Tier III Data Validation Report Summary

Client: Chevron Environmental Management Company	Laboratory: Air Toxics Limited (LTD)
Project Name: Risk Assessment/Hooven Vapor Investigation	Sample Matrix: Vapor
Project Number: 500-016-012	Sample Start Date: September 29, 2009
Date Validated: October 23, 2009	Sample End Date: September 30, 2009
Parameters: Volatile Organic Compounds (VOCs) by Modified Method TO-15, and Fixed Gases with Helium by Modified American Society for Testing of Materials (ASTM) D-1946	
Laboratory Project IDs: 0910195A (TO-15), 0910195B (TO-15), 0910195C (ASTM D-1946), and 0910195D (ASTM D-1946)	
Data Validator: Justin Hildenbrand, Environmental Chemist	

DATA EVALUATION CRITERIA SUMMARY

A Tier III Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services group on the analytical data report package generated by Air Toxics LTD evaluating samples from the Chevron Site located in Cincinnati, Ohio.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values of samples from field duplicate pairs and laboratory duplicate pairs. Laboratory accuracy was established by reviewing the demonstrated percent recovery of laboratory control samples (LCS) to verify that none of the data were biased. Additionally, field accuracy was established by collecting trip blanks to monitor for possible ambient or cross contamination during sampling. Method compliance was established by reviewing holding times, detection limits, surrogate recoveries, method blanks, and LCS percent recoveries against method specific requirements. Completeness was evaluated by determining the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody, laboratory analytical methods, and all other necessary documents associated with this analytical data set.

Data were evaluated in general accordance with validation criteria set forth in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review, document number USEPA-540-R-08-01, June 2008, with additional reference to USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99-008 of October 1999 and the USEPA CLP National Functional Guidelines (NFG) for Inorganic Data Review, document number EPA 540R-04-004, October 2004. Review of duplicates is conducted in accordance with USEPA Region 1 Laboratory Data Validation Functional Guidelines for Evaluation of Organic Analysis, December 1996 or as specified by the method. In addition to the above mentioned guidance documents, the USEPA Hazardous Waste Support Branch Validating Air Samples Volatile Organic Analysis of Ambient Air in Canister by Method TO-15, SOP # HW-31, October 2006, document and the applicable methods were used for verification of the data.

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SAMPLE NUMBERS TABLE

Client Sample ID	Sample Number Method TO-15	Sample Number Method ASTM D-1946
TB-1, 092909	0910195A-01A	0910195C-01A
VW-130(20)-092909	0910195A-02A	0910195C-02A
VW-130(15) -092909	0910195A-03A	0910195C-03A
VW-130(10) -092909	0910195A-04A	0910195C-04A
VW-130(5) -092909	0910195A-05A	0910195C-05A
VW-130(5) -092909 Lab Duplicate	0910195A-05AA	Not Applicable
VW-130(40) -092909	0910195A-06A	0910195C-06A
VW-128(50) -092909	0910195A-07A	0910195C-07A
VW-128(40) -092909	0910195A-08A	0910195C-08A
VW-128(30) -093009	0910195A-09A	0910195C-09A
VW-128(20) -093009	0910195A-10A	0910195C-10A
VW-128(20) -093009 Lab Duplicate	0910195A-10AA	Not Applicable
VW-139(5) -093009	0910195A-11A	0910195C-11A
VW-139(5) -093009 Lab Duplicate	Not Applicable	0910195C-11AA
BD-2-092909	0910195B-12A	0910195D-12A
VW-129(50) -092909	0910195B-13A	0910195D-13A
VW-129(40) -092909	0910195B-14A	0910195D-14A
VW-129(40) -092909 Lab Duplicate	0910195B-14AA	Not Applicable
VW-129(30) -092909	0910195B-15A	0910195D-15A
VW-129(30) -092909 Lab Duplicate	0910195B-14AA	Not Applicable
VW-129(20) -092909	0910195B-16A	0910195D-16A
VW-129(10) -092909	0910195B-17A	0910195D-17A
VW-129(5) -092909	0910195B-18A	0910195D-18A
VW-129(15) -092909	0910195B-19A	0910195D-19A
VW-129(15) -092909 Lab Duplicate	Not Applicable	0910195D-19AA
VW-130(30) -092909	0910195B-20A	0910195D-20A
BD1-092909	0910195B-21A	0910195D-21A

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The samples were analyzed for client-specified analytes. The samples were shipped to Air Toxics LTD under chain-of-custody (COC) documents included for work order 0910195. The laboratory data were reviewed to evaluate compliance with the required methods and the quality of the reported data. A leading check mark (✓) indicates that the referenced data was deemed acceptable. A preceding crossed circle (⊗) signifies problems with the referenced data that may have warranted attaching qualifiers to the data.

