945 (Isobutane)**

All data were within QC criteria.

**Work Order 0409487A and B**

Client ID	Laboratory ID
RISV-21	0409487A/B* - 03A
RISV-26	0409487A/B - 04A
RISV-17	0409487A/B - 05A
RISV-18	0409487A/B - 06A
RISV-19	0409487A/B - 07A
RISV-20	0409487A/B – 08A

\* A identifier denotes TO-15 and B identifier denotes ASTM D-1945

Matrix: Soil Vapor

**General Comments:**

The sample chain-of-custody (COC) had incorrect documentation changes instead of the use of acceptable error correction format of a single line striking through the text with the initials of the person making the correction. The “Custody Seal Intact” question box was not filled out on one of the COCs. Additionally the COC consisted of two pages although there was no notation or pagination that indicated more than one page.

All holding times were met.

**EPA TO-15 (Volatile Organic by GC/MS)**

All data were within QC criteria.

**ASTM D-1945 (Isobutane)**

All data were within QC criteria.

**Work Order 0409428AR1 and B**

Client ID	Laboratory ID
RISV-10	0409428AR1/B* - 01A
RISV-11	0409428AR1/B - 02A
RISV-12	0409428AR1/B - 03A
RISV-13	0409428A/B - 04A

\* A identifier denotes TO-15 and B identifier denotes ASTM D-1945; R1 indicates a reanalysis.

Matrix: Soil Vapor

**General Comments:**

The sample chain-of-custody (COC) had an obliteration in the address line instead of the use of acceptable error correction format of a single line striking through the text with the initials of the person making the correction.

All holding times were met.

**EPA TO-15 (Volatile Organic by GC/MS)**

The laboratory control sample associated with the reanalysis of samples RISV-10 through 12 had low recovery for MTBE. Therefore, according to validation guidelines, MTBE for RISV-10, RISV-11 and RISV-12 is “UJ” qualified as estimated with a low bias. Additionally because of the duplicate analysis of the samples due to reanalysis, the % relative difference for the compounds was calculated. The following compounds are “J” qualified as estimated due to %RPD values outside of the normal 25% criteria: Sample RISV-10; 1,1-dichloroethene and m,p-xylene, Sample RISV-11; 1,1-dichloroethene and chloroform, and sample RISV-12; 2-butanone and trichloroethene. All other data were within QC criteria.

**ASTM D-1945 (Isobutane)**

All data were within QC criteria.

**Overall Summary**

The data as qualified are acceptable for use. Reporting limits varied throughout the TO-15 analyses due to high concentrations of various analytes in the samples which necessitated that the samples be analyzed at dilutions. The analyses were within the requirements of the referenced methods.

WO409428AR1/B

If you have any questions regarding this submittal, please contact me at (865) 330-0037

Sincerely,

A handwritten signature in black ink, reading "Julia J. Caserio". The signature is written in a cursive style with a large, looping initial "J" and a distinct "C" for "Caserio".

**REFERENCES**

*USEPA National Functional Guidelines for Organic Data Review*, October 1999. Office of Emergency and Remedial Response, Washington, DC.

**Work Order 0409422AR1**

This data package reported the results for six soil vapor samples. The samples were collected September 20, 2004. The table below lists the samples reported in this data package and their corresponding laboratory ID numbers.

<b>Client ID</b>	<b>Laboratory ID</b>
RISV-04	0409422AR1 – 01A
RISV-05	0409422AR1 – 02A
RISV-06	0409422AR1 – 03A
RISV-07	0409422AR1 – 04A
RISV-08	0409422AR1 - 05A
RISV-09	0409422AR1 - 06A

Matrix: Soil Vapor

**EPA TO-15 (Volatile Organic by GC/MS)**

The data reported in this package are considered usable for meeting project objectives without qualification. All results are considered to be valid and the analytical completeness for this data set is 100%. Because all of the samples in this data set were collected and analyzed under similar prescribed conditions, the data within this set are considered comparable.

Holding Times - All holding times were met with the exception of samples RISV-05 and RISV-09 which were reanalyzed one day past the holding time. The narrative indicated that RISV-08 was re-analyzed outside of the holding time instead of RISV-05. This is incorrect according to the dates on the sample results forms. Because this was not considered a gross exceedence of holding time, the data were not qualified.

Method Blank- A method blank was analyzed at the proper frequency for the number and type of samples analyzed. No target analytes were detected in the method blank. No qualification based on the method blank results was warranted.

Laboratory Control Sample (LCS) – An LCS was prepared and analyzed for the applicable sample matrices at the proper frequency. The recoveries of all spiked analytes were within the laboratory's acceptance ranges. The LCS results indicate that the level of accuracy demonstrated by the analytical method with respect to a clean sample matrix is acceptable.

Surrogate Compound Recoveries – An appropriate number of surrogate compounds were spiked into each sample for the TO-15 analyses. All surrogate recoveries were within the laboratory's acceptance ranges. The surrogate results indicate that an acceptable level of accuracy was attained with respect to the individual sample matrix.

Data – All essential data were included in the data package. Initial calibration data, continuing calibration data, GCMS tune data, as well as relative response factors, retention time data, run logs, standard data and canister certification data were accountable. Calculation checks were performed on the raw data from the calibration sequence as well as sample and surrogate results.

**Work Order 0409422B**

This data package reported the results for six soil vapor samples. The samples were collected September 20, 2004. The table below lists the samples reported in this data package and their corresponding laboratory ID numbers.

<b>Client ID</b>	<b>Laboratory ID</b>
RISV-04	0409422B – 01A
RISV-05	0409422B – 02A
RISV-06	0409422B – 03A
RISV-07	0409422B – 04A
RISV-08	0409422B - 05A
RISV-09	0409422B - 06A

Matrix: Soil Vapor

**ASTM D-1945 (Isobutane Analysis by GC/FID)**

The data reported in this package are considered usable for meeting project objectives without qualification. All results are considered to be valid and the analytical completeness for this data set is 100%. Because all of the samples in this data set were collected and analyzed under similar prescribed conditions, the data within this set are considered comparable.

Holding Times - All holding times were met.

Method Blank- A method blank was analyzed at the proper frequency for the number and type of samples analyzed. No target analytes were detected in the method blank. No qualification based on the method blank results was warranted.

Laboratory Control Sample (LCS) – An LCS was prepared and analyzed for the applicable sample matrices at the proper frequency. The recovery of the spiked analyte was within the laboratory’s acceptance ranges. The LCS results indicate that the level

of accuracy demonstrated by the analytical method with respect to a clean sample matrix is acceptable.

Data – All essential data were included in the data package. Initial calibration data, continuing calibration data, as well as response factors, retention time data, run logs, and standard data were accountable. Calculation checks were performed on the raw data from the calibration sequence as well as sample results.

**Overall Summary**

The data as qualified are acceptable for use. The analyses were within the requirements of the referenced methods.

If you have any questions regarding this submittal, please contact me at (865) 330-0037

Sincerely,

A handwritten signature in black ink, appearing to read "Julia K. Caprio". The signature is written in a cursive style with a large, looping initial "J".

Julia K. Caprio

**REFERENCES**

*USEPA National Functional Guidelines for Organic Data Review*, October 1999. Office of Emergency and Remedial Response, Washington, DC.

**Work Order 0511273A**

This data package reported the results for four soil vapor samples. The samples were collected November 11, 2005. The table below lists the samples reported in this data package and their corresponding laboratory ID numbers.

<b>Client ID</b>	<b>Laboratory ID</b>
RISV-27	0511273A-01A
RISV-28	0511273A-02A
RISV-29	0511273A-03A
Trip Blank	0511273A- 04A

Matrix: Soil Vapor

**EPA TO-15 (Volatile Organic by GC/MS)**

The data reported in this package are considered usable for meeting project objectives as qualified. All results are considered to be valid and the analytical completeness for this data set is 100%. Because all of the samples in this data set were collected and analyzed under similar prescribed conditions, the data within this set are considered comparable.

Holding Times - All holding times were met.

Trip Blank – A trip blank was analyzed and no target analytes were detected above the reporting limit.

Method Blank- A method blank was analyzed at the proper frequency for the number and type of samples analyzed. No target analytes were detected in the method blank. No qualification based on the method blank results was warranted.

Laboratory Control Sample (LCS) – An LCS was prepared and analyzed for the applicable sample matrices at the proper frequency. The recoveries of all spiked analytes were within the laboratory’s acceptance ranges with the exception of vinyl

acetate which was outside of the QC criteria with a low recovery of 48% and 1,2,4-trichlorobenzene with was outside of the QC criteria with a low recovery of 68%. These two compounds should be “UJ” qualified as estimated less than the reporting limit, in all of the samples associated with the LCS including the trip blank. The overall LCS results indicate that the level of accuracy demonstrated by the analytical method with respect to a clean sample matrix is acceptable.

Surrogate Compound Recoveries – An appropriate number of surrogate compounds were spiked into each sample for the TO-15 analyses. All surrogate recoveries were within the

laboratory's acceptance ranges. The surrogate results indicate that an acceptable level of accuracy was attained with respect to the individual sample matrix.

Laboratory Duplicate Sample (Dup) – A laboratory duplicate sample (0511273A- 01AA) was prepared and analyzed for the applicable sample matrices at the proper frequency. The relative percent difference (RPD) for all of the detected analytes were within the laboratory's acceptance ranges with the exception of 2-hexanone and benzene which had RPDs greater than 200%. These two compounds were “J” qualified as estimated in sample 0511273A-01A. The overall duplicate results indicate that the level of precision demonstrated by the analytical method with respect to the sample matrix is acceptable.

Data – All essential data were included in the data package. Initial calibration data, continuing calibration data, GCMS tune data, as well as relative response factors, retention time data, run logs, standard data and canister certification data were accountable. Calculation checks were performed on the raw data from the calibration sequence as well as sample and surrogate results.

General Note: The samples were improperly relinquished on the chain of custody (COC). No date or time was recorded with the sample relinquished signature.

**Work Order 0511273B**

This data package reported the results for four soil vapor samples. The samples were collected November 11, 2005. The table below lists the samples reported in this data package and their corresponding laboratory ID numbers.

<b>Client ID</b>	<b>Laboratory ID</b>
RISV-27	0511273A-01A
RISV-28	0511273A-02A
RISV-29	0511273A-03A
Trip Blank	0511273A- 04A

Matrix: Soil Vapor

**ASTM D-1945 (Isobutane Analysis by GC/FID)**

The data reported in this package are considered usable for meeting project objectives without qualification. All results are considered to be valid and the analytical completeness for this data set is 100%. Because all of the samples in this data set were collected and analyzed under similar prescribed conditions, the data within this set are considered comparable.

Holding Times - All holding times were met.

Trip Blank – A trip blank was analyzed and no target analytes were detected above the reporting limit.

Method Blank- A method blank was analyzed at the proper frequency for the number and type of samples analyzed. No target analytes were detected in the method blank. No qualification based on the method blank results was warranted.

Laboratory Control Sample (LCS) – An LCS was prepared and analyzed for the applicable sample matrices at the proper frequency. The recovery of the spiked analyte was within the laboratory's acceptance ranges. The LCS results indicate that the level of accuracy demonstrated by the analytical method with respect to a clean sample matrix is acceptable.

Data – All essential data were included in the data package. Initial calibration data, continuing calibration data, as well as response factors, retention time data, run logs, and standard data were accountable. Calculation checks were performed on the raw data from the calibration sequence as well as sample results.

General Note: The samples were improperly relinquished on the chain of custody (COC). No date or time was recorded with the sample relinquished signature.

**Work Order 0511330A and 0511330C**

This data package reported the results for sixteen soil vapor samples. The samples were collected November 14-15, 2005. The table below lists the samples reported in this data package and their corresponding laboratory ID numbers.

<b>Client ID</b>	<b>Laboratory ID</b>
RISV-30	0511330A-01A
RISV-31	0511330A-02A
RISV-32	0511330A-03A
RISV-33	0511330A-04A
RISV-34	0511330A-05A
RISV-35	0511330A-06A
RISV-36	0511330A-07A
RISV-37	0511330A-08A
RISV-38	0511330A-09A
RISV-39	0511330A-10A
RISV-40	0511330A-11A
RISV-42	0511330A-13A
RISV-43	0511330A-14A
RISV -41 High (Dilution)	0511330C-12A
RISV-41 Low	0511330C-12B
RISV-44	0511330C-15A
Trip Blank	0511330C-16A

Matrix: Soil Vapor

**EPA TO-15 (Volatile Organic by GC/MS)**

The data reported in this package are considered usable for meeting project objectives as qualified. All results are considered to be valid and the analytical completeness for this data set is 100%. Because all of the samples in this data set were collected and analyzed under similar prescribed conditions, the data within this set are considered comparable.

Holding Times - All holding times were met.

Trip Blank - A trip blank was analyzed and no target analytes were detected above the reporting limit.

Method Blank- A method blank was analyzed at the proper frequency for the number and type of samples analyzed. No target analytes were detected in the method blank. No qualification based on the method blank results was warranted.

Laboratory Control Sample (LCS) - An LCS was prepared and analyzed for the applicable sample matrices at the proper frequency. The recoveries of all spiked analytes were within the laboratory's acceptance ranges with the exception of vinyl acetate which was outside of the QC criteria with a low recovery of 51 %, carbon tetrachloride outside of QC criteria with a recovery of 62%, hexachlorobutadiene outside of QC criteria with a recovery of 64% and 1,2,4-trichlorobenzene with was outside of the QC criteria with a low recovery of 68% (0511330C-19A, 0511330A 17 A). These four compounds should be "UJ" qualified as estimated less than the reporting limit, in all of the samples associated with this LCS. For LCS 0511330C 19B, carbon tetrachloride was outside of QC criteria with a low recovery of 63% and styrene had a high recovery of 131 %. All of the associated samples should be "UJ" qualified as estimated less than the reporting limit for carbon tetrachloride. Styrene was not detected in any of the associated samples. The overall LCS results indicate that the level of accuracy demonstrated by the analytical method with respect to a clean sample matrix is acceptable.

Surrogate Compound Recoveries - An appropriate number of surrogate compounds were spiked into each sample for the TO-15 analyses. All surrogate recoveries were within the laboratory's acceptance ranges. The surrogate results indicate that an acceptable level of accuracy was attained with respect to the individual sample matrix.

Laboratory Duplicate Sample (Dup) - A laboratory duplicate sample (0511330A 06AA) was prepared and analyzed for the applicable sample matrices at the proper frequency. The relative percent difference (RPD) for all of the detected analytes were within the laboratory's acceptance ranges. The duplicate results indicate that the level of precision demonstrated by the analytical method with respect to the sample matrix is acceptable.

Data - All essential data were included in the data package. Initial calibration data, continuing calibration data, GCMS tune data, as well as relative response factors, retention time data, run logs, standard data and canister certification data were accountable. Calculation checks were performed on the raw data from the calibration sequence as well as sample and surrogate results.

Data Note: Two compounds were outside of the QC criteria with a high bias in the continuing calibration verification (CCY) 0511330A-16A; trans-1,3-dichloropropene and styrene. However, because all of the results for these compounds were non-detect, the data were not qualified.

Three compounds were outside of the QC criteria with a high bias in the continuing calibration verification (CCY) 0511330C-18B; vinyl acetate, trans-1,3-dichloropropene and styrene. However, because all of the results for these compounds were non-detect, the data were not qualified.

General Note: According to the collection date for samples RISK-40, -41, -42, -43, RISK-44, and Trip Blank on the COC, the samples were collected 10/15/05. However, the date on the sample tag reflects a collection date of 11/15/05. This discrepancy should be corrected on the original COC.

### **Work Order 0511330B**

This data package reported the results for sixteen soil vapor samples. The samples were collected November 14-15, 2005. The table below lists the samples reported in this data package and their corresponding laboratory ID numbers.

<b>Client ID</b>	<b>Laboratory ID</b>
RISV-30	0511330B-01A
RISV-31	0511330B-02A
RISV-32	0511330B-03A
RISV-33	0511330B-04A
RISV-34	0511330B-05A
RISV-35	0511330B-06A
RISV-36	0511330B-07A
RISV-37	0511330B-08A
RISV-38	0511330B-09A
RISV-39	0511330B-10A
RISV-40	0511330B-11A
RISV-41	0511330B-13A
RISV-42	0511330B-14A
RISV-43	0511330B-12B
RISV-44	0511330B-15A
Trip Blank	0511330B-16A

Matrix – Soil Vapor

### **ASTM D-1945 (Isobutane Analysis by GC/FID)**

The data reported in this package are considered usable for meeting project objectives without qualification. All results are considered to be valid and the analytical completeness for this data set is 100%. Because all of the samples in this data set were collected and analyzed under similar prescribed conditions, the data within this set are considered comparable.

Holding Times - All holding times were met.

Trip Blank - A trip blank was analyzed and no target analytes were detected above the reporting limit.

Method Blank- A method blank was analyzed at the proper frequency for the number and type of samples analyzed. No target analytes were detected in the method blank. No qualification based on the method blank results was warranted.

Laboratory Duplicate Sample (Dup) - Two laboratory duplicate samples (0511330B 06AA and -12AA) were prepared and analyzed for the applicable sample matrices at the proper frequency. Isobutane was not detected above reportable levels in any of the samples analyzed. The duplicate results indicate that the level of precision demonstrated by the analytical method with respect to the sample matrix is acceptable.

Laboratory Control Sample (LCS) - An LCS was prepared and analyzed for the applicable sample matrices at the proper frequency. The recovery of the spiked analyte was within the laboratory's acceptance ranges. The LCS results indicate that the level of accuracy demonstrated by the analytical method with respect to a clean sample matrix is acceptable.

Data - All essential data were included in the data package. Initial calibration data, continuing calibration data, as well as response factors, retention time data, run logs, and standard data were accountable. Calculation checks were performed on the raw data from the calibration sequence as well as sample results.

General Note: According to the collection date for samples RISY-40, -41, -42, -43, RISY-44, and Trip Blank on the COC, the samples were collected 10/15/05. However, the date on the sample tag reflects a collection date of 11/15/05. This discrepancy should be corrected on the original COC.

**Overall Summary**

The data as qualified are acceptable for use. The analyses were within the requirements of the referenced methods.

If you have any questions regarding this submittal, please contact me at (865) 330-0037

Sincerely,

A handwritten signature in black ink that reads "Julia K. Caprio". The signature is written in a cursive style with a large, looping initial "J" and a distinct "K" and "C".

Julia K. Caprio

**DATA VALIDATION REPORT  
CASMALIA HAZARDOUS WASTE MANAGEMENT FACILITY  
LEVEL III DATA VALIDATION**

Data validation was performed on data packages received by GeoSyntec Consultants (GeoSyntec) from Air Toxics LTD Laboratory of Folsom, California. Soil vapor sampling was conducted at the Casmalia Hazardous Waste Management Facility Site and the samples were analyzed by EPA Method TO-15 and ASTM Method D-1495 (isobutane analysis only) in August and September 2004, and November 2005. In order to satisfy the requirements of the Casmalia Quality Assurance Project Plan (QAPP), 100 percent of the data received were validated at a level III validation, while a minimum of ten percent of the soil vapor data were validated at a level IV data validation. The following section contains 9 Level III validation reports from the period described above.