- ✓ Data Completeness
- ✓ COC Documentation
- ✓ Holding Times and Preservation
- ✓ Laboratory Blanks
- ⊗ Initial and Continued Calibrations
- ✓ Instrument Calibrations
- ✓ System Monitoring Compounds (i.e. Surrogates)
- ⊗ Laboratory Control Samples (LCS)
- ⊗ Field Duplicates
- ✓ Laboratory Duplicate
- ✓ Trip Blank

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered. Air Toxics LTD qualified a total of one data point with a J data flag in data set 0910195B. The laboratory assigned data qualifier was reviewed and found to be valid and correct. The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data which are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an "R", the data may be used for site evaluation, with the reasons for qualification being given consideration when interpreting sample concentrations. Data points which are assigned an "R" qualifier should not be used for any site evaluation purposes. The laboratory qualified one data point with a J flag, indicating estimated data. Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. A total of 54 additional data points were qualified with J or UJ data flags as a result of this data validation review. Some of the qualified data points are useful only for qualitative purposes with the professional judgment of the project manager and associated technical staff. Data were qualified due to high field duplicate RPD values, TO-15 calibration data outside of acceptable limits, and low LCS recoveries in the TO-15 analyses.

Data qualifiers used during this validation included:

J – Estimated concentration

UJ – Estimated reporting limit

Data Completeness

All analyses were performed as requested on the chain-of-custody records. All samples were received by the laboratory and analyzed properly. Excluding the trip blank sample, the complete data package consisted of 1520 data points, total. No data points were rejected. The data completeness measure for this data package is 100% and is acceptable.

TABLE 1. GENERAL VALIDATION CRITERIA CHECKLIST	
1. Was the report free of non-conformances related to the analytical data identified by the laboratory?	No

Comments: The laboratory listed the following non-conformances related to the analytical data.

Modified Method TO-15

Data sets 0910195A and 0910195B: The reported CCV for each daily batch may be derived from more than one analytical file due to the client's request for non-standard compounds.

Non-standard compounds may have different acceptance criteria than the standard TO-14A/TO-15 compound list as per contract or verbal agreement.

Data set 0910195B: All Quality Control Limit failures and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

The laboratory noted the following for the initial calibrations.

Data Set 09010195A:

A 7 point initial calibration was analyzed on MSD-D on 10/7/2009

The following compounds used 0.3 as the lowest calibration concentration: 1.3-Butadiene, Chloroform, Benzene, 1,2-Dibromoethane, Styrene, Cumene, 1,3,5-Trimethylbenzene and 1,2,4-Trimethylbenzene

A 3pt [three-point calibration] for Aerojet was performed at 2, 50, and 200 ppbv on 10/16/2009

Data Set 09010195B:

A 7 point initial calibration was analyzed on MSD-X on 8/21/2009

The following compounds used 0.3ppbv as the lowest calibration concentration:

1. 1,3-Butadiene
2. Chloroform
3. 1,2-Dibromoethane
4. Styrene
5. Cumene
6. 1,3,5-Trimethylbenzene
7. 1,2,4-Trimethylbenzene
8. Benzene

A 3pt [three point calibration] curve for Methanol was performed at 45, 600, and 1200 ppbv on 8/24/2009.
A 3pt [three point calibration] curve for Aerojet was performed at 2, 50, and 200ppbv on 9/17/2009 (no Butyl benzene).
A 3pt [three point calibration] curve for 2-Methylnaphthalene was performed at 10, 25, and 50ppbv on 9/18/2009.
A 5pt [five point calibration] curve for Butyl benzene was performed at 2, 25, 50, 100, and 200 ppbv on 9/18/2009.
A 3pt [three point calibration] curve for Methanol was performed at 45, 187.5, and 600ppbv on 10/5/2009.
A 3pt [three point calibration] curve for Ethyl Acetate was performed at 2, 50, and 200ppbv on 10/14/2009.
A 3pt [three point calibration] curve for Octane was performed at 2, 50, and 200ppbv on 10/15/2009.
A 4pt [four point calibration] curve for Acrolein was performed at 2, 10, 25, and 50ppbv on 10/15/2009.
A 4pt [four point calibration] curve for AT Special was performed at 2, 5, 50, and 200ppbv on 10/15/2009.