The data were reviewed in accordance with the principles presented in USEPA National Functional Guidelines for Laboratory Data Review Organics (EPA, 2001), EPA Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified methods. The data review processes described below for the Level III data validation provide information on the analytical limitations of the data based on specified quality control (QC) criteria. The data are discussed by report number and analytical test.

It is important to note that the Level IV data validation requirements as defined and specified in the Casmalia Site specific Quality Assurance Project Plan is equivalent to the Level or tier III validation as defined by EPA, the Level III data validation requirements as defined and specified in the Casmalia Site specific Quality Assurance Project Plan is equivalent to the Level or tier II validation as defined by EPA.

# Geosyntec Consultants

1531 Dick Lonas Road, Building A

Knoxville, TN 37909

PH 865.330.0037

FAX 865.330.9949

## Memorandum

Date: February 7, 2007

To: Robbie Ettinger

Copies to: Ruth Custance

From: GeoSyntec QA/QC Group

Subject: Summary of Level IV Validation for Air Toxics Limited Work Order: 511330D  
Casmalia Hazardous Waste Management Facility Site

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### Introduction

This report summarizes the findings of the full validation of one soil gas sample. This sample was collected November 15, 2005 as part of the Casmalia Hazardous Waste Management Facility site investigation. The soil gas samples were analyzed by Air Toxics Limited, Inc. in Folsom, California. The sample was analyzed for Volatile Organic Compounds (EPA TO-IS). The data were reviewed in accordance with the principles presented in the *USEPA A National Functional Guidelines for Laboratory Data Review, Organics* (EP A, 1999) EP A Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified methods.

### Executive Summary

The sample was analyzed as requested. The holding time was met. Some TO-IS compounds were qualified as estimated due to low recovery in the associated LCS and also due to reporting of compounds outside of the calibration criteria. The qualified compounds included: vinyl acetate and Freon 113. Overall, the data are useable for their intended purpose.

### 1.0 Volatile Organic Compounds (EPA TO-IS)

Full validation including recalculation was performed the laboratory data (sample RISV-44) for the analysis of volatile organic compounds (Method TO-IS). The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Data Completeness
- ✓ Holding Times and Preservation
- ✓ Calibrations (full validation)
- ✓ Internal Standards (full validation)
- ✓ Performance Check Sample (full validation)
- ✓ Blanks
- ✓ System Monitoring Compounds (Surrogates)
- ✓ Laboratory Control Samples
- ✓ Compound Identification and Quantitation

### 1.1 Data Completeness

All analyses were performed as requested on the chain of custody (COC) records.

### 1.2 Holding Times and Preservation

The sample was analyzed within the 30-day technical holding time from date of collection for volatiles.

### 1.3 Calibrations

#### 1.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSD was within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ). A three point calibration was used for tert-butyl alcohol.

### 1.3.2 Initial Calibration Verification (ICV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent differences (%D) between the RRFs in the initial calibration standards of all target analytes were within acceptance criteria ( $\pm 30$ ).

### 1.3.3 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ).

## 1.4 Internal Standards

All internal standard retention times are within  $\pm 30$  seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria ( $>50\%$  and  $<200\%$ ) of the associated continuing calibrations internal standard area counts.

## 1.5 Performance Check Samples

An instrument performance check sample was analyzed at the beginning of each 12-hour period during sample analysis. The samples were analyzed within the 12-hour period. All ion abundance criteria were met for bromofluorobenzene (BFB).

## 1.6 Blanks

There were no detections in any of the laboratory blanks.

## 1.7 System Monitoring ComlJounds (Surrogates)

The surrogates employed, dibromofluoromethane, 1,4-bromofluorobenzene, and toluene-d8, are appropriate to the method. All surrogate recoveries met laboratory acceptance limits.

## 1.8 Laboratory Control Samples (LCS)

All LCS recoveries were within statistically derived limits established by the laboratory with the following exception;

LCS	Compound	Recovery	Qualified Samples	Qualifier
0511330D-18A	Vinyl acetate	50%	RISV-44	UJ

1.9 Compound Identification and Quantitation

The sample was reported at a dilution and the resulting concentrations were within the calibration range with one exception

Qualified Sample	Compound	Result (ug/m3)	Qualifier
RISV-44	Freon 113	62000 E	J

## Memorandum

Date: January 28, 2008  
To: Kevin Coffman and Robert Ettinger  
Copies to: Julia Klens Caprio  
From: GeoSyntec QA/QC Group  
Subject: Summary of Level IV Validation for Air Toxics Work Order # 0710356 for  
the Casmalia Hazardous Waste Management Facility Site

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### Introduction

This report summarizes the findings of the full validation of three air canister performance evaluation samples (PESs). These PESs had a collection date of October 10, 2007 and were analyzed in support of the Casmalia Hazardous Waste Management Facility site investigation. The PESs were analyzed by Air Toxics LTD, Folsom, California. The samples were analyzed for Volatile Organic Compounds by Modified TO-15 with an emphasis on 1,3-butadiene and interferences. The data were reviewed in accordance with the principles presented in the USEPA National Functional Guidelines for Laboratory Data Review, Organics (EPA, 2005), EPA Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified method.

### Executive Summary

All samples were analyzed as requested. All holding times were met. Overall, the data are useable for their intended purpose based on the information provided.

### 1.0 Volatile Organic Compounds (PIANO – TO15 MOD)

Full validation including recalculation was performed the laboratory data (samples SRG0002, SRG0004, and SRG0006) for the analysis of volatile organic compounds (TO-15 Modified). The full TO-15 volatile organic compound list was reported. The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Data Completeness
- ✓ Holding Times and Preservation
- ✓ Calibrations (full validation)
- ✓ Internal Standards (full validation)
- ✓ Performance Check Sample (full validation)
- ✓ Blanks
- ✓ System Monitoring Compounds (Surrogates)
- ✓ Laboratory Control Samples
- ✓ Laboratory Duplicate
- ✓ Compound Identification and Quantitation

#### 1.1 Data Completeness

All analyses were performed as requested on the chain of custody (COC) records. Isobutylene was not added to the laboratory control spike resulting in the qualification of isobutylene results.

#### 1.2 Holding Times and Preservation

The samples were analyzed within the 30-day technical holding time from date of collection for volatiles with no exceptions.

#### 1.3 Calibrations

##### 1.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSDs were within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ).

##### 1.3.2 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ).

#### 1.4 Internal Standards

All internal standard retention times are within  $\pm 30$  seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria ( $\pm 40\%$ ) of the associated continuing calibrations internal standard area counts.

#### 1.5 Performance Check Samples

An instrument performance check sample was analyzed at the beginning of each 24-hour period during sample analysis. The samples were analyzed within the 24-hour period. All ion abundance criteria were met for bromofluorobenzene (BFB).

#### 1.6 Blanks

There were no detections of volatile organic compounds in the laboratory blank

### 1.7 System Monitoring Compounds (Surrogates)

The surrogates employed, 1,2-Dichloroethane-d4, 4-Bromofluorobenzene, and Toluene-d8, are appropriate to the method. All surrogate recoveries met laboratory acceptance limits.

### 1.8 Laboratory Control Samples (LCS)

All LCS recoveries were within the control limits with the exception of 1,2,4-Trichlorobenzene which had a recovery of 64%. Therefore, results for 1,2,4-TCB are UJ qualified as estimated less than the reporting limit.

Additionally, because Isobutylene was not included in the LCS, the sample concentrations of Isobutylene are J qualified as estimated or UJ qualified as estimated less than the reporting limit.

Sample	Compound	Laboratory Result (ppbv)	Validation Result (ppbv)
SRG0002	Isobutylene	0.50 U	0.50 UJ
	1,2,4-TCB	0.50 U	0.50 UJ
SRG0004	Isobutylene	0.50 U	0.50 UJ
	1,2,4-TCB	0.50 U	0.50 UJ
SRG0006	Isobutylene	17	17 J
	1,2,4-TCB	0.50 U	0.50 UJ

B- Found in associated blank as well as sample

### 1.9 Laboratory Duplicate Samples

No sample duplicate was reported with the data set.

### 2.0 Compound Identification and Quantitation

All compound identifications and quantifications were found to be appropriate.

## Memorandum

Date: February 7, 2007  
To: Robbie Ettinger  
Copies to: Ruth Custance  
From: GeoSyntec QA/QC Group  
Subject: Summary of Level IV Validation for Air Toxics Limited Work Order:  
0608012A  
Casmalia Hazardous Waste Management Facility Site

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### Introduction

This report summarizes the findings of the full validation of four soil gas samples. These samples were collected July 31, 2006 as part of the Casmalia Hazardous Waste Management Facility site investigation. The soil gas samples were analyzed by Air Toxics Limited, Inc. in Folsom, California. The samples were collectively analyzed for Volatile Organic Compounds (EPA TO-15), and Isobutane (ASTM D-1945). The data were reviewed in accordance with the principles presented in the *USEPA National Functional Guidelines for Laboratory Data Review, Organics* (EPA, 1999) EPA Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified methods.

### Executive Summary

All samples were analyzed as requested. All holding times were met. Some TO-15 compounds were qualified as estimated due to relative standard deviation (RSD) exceedences in the initial calibration criteria and LCS procedural criteria. The qualified compounds included: MTBE, vinyl acetate, 2-butanone, trans-1,3-dichloropropene and 3-chloropropene. Overall, the data are useable for their intended purpose.

### 1.0 Volatile Organic Compounds (EPA TO-15)

Full validation including recalculation was performed the laboratory data (samples RISV-40, RISV-41, RISV-42, and QCTB-1) for the analysis of volatile organic compounds (Method TO-15). The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Data Completeness
- ✓ Holding Times and Preservation
- ⊗ Calibrations (full validation)
- ✓ Internal Standards (full validation)
- ✓ Performance Check Sample (full validation)
- ⊗ Blanks
- ✓ System Monitoring Compounds (Surrogates)
- ⊗ Laboratory Control Samples
- ✓ Compound Identification and Quantitation

1.1 Data Completeness

All analyses were performed as requested on the chain of custody (COC) records. The samples were analyzed for iso-butane by ASTM 1945 which was not listed on the COC.

1.2 Holding Times and Preservation

The samples were analyzed within the 30-day technical holding time from date of collection for volatiles with no exceptions.

1.3 Calibrations

1.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSD was within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ) with the following exceptions:

Compound	Actual (% RSD)
Vinyl Acetate	60

The following qualifications are applied to the data:

Sample	Compound	Result ( $\mu\text{g}/\text{m}^3$ )	Qualifier
RISV-40	Vinyl Acetate	140 U	UJ
RISV-41	Vinyl Acetate	5.7 U	UJ
RISV-42	Vinyl Acetate	5.9 U	UJ
QCTB-1	Vinyl Acetate	1.8 U	UJ

1.3.2 Initial Calibration Verification (ICV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent differences (%D) between the RRFs in the initial calibration standards of all target analytes were within acceptance criteria ( $\pm 30$ ).

1.3.3 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ).

#### 1.4 Internal Standards

All internal standard retention times are within  $\pm 30$  seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria ( $>50\%$  and  $<200\%$ ) of the associated continuing calibrations internal standard area counts.

#### 1.5 Performance Check Samples

An instrument performance check sample was analyzed at the beginning of each 12-hour period during sample analysis. The samples were analyzed within the 12-hour period. All ion abundance criteria were met for bromofluorobenzene (BFB).

#### 1.6 Blanks

There were not detections in any of the laboratory blanks. There were detections of toluene, m,p-xylene and o-xylene in the QC trip blank, sample QCTB-1.

Sample	Compound	Concentration ( $\mu\text{g}/\text{m}^3$ )
QCTB-1	toluene	1.3
QCTB-1	m,p-Xylene	2.1
QCTB-1	o-xylene	0.8

No qualifications were applied to the data since the detected concentrations of toluene, m,p-xylene, and o-xylene in the associated samples were greater than 10X the amount in the trip blank.

#### 1.7 System Monitoring Compounds (Surrogates)

The surrogates employed, dibromofluoromethane, 1,4-bromofluorobenzene, and toluene-d<sub>8</sub>, are appropriate to the method. All surrogate recoveries met laboratory acceptance limits.

#### 1.8 Laboratory Control Samples (LCS)

All LCS recoveries were within statistically derived limits established by the laboratory with the following exception; 3-chloropropene was not added to the LCS.

LCS	Compound	Recovery	Qualified Samples	Qualifier
0608012A-07A and 0608012-07B	3-chloropropene	not added to LCS sample	All Samples	UJ

#### 1.9 Compound Identification and Quantitation

Dilutions were performed on the samples and the resulting concentrations were within the calibration range. No qualifications were applied to the data.

## 2.0 Isobutane (Method ASTM D-1945)

Full validation including recalculation was performed the laboratory data (samples RISV-40, RISV-41, RISV-42, and QCTB-1) for the analysis of Isobutane (Method ASTM D-1945). The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Data Completeness
- ✓ Holding Times and Preservation
- ✓ Calibrations (full calibration)✓
- ✓ Blanks
- ✓ Laboratory Control Samples
- ✓ Compound Identification and Quantitation

### 2.1 Data Completeness

All analyses were performed as requested on the chain-of-custody records.

### 2.2 Holding Times and Preservation

The samples were extracted by the laboratory within the 7-day holding time from date of collection and analyzed within the 40-day holding time from extraction to analysis for semivolatiles.

### 2.3 Calibrations

#### 2.3.1 Initial Calibrations (IC)

An appropriate initial calibration was performed for each analyte. The laboratory calculated the percent relative standard deviation (%RSD) for each target analyte. For all target analytes, the average relative response factors (RRFs) were greater than 0.05 and the %RSD were within acceptance criteria (+30%).

#### 2.3.2 Initial Calibration Verification (ICV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 with the exception of Benzidine. The percent differences (%D) between the RRFs in the initial calibration standards of all target analytes were within acceptance criteria ( $\pm 30\%$ ).

#### 2.3.3. Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05. The percent differences (%D) between the RRFs in the initial calibration of the midrange calibration standard of all target analytes were within acceptance criteria ( $\pm 30\%$ ).

2.4 Blanks

No target compounds were detected in the associated method or equipment blanks.

2.5 Laboratory Control Samples (LCS)

All LCS recoveries were within laboratory acceptance criteria.

2.6 Compound Identification and Quantitation

No dilutions were performed.

## Memorandum

Date: February 4, 2008  
To: Robert Ettinger  
Copies to: Ruth Custance  
From: GeoSyntec QA/QC Group  
Subject: Summary of Level IV Validation for Air Toxics Work Order # 0710370A and 0710370B for the Casmalia Hazardous Waste Management Facility Site

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### Introduction

This report summarizes the findings of the full validation of two soil gas samples and a blank soil gas sample. These samples were collected October 12, 2007 as part of the Casmalia Hazardous Waste Management Facility site investigation. The samples were analyzed by Air Toxics LTD, Folsom, California. The samples were analyzed for Volatile Organic Compounds by Modified TO-15 with a full scan and by Method ASTM D-1945 GC/FID. The data were reviewed in accordance with the principles presented in the *USEPA National Functional Guidelines for Laboratory Data Review, Organics* (EPA, 2005), EPA Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified method.

### Executive Summary

All samples were analyzed as requested. All holding times were met. Overall, the data are useable for their intended purpose based on the information provided.

### 1.0 Volatile Organic Compounds (TO15 MOD)

Full validation including recalculation was performed the laboratory data (samples RISV-51, RISV-52, and QCTB-1) for the analysis of volatile organic compounds (TO-15 Modified). The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Data Completeness
- ✓ Holding Times and Preservation
- ✓ Calibrations (full validation)
- ✓ Internal Standards (full validation)
- ✓ Performance Check Sample (full validation)
- ⊗ Blanks
- ✓ System Monitoring Compounds (Surrogates)
- ⊗ Laboratory Control Samples
- ✓ Laboratory Duplicate
- ✓ Compound Identification and Quantitation

#### 1.1 Data Completeness

All analyses were performed as requested on the chain of custody (COC) records. Report 0710370A was reissued as 0710370AR1 to correct sample identification numbers that were misread by the lab from the original COC.

#### 1.2 Holding Times and Preservation

The samples were analyzed within the 30-day technical holding time from date of collection for volatiles with no exceptions.

#### 1.3 Calibrations

##### 1.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSDs were within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ).

##### 1.3.2 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ).

#### 1.4 Internal Standards

All internal standard retention times are within  $\pm 30$  seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria ( $\pm 40\%$ ) of the associated continuing calibrations internal standard area counts.

#### 1.5 Performance Check Samples

An instrument performance check sample was analyzed at the beginning of each 24-hour period during sample analysis. The samples were analyzed within the 24-hour period. All ion abundance criteria were met for bromofluorobenzene (BFB).

### 1.6 Blanks

There were no detections of volatile organic compounds in the laboratory blank. Toluene was detected in the trip blank QCTB-1 at 0.44 ppbv. Based on this detection the following detections of toluene in the associated data were changed to elevated reporting limits:

Sample	Compound	Laboratory Result (ppbv)	Validation Result (ppbv)
RISV-S2	Toluene	0.31	0.31 U
RISV-S2 DUP	Toluene	0.30	0.30 U

U= not detected below this concentration

### 1.7 System Monitoring Compounds (Surrogates)

The surrogates employed, 1,2-Dichloroethane-d4, 4-Bromofluorobenzene, and Toluene-d8, are appropriate to the method. All surrogate recoveries met laboratory acceptance limits.

### 1.8 Laboratory Control Samples (LCS)

All LCS recoveries were within the control limits with the exception of acetone which had a recovery of 144%. Therefore, the detected results for acetone are J qualified as estimated.

Additionally, it was noted that Isobutylene was not included in the LCS spike. Because Isobutylene was not included in the LCS, the undetected sample concentrations of Isobutylene are UJ qualified as estimated less than the reporting limit; the detected concentration of Isobutylene is J qualified as estimated.

Sample	Compound	Laboratory Result (ppbv)	Validation Result (ppbv)
RISV-51	Acetone	4.2	4.2 J
	Isobutylene	0.70 U	0.70 UJ
RISV-52	Acetone	5.8	5.8 J
	Isobutylene	5.2	5.2 J
RISV-52 Lab Duplicate	Acetone	5.6	5.6 J
QCTB-1	Isobutylene	0.50 U	0.50 UJ

### 1.10 Laboratory Duplicate Samples

Sample RISV-52 was analyzed as the laboratory sample duplicate. The RPD between the results was compared to a criterion of  $\leq 30\%$ . Acceptable precision was demonstrated for the laboratory duplicate pair, with the following exceptions. The concentration of Carbon tetrachloride in sample RISV-52 is below the reporting limit

and the concentration of Carbon tetrachloride in sample RISV-52 Lab Dup is at the reporting limit, based on professional judgment, no sample qualifications were made. However, Chloromethane in samples RISV-52 and RISV-52 Lab Dup are J qualified as estimated due to the RPD result of 32%. It was noted that a laboratory duplicate was not reported for the Isobutylene and Butane analyses.