Modified Method ASTM D-1946

On the analytical column employed for this analysis, Oxygen coelutes with Argon. The corresponding peak is quantitated as Oxygen.

Since Nitrogen is used to pressurize samples, the reported Nitrogen values are calculated by adding all the sample components and subtracting from 100%.

Data set 0910195C: The trip blank sample TB-1, 092909 has reportable level of oxygen present.

The laboratory noted the following for the initial calibrations.

Data Set 09010195C and 09010195D:

A 7 point initial calibration was analyzed on GC-9 on 04/29/2009. As noted on the accompanying analytical run log, calibration level 6 was reanalyzed due to an unacceptable linearity for compound Butane.

TABLE 1. GENERAL VALIDATION CRITERIA CHECKLIST	
2. Were data qualification flags used by the laboratory? If yes, define.	Yes
Comments: The following data qualifier flag was used by the laboratory. J – Estimated value Q – Exceeds quality control limits	
3. Were sample COC forms complete?	Yes
Comments: The COC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.	
4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable by the Tier I validator?	Yes
Comments: Detection limits were reviewed and determined to be acceptable. For Method TO-15, the laboratory reported required dilutions between 2.20 and 2.71 times. For Method ASTM D-1946, the laboratory reported required dilutions between 2.20 to 2.70 times.	
5. Were the requested analytical methods in compliance with the QAPP, permit, or COC?	Yes
Comments: The requested analytical methods were performed in accordance with the chain-of-custody forms.	
6. Were samples received in good condition within method specified requirements?	Yes
Comments: Samples were received intact and in good condition. The final vacuums from the field and receipt vacuums measured by the laboratory were compared and the vacuums appeared to be acceptable, with pressure/vacuum changes from the field to the laboratory less than five inches of mercury for each sample. The canisters used for sampling were 100% certified by the laboratory. The canister certification results were reviewed and found to be acceptable. The laboratory and field helium results were compared to evaluate the possible intrusion of ambient air into the sample canisters. The differences between the results were determined to be within acceptable limits. In addition, oxygen results were evaluated to determine acceptability of the data. For each sample, oxygen results were below 21% and were acceptable.	
7. Were samples analyzed within method specified or technical holding times?	Yes
Comments: The samples were analyzed within method specified holding times for analysis of Summa canisters and the respective methods.	
8. Were reported units appropriate for the associated sample matrix/matrices and method(s) of analyses?	Yes
Comments: The results for Method TO-15 were reported in units of part per billion by volume (ppbv) and micrograms per cubic meter ($\mu g/m^3$). The results for Method ASTM D-1946 for fixed gases were reported as percentages (%). These units are appropriate for the air matrix and for the methods used.	
9. Do the laboratory reports include all constituents requested to be reported as indicated by the Tier I validator?	Yes
Comments: The requested constituents were reported as requested.	
10. Were the field duplicates collected equal to at least 10% of the total number of samples, or as required by the project guidelines, QAPP, SAP, or permit, or as indicated by the Tier I validator?	Yes
Comments: Two field duplicates were collected for this sampling event, resulting in a collection frequency of 10% of the total number of samples. Sample BD1 was collected as a duplicate of sample VW-130 (40'). Sample BD-2 was collected as a duplicate of sample VW-129 (50').	