Sample	Compound	Laboratory Result (ppbv)	RPD (%)	Validation Result (ppbv)
RISV-52	Chloromethane	0.72	32	0.72 J
RISV-52 Lab Dup		0.52		0.52 J
RISV-52	Freon 11	0.19	10	NA
RISV-52 Lab Dup		0.21		NA
RISV-52	Ethanol	1.0	2	NA
RISV-52 Lab Dup		0.98		NA
RISV-52	Acetone	5.8	4	NA
RISV-52 Lab Dup		5.6		NA
RISV-52	Carbon Tetrachloride	0.16 U	200	NA
RISV-52 Lab Dup		0.16		NA
RISV-52	Benzene	0.17	6	NA
RISV-52 Lab Dup		0.18		NA
RISV-52	Toluene	0.31	3	NA
RISV-52 Lab Dup		0.30		NA
RISV-52	m,p-Xylene	0.23	4	NA
RISV-52 Lab Dup		0.24		NA

#### 1.11 Compound Identification and Quantitation

All compound identifications and quantifications were found to be appropriate.

### 3.0 Isobutane (Method ASTM D-1945)

Full validation including recalculation was performed the laboratory data (samples RISV-51, RISV-52, and QCTB-1) for the analysis of Isobutane (ASTM D-1945 Modified). The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Data Completeness
- ✓ Holding Times and Preservation
- ✓ Calibrations (full validation)
- ✓ Blanks
- ✓ Laboratory Control Samples
- ✓ Laboratory Duplicate
- ✓ Compound Identification and Quantitation

#### 2.1 Data Completeness

All analyses were performed as requested on the COC records. The project narrative indicated that butane was analyzed and reported by ASTM Method D-1945. Butane was not reported in this work order (WO#0710370B).

#### 2.2 Holding Times and Preservation

The samples were analyzed within the holding time.

#### 2.3 Calibrations

##### 2.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSDs were within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ).

##### 2.3.2 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ).

#### 2.4 Blanks

Isobutane was not detected in the associated method blank or sample QCTB-1.

2.5 Laboratory Control Sample (LCS)

The LCS recovery was within the laboratory acceptance criteria.

2.6 Laboratory Duplicate Sample

Sample RISV-S1 was analyzed as the laboratory sample duplicate for the Isobutane analysis. The RPD between the results was compared to a criterion of <30%.

Isobutane was not detected in either sample. Acceptable precision was demonstrated for the laboratory duplicate pair.

2.7 Compound Identification and Quantification

All compound identifications and quantifications were found to be appropriate.

## Memorandum

Date: January 28, 2008  
To: Kevin Coffman and Robert Ettinger  
Copies to: Julia Klens Caprio  
From: GeoSyntec QA/QC Group  
Subject: Summary of Level IV Validation for Alpha Woods Hole ETR 0710103 for the  
Casmalia Hazardous Waste Management Facility Site

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### Introduction

This report summarizes the findings of the full validation of two soil gas samples and a blank soil gas sample. These samples were collected October 12, 2007 as part of the Casmalia Hazardous Waste Management Facility site investigation. The soil gas samples were analyzed by Alpha Woods Hole Laboratory, Mansfield, Massachusetts. The samples were analyzed for Volatile Organic Compounds by Alpha Woods Hole Lab SOP *Determination of PIANO Volatile Organic Compounds in Ambient Air and Soil Vapor Using Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (Revision 1.0) Method TO-15, modified*. The data were reviewed in accordance with the principles presented in the *USEPA National Functional Guidelines for Laboratory Data Review, Organics* (EPA, 2005), EPA Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified method.

### Executive Summary

All samples were analyzed as requested. All holding times were met. Overall, the data as qualified are useable for their intended purpose.

### 1.0 Volatile Organic Compounds (PIANO – TO15 MOD)

Full validation including recalculation was performed the laboratory data (samples RISV-51, RISV-52, and QCTB-1) for the analysis of volatile organic compounds (PIANO-TO15 SOP). The volatile organic compound list consisted of MTBE, Hexane, Cyclohexane, Benzene, Heptane, Toluene, Ethylbenzene, p/m-Xylene, Butane, 1,3-Butadiene, Styrene, o-Xylene, Isobutylene, and 1,3,5-Trimethylbenzene. The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

4 February 2008

- ⊗ Data Completeness
- ✓ Holding Times and Preservation
- ⊗ Calibrations (full validation)
- ✓ Internal Standards (full validation)
- ✓ Performance Check Sample (full validation)
- ⊗ Blanks
- ✓ System Monitoring Compounds (Surrogates)
- ⊗ Laboratory Control Samples
- ✓ Sample Duplicate
- ⊗ Compound Identification and Quantitation

#### 1.1 Data Completeness

All analyses were performed as requested on the chain of custody (COC) records with the exception of the request of Isobutane analysis. Isobutane results were not reported with this data set. It was noted during the data validation process that manual integrations were performed on the initial calibration and continuing calibration standards; however, appropriate documentation (before and after chromatograms) were not included in the original data package. Manual integrations were requested from and received from the lab and found to be appropriate. Isobutylene was not added to the laboratory control spike or laboratory control spike duplicate, nor was it added to the initial calibration verification resulting in the qualification of isobutylene results.

#### 1.2 Holding Times and Preservation

The samples were analyzed within the 30-day technical holding time from date of collection for volatiles with no exceptions.

#### 1.3 Calibrations

##### 1.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSDs were within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ).

##### 1.3.2 Initial Calibration Verification (ICV)

An ICV was analyzed; all target analytes had relative response factors (RRFs) greater than 0.05 and the percent differences (%D) between the RRFs in the initial calibration standards and the ICV were within acceptance criteria ( $\pm 30\%$  difference). It was noted that Isobutylene was not included in the ICV standard; however, no sample qualifications were made.

4 February 2008

### 1.3.3 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ).

### 1.4 Internal Standards

All internal standard retention times are within  $\pm 30$  seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria ( $\pm 40\%$ ) of the associated continuing calibrations internal standard area counts.

### 1.5 Performance Check Samples

An instrument performance check sample was analyzed at the beginning of each 24-hour period during sample analysis. The samples were analyzed within the 24-hour period. All ion abundance criteria were met for bromofluorobenzene (BFB).

### 1.6 Blanks

There were no detections of the project compounds of concern in the laboratory blank, with the exception of Isobutylene. However, since this compound was detected in samples RISV-51, RISV-52, and RISV-51 Dup at concentrations greater than 5 times the blank concentration, no sample qualifications were made. Isobutylene was detected in sample QCTB-1 at concentrations less than 5 times the blank concentration; therefore, the concentrations of Isobutylene in sample QCTB-1 is U qualified at an elevated reporting limit due to the associated blank concentration. Estimated levels of Toluene and Butane were also detected in QCTB-1; however, since the concentrations of these compounds were detected in samples RISV-51, RISV-52, and RISV-51 Dup at concentrations greater than 5 times the blank concentration, no sample qualifications were made.

Sample	Compound	Laboratory Result (ppbv)	Validation Result (ppbv)
QCTB-1	Isobutylene	0.026 B	0.026 U

B- Found in associated blank as well as sample

### 1.7 System Monitoring Compounds (Surrogates)

The surrogates employed, 1,2-Dichloroethane-d4, 4-Bromofluorobenzene, and Toluene-d8, are appropriate to the method. All surrogate recoveries met laboratory acceptance limits.

### 1.8 Laboratory Control Samples (LCS)

All LCS recoveries (LCS/LCS duplicate, LCSD) were within the control limits with the exception of MTBE which had low recoveries in both, 54% and 51% respectively. MTBE is J qualified as estimated in the associated samples.

It was noted that Isobutylene was not included in the LCS spike; as noted above, it was not included in the ICV either. Because Isobutylene was not included in the

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LCS/LCSD, the sample concentrations of Isobutylene are J qualified as estimated. Isobutylene was not qualified in sample QCTB-1 since the detection limit was raised due to blank contamination.

Additionally the LCS results were reported as the LCSD results and the LCSD results were reported as the LCS results. No qualifications were made to the data based on this.

Sample	Compound	Laboratory Result (ppbv)	Validation Result (ppbv)
RISV-51	Isobutylene	9.39	9.39 J
	MTBE	0.041 U	0.041 UJ
RISV-51 DUP	Isobutylene	9.53	9.53 J
	MTBE	0.041 U	0.041 UJ
RISV-52	Isobutylene	124	124 J
	MTBE	0.041 U	0.041 UJ

#### 1.12 Laboratory Duplicate Samples

Sample RISV-51 was analyzed as the laboratory duplicate. All duplicate relative percent difference (RPD) results were acceptable at  $\leq 30\%$ .

#### 2.0 Compound Identification and Quantitation

It was noted that no information on method detection limits (MDL) concentrations was provided by the laboratory in the original data package. The laboratory was contacted and provided the MDL documentation; the estimated qualifications by the laboratory were assessed and found to be appropriate.

All compound identifications and quantitations were found to be appropriate.

## Memorandum

Date: February 4, 2008  
To: Kevin Coffman and Robert Ettinger  
Copies to: Julia Klens Caprio  
From: GeoSyntec QA/QC Group  
Subject: Summary of Level IV Validation for Air Toxics Work Order # 0711121A and 0711121B for the Casmalia Hazardous Waste Management Facility Site

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### Introduction

This report summarizes the findings of the full validation of two soil gas samples and a blank soil gas sample. These samples were collected November 6, 2007 as part of the Casmalia Hazardous Waste Management Facility site investigation. The samples were analyzed by Air Toxics LTD, Folsom, California. The samples were analyzed for Volatile Organic Compounds by Modified TO-15 with a full scan and by Method ASTM D-1945 GC/FID. The data were reviewed in accordance with the principles presented in the *USEPA National Functional Guidelines for Laboratory Data Review, Organics* (EPA, 2005), EPA Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified method.

### Executive Summary

All samples were analyzed as requested. All holding times were met. Overall, the data are useable as qualified for their intended purpose based on the information provided.

### 1.0 Volatile Organic Compounds (TO15 MOD)

Full validation including recalculation was performed the laboratory data (samples RISV-53, RISV-54, and QCTB-1) for the analysis of volatile organic compounds (TO-15 Modified). The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Data Completeness
- ✓ Holding Times and Preservation
- ✓ Calibrations (full validation)
- ✓ Internal Standards (full validation)
- ✓ Performance Check Sample (full validation)
- ✓ Blanks
- ✓ System Monitoring Compounds (Surrogates)
- ⊗ Laboratory Control Samples
- ⊗ Laboratory Duplicate

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⊗ Compound Identification and Quantitation

1.1 Data Completeness

The chain of custody (COC) record requested EPA Method TO-15 SIM (Selective Ion Monitoring). EPA Method TO-15 in the full scan mode was the method used.

1.2 Holding Times and Preservation

The samples were analyzed within the 30-day technical holding time from date of collection for volatiles with no exceptions.

1.3 Calibrations

1.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSDs were within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ).

1.3.2 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ).

1.4 Internal Standards

All internal standard retention times are within  $\pm 30$  seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria ( $\pm 40\%$ ) of the associated continuing calibrations internal standard area counts.

1.5 Performance Check Samples

An instrument performance check sample was analyzed at the beginning of each 24-hour period during sample analysis. The samples were analyzed within the 24-hour period. All ion abundance criteria were met for bromofluorobenzene (BFB).

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**1.6 Blanks**

There were no detections of the project compounds of concern in any of the laboratory blanks. There were no detections of the project compounds of concern in sample QCTB-1.

**1.7 System Monitoring Compounds (Surrogates)**

The surrogates employed, 1,2-Dichloroethane-d4, 4-Bromofluorobenzene, and Toluene-d8, are appropriate to the method. All surrogate recoveries met laboratory acceptance limits.

**1.8 Laboratory Control Samples (LCS)**

All LCS recoveries were within the acceptance limits, with the following exception. There was low recovery outside of acceptance limits for 1,2,4-Trichlorobenzene. Therefore, the undetected concentrations of 1,2,4-Trichlorobenzene in the samples are UJ qualified as estimated.

It was noted that Isobutylene was not included in the LCS spike. Because Isobutylene was not included in the LCS, the undetected sample concentration of Isobutylene is UJ qualified as estimated less than the reporting limit; the detected concentrations of Isobutylene are J qualified as estimated.

<b>Sample</b>	<b>Compound</b>	<b>Laboratory Result (ppbv)</b>	<b>Validation Result (ppbv)</b>
RISV-53	1,2,4-Trichlorobenzene	0.72 U	0.72 UJ
	Isobutylene	22 E	22 J
RISV-54	1,2,4-Trichlorobenzene	0.74 U	0.74 UJ
	Isobutylene	38 E	38 J
RISV-54 Lab Dup	1,2,4-Trichlorobenzene	0.74 U	0.74 UJ
	Isobutylene	39 E	39 J
QCTB-1	1,2,4-Trichlorobenzene	0.50 U	0.50 UJ
	Isobutylene	0.50 U	0.50 UJ

E-Exceeds instrument calibration range

**1.13 Laboratory Duplicate Samples**

Sample RISV-54 was analyzed as the laboratory sample duplicate for the TO-15 list and Isobutylene analyses. The RPD between the results was compared to a criterion of  $\leq 30\%$ . Acceptable precision was demonstrated for the laboratory duplicate pair, with the following exception. Freon 11 in samples RISV-54 and RISV-54 Lab Dup are J qualified as estimated due to the RPD result.

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Sample	Compound	Laboratory Result (ppbv)	RPD (%)	Validation Result (ppbv)
RISV-54	Chloromethane	0.20	5	NA
RISV-54 Lab Dup		0.21		NA
RISV-54	1,3-Butadiene	2.9	3	NA
RISV-54 Lab Dup		3.0		NA
RISV-54	Freon 11	0.15 U	200	0.15 UJ
RISV-54 Lab Dup		0.26		0.26 J
RISV-54	Ethanol	6.9	3	NA
RISV-54 Lab Dup		6.7		NA
RISV-54	Acetone	47	2	NA
RISV-54 Lab Dup		46		NA
RISV-54	2-Propanol	1.8	15	NA
RISV-54 Lab Dup		2.1		NA
RISV-54	Carbon Disulfide	1.5	6	NA
RISV-54 Lab Dup		1.6		NA
RISV-54	Hexane	2.5	0	NA
RISV-54 Lab Dup		2.5		NA
RISV-54	2-Butanone	16	0	NA
RISV-5 Lab Dup		16		NA
RISV-54	Cyclohexane	0.62 J	NA	NA
RISV-54 Lab Dup		0.56 J		NA
RISV-54	Benzene	3.3	0	NA
RISV-54 Lab Dup		3.3		NA
RISV-54	Heptane	2.0	0	NA
RISV-54 Lab Dup		2.0		NA
RISV-54	Trichloroethene	0.19	24	NA
RISV-54 Lab Dup		0.15		NA
RISV-54	4-Methyl-2-Pentanone	0.86	2	NA
RISV-54 Lab Dup		0.84		NA
RISV-54	Toluene	13	8	NA
RISV-54 Lab Dup		12		NA
RISV-54	Ethylbenzene	3.0	7	NA
RISV-54 Lab Dup		2.8		NA
RISV-54	m,p-Xylene	12	9	NA
RISV-54 Lab Dup		11		NA
RISV-54	o-Xylene	4.2	7	NA
RISV-54 Lab Dup		3.9		NA
RISV-54	Styrene	0.48	16	NA
RISV-54 Lab Dup		0.41		NA
RISV-54	4-Ethyltoluene	4.3	7	NA
RISV-54 Lab Dup		4.0		NA
RISV-54	1,3,5-Trimethylbenzene	1.3	8	NA
RISV-54 Lab Dup		1.2		NA
RISV-54	1,2,4-Trimethylbenzene	4.9	6	NA
RISV-54 Lab Dup		4.6		NA
RISV-54	Butane	13	0	NA

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RISV-54 Lab Dup		13		NA
RISV-54	Isobutylene	38 E	NA	38 J
RISV-54 Lab Dup		39 E		39 J

### 1.10 Compound Identification and Quantitation

All compound identifications and quantifications were found to be appropriate.

The concentrations of Isobutylene in samples RISV-53, RISV-54 and RISV-54 Lab duplicate were reported with the E qualifier, indicating the concentration exceeds the instrument calibration range. Therefore, the concentrations of Isobutylene in samples RISV-53, RISV-54 and RISV-54 Lab duplicate are J qualified as estimated.

Sample	Compound	Laboratory Result (ppbv)	Validation Result (ppbv)
RISV-53	Isobutylene	22 E	22 J
RISV-54	Isobutylene	38 E	38 J
RISV-54 Lab Dup	Isobutylene	39 E	39 J

E-Exceeds instrument calibration range

## 2.0 Isobutane (Method ASTM D-1945)

Full validation including recalculation was performed the laboratory data (samples RISV-53, RISV-54, and QCTB-1) for the analysis of Isobutane (ASTM D-1945 Modified). The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Data Completeness
- ✓ Holding Times and Preservation
- ✓ Calibrations (full validation)
- ✓ Blanks
- ✓ Laboratory Control Samples
- ⊗ Laboratory Duplicate
- ✓ Compound Identification and Quantitation

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2.1 Data Completeness

All analyses were performed as requested on the COC records.

2.2 Holding Times and Preservation

The samples were analyzed within the holding time.

2.3 Calibrations

2.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSDs were within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ).

2.3.2 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ).

2.4 Blanks

Isobutane was not detected in the associated method blank or sample QCTB-1.

2.5 Laboratory Control Sample (LCS)

The LCS recovery was within the laboratory acceptance criteria.

2.6 Laboratory Duplicate Sample

No laboratory duplicate was analyzed with the data set.

2.7 Compound Identification and Quantification

All compound identifications and quantifications were found to be appropriate.

## Memorandum

Date: January 28, 2008  
To: Kevin Coffman and Robert Ettinger  
Copies to: Julia Klens Caprio  
From: GeoSyntec QA/QC Group  
Subject: Summary of Level IV Validation for Alpha Woods Hole ETR 0711040 for the  
Casmalia Hazardous Waste Management Facility Site

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### Introduction

This report summarizes the findings of the full validation of two soil gas samples and a blank soil gas sample. These samples were collected November 6, 2007 as part of the Casmalia Hazardous Waste Management Facility site investigation. The soil gas samples were analyzed by Alpha Woods Hole Laboratory, Mansfield, Massachusetts. The samples were analyzed for Volatile Organic Compounds by Alpha Woods Hole Lab SOP *Determination of PIANO Volatile Organic Compounds in Ambient Air and Soil Vapor Using Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (Revision 1.0) Method TO-15, modified*. The data were reviewed in accordance with the principles presented in the *USEPA National Functional Guidelines for Laboratory Data Review, Organics* (EPA, 2005), EPA Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified method.

### Executive Summary

All samples were analyzed as requested. All holding times were met. Overall, the data as qualified are useable for their intended purpose.

### 1.0 Volatile Organic Compounds (PIANO – TO15 MOD)

Full validation including recalculation was performed the laboratory data (samples RISV-53, RISV-54, and QCTB-1) for the analysis of volatile organic compounds (PIANO-TO15 SOP). The volatile organic compound list consisted of MTBE, Hexane, Cyclohexane, Benzene, Heptane, Toluene, Ethylbenzene, p/m-Xylene, Butane, 1,3-Butadiene, Styrene, o-Xylene, Isobutylene, and 1,3,5-Trimethylbenzene. The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

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- ⊗ Data Completeness
- ✓ Holding Times and Preservation
- ✓ Calibrations (full validation)
- ⊗ Internal Standards (full validation)
- ✓ Performance Check Sample (full validation)
- ⊗ Blanks
- ✓ System Monitoring Compounds (Surrogates)
- ⊗ Laboratory Control Samples
- ⊗ Compound Identification and Quantitation

### 1.1 Data Completeness

All analyses were performed as requested on the chain of custody (COC) records with the exception of the request of Isobutane analysis. Isobutane results were not reported with this data set.

It was noted during the data validation process that manual integrations were performed on the initial calibration and continuing calibration standards; however, appropriate documentation (before and after chromatograms) were not included in the original data package. Manual integrations were requested and received from the lab and found to be appropriate.

Isobutylene was not added to the laboratory control spike or laboratory control spike duplicate, nor was it added to the initial calibration verification resulting in the qualification of isobutylene results.

### 1.2 Holding Times and Preservation

The samples were analyzed within the 30-day technical holding time from date of collection for volatiles with no exceptions.

### 1.3 Calibrations

#### 1.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSDs were within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ).

#### 1.3.2 Initial Calibration Verification (ICV)

An ICV was analyzed; all target analytes had relative response factors (RRFs) greater than 0.05 and the percent differences (%D) between the RRFs in the initial calibration standards and the ICV were within acceptance criteria ( $\pm 30\%$  difference). It was noted that Isobutylene was not included in the ICV standard; however, no sample qualifications were made.

#### 1.3.3 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ) with the following exceptions; for CCV CA1111302 - MTBE and 1,3,5-Trimethylbenzene (1,3,5-TMB) were outside of the acceptance criteria with

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low responses (31.9 % and 33.7% respectively) and for CCV CA1111303 MTBE had a low response (31.1%). Based on these QC results the following qualifications were made to the data:

Sample ID	Compound	Laboratory Result (ppbv)	Validated Result
RISV-53	MTBE	1.25U	1.25UJ
	1,3,5-TMB	0.990	0.990 J
RISV-54	MTBE	1.25U	1.25UJ
	1,3,5-TMB	0.660	0.695 J
RISV-54	MTBE	1.25U	1.25UJ
Duplicate	1,3,5-TMB	0.695	0.695 J
QCTB-1	MTBE	0.025U	0.025UJ
	1,3,5-TMB	0.025U	0.025UJ

#### 1.4 Internal Standards

All internal standard retention times are within  $\pm 30$  seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria ( $\pm 40\%$ ) of the associated continuing calibrations internal standard area counts with the following exception; Sample RISV-54 Duplicate, all three internal standards were high and outside of the QC criteria resulting in the following qualifications (non-detect results were not impacted):

Sample ID	Compound	Laboratory Result (ppbv)	Validated Result
RISV-54 Duplicate	MTBE	0.125 U	NA
	Hexane	2.13	2.13J
	Cyclohexane	0.530	0.530J
	Benzene	2.00	2.00J
	Heptane	1.32	1.32J
	Toluene	6.48	6.48J
	Ethylbenzene	1.54	1.54J
	p/m-Xylene	6.32	6.32J
	Butane	14.4	14.4J

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	1,3-Butadiene	3.76	3.76J
	Styrene	0.190	0.190J
	o-Xylene	2.13	2.13J
	Isobutylene	25.8	25.8J
	1,3,5-TMB	0.695	0.695J

NA= not applicable

#### 1.5 Performance Check Samples

An instrument performance check sample was analyzed at the beginning of each 24-hour period during sample analysis. The samples were analyzed within the 24-hour period. All ion abundance criteria were met for bromofluorobenzene (BFB).

#### 1.6 Blanks

There were no detections of the project compounds of concern in the laboratory blank, with the exception of Butane and Isobutylene. However, since these compounds were detected in samples RISV-53, RISV-54, and RISV-54 Dup at concentrations greater than 5 times the blank concentration, no sample qualifications were made. Isobutylene and butane were detected in sample QCTB-1 at concentrations less than 5 times the blank concentration; therefore, the concentrations of Isobutylene and Butane in sample QCTB-1 are U qualified at at the reporting limit and at an elevated reporting limit respectively due to the associated blank concentration. Estimated levels of Toluene and Benzene were also detected in QCTB-1; however, since the concentrations of these compounds were detected in samples RISV-53, RISV-54, and RISV-54 Dup at concentrations greater than 5 times the blank concentration, no sample qualifications were made.

Sample	Compound	Laboratory Result (ppbv)	Validation Result (ppbv)
QCTB-1	Isobutylene	0.035 B	0.035 U
	Butane	0.014 JB	0.025 U

B- Found in associated blank as well as sample

#### 1.7 System Monitoring Compounds (Surrogates)

The surrogates employed, 1,2-Dichloroethane-d4, 4-Bromofluorobenzene, and Toluene-d8, are appropriate to the method. All surrogate recoveries met laboratory acceptance limits with the exception of Sample RISV-54 Duplicate, 1,2-Dichloroethane-d4 was outside of the QC criteria (66%). Based on professional judgment, no additional qualifications were applied to the data.

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1.8 Laboratory Control Samples (LCS)

All LCS recoveries (LCS/LCS duplicate, LCSD) were within the control limits.

It was noted that Isobutylene was not included in the LCS spike; as noted above, it was not included in the ICV either. Because Isobutylene was not included in the LCS/LCSD, the sample concentrations of Isobutylene are J qualified as estimated. Isobutylene was not qualified in sample QCTB-1 since the detection limit was raised due to blank contamination.

Sample	Compound	Laboratory Result (ppbv)	Validation Result (ppbv)
RISV-53	Isobutylene	10.9	10.9 J
RISV-54	Isobutylene	29.1	29.1 J
RISV-54 DUP	Isobutylene	25.8	25.8 J

B- Found in associated blank as well as sample

1.9 Laboratory Duplicate Samples

Sample RISV-54 was analyzed as the laboratory duplicate. All duplicate relative percent difference (RPD) results were acceptable at  $\leq 30\%$ .

2.0 Compound Identification and Quantitation

It was noted that no information on method detection limits (MDL) concentrations was provided by the laboratory in the original data package. The laboratory was contacted and provided the MDL documentation; the estimated qualifications by the laboratory were assessed and found to be appropriate.

All compound identifications and quantitations were found to be appropriate.

## Memorandum

Date: February 4, 2008  
To: Kevin Coffman and Robert Ettinger  
Copies to: Julia Klens Caprio  
From: GeoSyntec QA/QC Group  
Subject: Summary of Level IV Validation for Air Toxics Work Order # 0711198A and 0711198B for the Casmalia Hazardous Waste Management Facility Site

---

### Introduction

This report summarizes the findings of the full validation of one soil gas sample and a blank soil gas sample. These samples were collected November 8, 2007 as part of the Casmalia Hazardous Waste Management Facility site investigation. The samples were analyzed by Air Toxics LTD, Folsom, California. The samples were analyzed for Volatile Organic Compounds by Modified TO-15 with a full scan and by Method ASTM D-1945 GC/FID. The data were reviewed in accordance with the principles presented in the *USEPA National Functional Guidelines for Laboratory Data Review, Organics* (EPA, 2005), EPA Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified method.

### Executive Summary

All samples were analyzed as requested. All holding times were met. Overall, the data are useable as qualified for their intended purpose based on the information provided.

### 1.0 Volatile Organic Compounds (TO15 MOD)

Full validation including recalculation was performed the laboratory data (samples RISV-55 and QCTB-2) for the analysis of volatile organic compounds (TO-15 Modified). The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Data Completeness
- ✓ Holding Times and Preservation
- ✓ Calibrations (full validation)
- ✓ Internal Standards (full validation)
- ✓ Performance Check Sample (full validation)
- ✓ Blanks
- ✓ System Monitoring Compounds (Surrogates)
- ⊗ Laboratory Control Samples
- ⊗ Laboratory Duplicate
- ✓ Compound Identification and Quantitation

#### 1.1 Data Completeness

The chain of custody (COC) record requested EPA Method TO-15 SIM (Selective Ion Monitoring). EPA Method TO-15 in the full scan mode was the method used.

#### 1.2 Holding Times and Preservation

The samples were analyzed within the 30-day technical holding time from date of collection for volatiles with no exceptions.

#### 1.3 Calibrations

##### 1.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSDs were within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ).

##### 1.3.2 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ).

#### 1.4 Internal Standards

All internal standard retention times are within  $\pm 30$  seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria ( $\pm 40\%$ ) of the associated continuing calibrations internal standard area counts.

#### 1.5 Performance Check Samples

An instrument performance check sample was analyzed at the beginning of each 24-hour period during sample analysis. The samples were analyzed within the 24-hour period. All ion abundance criteria were met for bromofluorobenzene (BFB).

### 1.6 Blanks

There were no detections of the project compounds of concern in any of the laboratory blanks. There were no detections of the project compounds of concern in sample QCTB-2.

### 1.7 System Monitoring Compounds (Surrogates)

The surrogates employed, 1,2-Dichloroethane-d4, 4-Bromofluorobenzene, and Toluene-d8, are appropriate to the method. All surrogate recoveries met laboratory acceptance limits.

### 1.8 Laboratory Control Samples (LCS)

All LCS recoveries were within the acceptance limits, with the exception of high recoveries outside of acceptance limits for Bromomethane, Freon 113, 1,1-Dichloroethene and Acetone. However, since none of these compounds were detected in the samples, no sample qualifications were made.

Additionally, there was low recovery outside of acceptance limits for 1,2,4-Trichlorobenzene. Therefore, the undetected concentrations of 1,2,4-Trichlorobenzene in the samples are UJ qualified as estimated.

It was noted that Isobutylene was not included in the LCS spike. Because Isobutylene was not included in the LCS, the undetected sample concentration of Isobutylene is UJ qualified as estimated less than the reporting limit; the detected concentration of Isobutylene is J qualified as estimated.

<b>Sample</b>	<b>Compound</b>	<b>Laboratory Result (ppbv)</b>	<b>Validation Result (ppbv)</b>
RISV-55	1,2,4-Trichlorobenzene	36 U	36 UJ
	Isobutylene	36 U	36 UJ
QCTB-2	1,2,4-Trichlorobenzene	0.50U	0.50 UJ
	Isobutylene	0.50U	0.50 UJ

### 1.9 Laboratory Duplicate Samples

A laboratory duplicate was not analyzed.

### 1.10 Compound Identification and Quantitation

All compound identifications and quantifications were found to be appropriate.

## 2.0 Isobutane (Method ASTM D-1945)

Full validation including recalculation was performed the laboratory data (samples RISV-55 and QCTB-2) for the analysis of Isobutane (ASTM D-1945 Modified). The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Data Completeness
- ✓ Holding Times and Preservation
- ✓ Calibrations (full validation)
- ✓ Blanks
- ✓ Laboratory Control Samples
- ✓ Laboratory Duplicate
- ✓ Compound Identification and Quantitation

### 2.1 Data Completeness

All analyses were performed as requested on the COC records.

### 2.2 Holding Times and Preservation

The samples were analyzed within the holding time.

### 2.3 Calibrations

#### 2.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSDs were within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ).

#### 2.3.2 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ).

2.4 Blanks

Isobutane was not detected in the associated method blank or sample QCTB-2.

2.5 Laboratory Control Sample (LCS)

The LCS recovery was within the laboratory acceptance criteria.

2.6 Laboratory Duplicate Sample

Sample RISV-55 was analyzed as the laboratory sample duplicate. The RPD between the results was compared to a criterion of <30%. Acceptable precision was demonstrated for the laboratory duplicate pair.

2.7 Compound Identification and Quantification

All compound identifications and quantifications were found to be appropriate.

## Memorandum

Date: January 28, 2008  
To: Kevin Coffman and Robert Ettinger  
Copies to: Julia Klens Caprio  
From: GeoSyntec QA/QC Group  
Subject: Summary of Level IV Validation for Alpha Woods Hole ETR 0711048 for the  
Casmalia Hazardous Waste Management Facility Site

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### Introduction

This report summarizes the findings of the full validation of one soil gas sample. This sample was collected November 8, 2007 as part of the Casmalia Hazardous Waste Management Facility site investigation. The soil gas sample was analyzed by Alpha Woods Hole Laboratory, Mansfield, Massachusetts. The sample was analyzed for Volatile Organic Compounds by Alpha Woods Hole Lab SOP *Determination of PIANO Volatile Organic Compounds in Ambient Air and Soil Vapor Using Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (Revision 1.0) Method TO-15, modified*. The data were reviewed in accordance with the principles presented in the *USEPA National Functional Guidelines for Laboratory Data Review, Organics* (EPA, 2005), EPA Region 9 Superfund Data Evaluation/Validation Guidelines, and per the requirements of the specified method.

### Executive Summary

The sample was analyzed as requested. The holding time was met. Overall, the data as qualified are useable for their intended purpose.

### 1.0 Volatile Organic Compounds (PIANO – TO15 MOD)

Full validation including recalculation was performed the laboratory data (samples RISV-55) for the analysis of volatile organic compounds (PIANO-TO15 SOP). The volatile organic compound list consisted of MTBE, Hexane, Cyclohexane, Benzene, Heptane, Toluene, Ethylbenzene, p/m-Xylene, Butane, 1,3-Butadiene, Styrene, o-Xylene, Isobutylene, and 1,3,5-Trimethylbenzene. The laboratory data were reviewed to evaluate compliance with this method, and the quality of the data reported. The following summarizes the results of this review.

The areas of review are listed below. Those areas that were only reviewed as part of full validation & recalculation are designated below. A leading check mark (✓) indicates an area of review in which all data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

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- ⊗ Data Completeness
- ✓ Holding Times and Preservation
- ⊗ Calibrations (full validation)
- ✓ Internal Standards (full validation)
- ✓ Performance Check Sample (full validation)
- ⊗ Blanks
- ✓ System Monitoring Compounds (Surrogates)
- ⊗ Laboratory Control Samples
- ⊗ Laboratory Duplicate
- ✓ Compound Identification and Quantitation

### 1.1 Data Completeness

All analyses were performed as requested on the chain of custody (COC).

It was noted during the data validation process that manual integrations were performed on the initial calibration and continuing calibration standards; however, appropriate documentation (before and after chromatograms) were not included in the original data package. However, the manual integrations were requested and received from the lab and found to be appropriate.

Isobutylene was not added to the laboratory control spike or laboratory control spike duplicate, nor was it added to the initial calibration verification resulting in the qualification of isobutylene results.

### 1.2 Holding Times and Preservation

The samples were analyzed within the 30-day technical holding time from date of collection for volatiles with no exceptions.

### 1.3 Calibrations

#### 1.3.1 Initial Calibrations (IC)

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the %RSDs were within acceptance criteria ( $\pm 30\%$  and the method allowed 2 compounds with acceptance criteria  $\pm 40\%$ ).

#### 1.3.2 Initial Calibration Verification (ICV)

An ICV was analyzed; all target analytes had relative response factors (RRFs) greater than 0.05 and the percent differences (%D) between the RRFs in the initial calibration standards and the ICV were within acceptance criteria ( $\pm 30\%$  difference). It was noted that Isobutylene was not included in the ICV standard; however, no sample qualifications were made.

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### 1.3.3 Continuing Calibration Verification (CCV)

For all target analytes, the relative response factors (RRFs) were greater than 0.05 and the percent deviations (%D) were within acceptance criteria ( $\pm 30\%$ ) with the following exceptions; for CCV CA1111302 - MTBE and 1,3,5-Trimethylbenzene (1,3,5-TMB) were outside of the acceptance criteria with low responses (31.9 % and 33.7% respectively) and for CCV CA1111303 MTBE had a low response (31.1%). Based on these QC results the following qualifications were made to the data:

Sample ID	Compound	Laboratory Result (ppbv)	Validated Result
RISV-55	MTBE	1.25U	1.25UJ
	1,3,5-TMB	0.075J	0.075UJ

UJ = estimated less than the reporting limit J = estimated

### 1.4 Internal Standards

All internal standard retention times are within  $\pm 30$  seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria ( $\pm 40\%$ ) of the associated continuing calibrations internal standard area counts.

### 1.5 Performance Check Samples

An instrument performance check sample was analyzed at the beginning of each 24-hour period during sample analysis. The samples were analyzed within the 24-hour period. All ion abundance criteria were met for bromofluorobenzene (BFB).

### 1.6 Blanks

There were no detections of the project compounds of concern in the laboratory blank, with the exception of Butane and Isobutylene. However, since these compounds were detected in samples RISV-55, at a concentration greater than 5 times the blank concentration or reported at an elevated detection limit, no sample qualifications were made.

### 1.7 System Monitoring Compounds (Surrogates)

The surrogates employed, 1,2-Dichloroethane-d4, 4-Bromofluorobenzene, and Toluene-d8, are appropriate to the method. All surrogate recoveries met laboratory acceptance limits.

### 1.8 Laboratory Control Samples (LCS)

All LCS recoveries (LCS/LCS duplicate, LCSD) were within the control limits.

It was noted that Isobutylene was not included in the LCS spike; as noted above, it was not included in the ICV either. Because Isobutylene was not included in the LCS/LCSD, the sample concentrations of Isobutylene are J qualified as estimated. Isobutylene was not qualified in sample QCTB-1 since the detection limit was raised due to blank contamination.

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<b>Sample</b>	<b>Compound</b>	<b>Laboratory Result (ppbv)</b>	<b>Validation Result (ppbv)</b>
RISV-55	Isobutylene	0.125 U	0.125 UJ

1.9 Laboratory Duplicate Samples

A sample duplicate was not analyzed with this data set.

2.0 Compound Identification and Quantitation

It was noted that no information on method detection limits (MDL) concentrations was provided by the laboratory in the original data package. The laboratory was contacted and provided the MDL documentation; the estimated qualifications by the laboratory were assessed and found to be appropriate.

All compound identifications and quantitations were found to be appropriate.