TABLE 1. GENERAL VALIDATION CRITERIA CHECKLIST	
11. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)?	No
Comments: Precision based on field duplicate RPD results was determined to be acceptable with one exception, summarized at the end of this section. Field duplicate RPD values are reported in the Field Duplicate Summary table at the end of this data validation review. Analytes where both the parent and duplicate samples were non-detect are omitted from the Field Duplicate Summary table since precision could not be assessed for these data. If an analyte was detected in one sample but not in the other sample for the duplicate pair, a valid RPD could not be calculated and the RPD was reported as DL. For analytes where both the parent and duplicate results were detected at less than two times the reporting limit, a valid RPD could not be calculated and the result was reported as +/- RL. **For the sample duplicate pair BD-2/VW-129 (50'), the RPD calculated for the analyte 2-butanone exceeded the data validation QC limit of 25% for air samples at 53.1%. As a result, 2-butanone was qualified J in the parent and duplicate samples due to possible poor precision.**	
12. Was the number of equipment, trip, or field blanks collected equal to at least 10% of the total number of samples, or as required by the project guidelines, QAPP, SAP, or permit, or as indicated by the Tier I validator?	No
Comments: One trip blank, TB-1, was collected and submitted with the samples reported in these laboratory reports, resulting in a collection frequency of less than 10% of the total number of samples. Equipment and field blanks were not collected with the reported samples.	
13. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination?	No
Comments: Oxygen was reported in the trip blank at 0.16%. The presence of oxygen in the trip blank indicates that the trip blank canister may have not sealed completely between preparation at the laboratory before sampling and analysis. Similar oxygen results were reported for other trip blank canisters analyzed for this sampling effort. Based on professional judgment, the severity of any potential leakage appeared insufficient to adversely affect the sample data, and no data were qualified based on this occurrence. Since other reported analytes were not detected in the trip blank sample, no further action was necessary.	

TABLE 2. VALIDATION CRITERIA CHECKLIST FOR VOC ANALYSES (TO-15 MODIFIED)	
1. Were instrument calibrations within method or data validation quality control (QC) limits?	No
Comments: Initial and continuing calibrations results were within acceptable limits, with the following exception. **In the initial calibration performed on August 21, 2009, through October 15. 2009, the %RSD for sec-butylbenzene associated with the samples reported in data set 09010195B was above the data validation limit of 30% at 31.760%. Data reported for sec-butylbenzene were non-detect for the associated samples, and therefore associated results were qualified UJ.** **In the continuing calibration verification (CCV) associated with data set 09010195B and performed on October 20, 2009, at 8:40 AM, the analytes bromoform and 4-ethyltoluene had percent difference values above the method limit of 30% at 33% and 34%, respectively. Associated data were qualified J for detections and UJ for non-detections.**	
2. Were the instrument tunes within method control limits?	Yes
Comments: Instrument tunes were within method control limits.	
3. Were the internal standards within method control limits?	No
Comments: Internal standard areas and retention times were within method control limits.	
4. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory blank samples were prepared at a frequency equal to at least 5% of the total number of samples.	
5. Were laboratory blank samples free of target analyte contamination?	Yes
Comments: Detections were not reported in the laboratory blanks.	
6. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: The LCS samples were analyzed at a frequency equal to at least 5% of the total number of samples.	
7. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within laboratory limits?	No
Comments: The LCS recoveries were within acceptable limits, with the following exceptions. **The LCS recoveries for ethanol for samples associated with data sets 0910195A and 0910195B were outside of the laboratory limits of 60-140% at 52% and 58%, respectively. Associated sample data were qualified J for detections and UJ for non-detections due to a possible low bias.**	
8. Was the total number of MS samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	No
Comments: Matrix spike samples were not prepared and are not required for analysis by Method TO-15 Modified.	
9. Were MS/MSD percent recoveries and MS/MSD RPDs within data validations or laboratory QC limits?	N/A
Comments: Matrix spike samples were not prepared and are not required for analysis by Method TO-15 Modified.	
10. Were surrogate recoveries within laboratory QC limits?	Yes
Comments: Surrogate recoveries were within laboratory QC limits.	
11. Were laboratory duplicate RPD values acceptable?	Yes
Comments: Laboratory duplicates were prepared from samples VW-130(5), VW-128(20), VW-129(40), and VW-129(30). Laboratory duplicate RPD values were within acceptable QC limits, were not calculated since one or both results were non-detect, or were not valid since the results for one or both samples were within five times the reporting limit.	

TABLE 3. VALIDATION CRITERIA CHECKLIST FOR HELIUM AND FIXED GAS ANALYSES (ASTM D-1946 MODIFIED)	
1. Were instrument calibrations within method or data validation QC limits?	Yes
Comments: The initial and continuing calibration verifications were within acceptable limits.	
2. Were the instrument tunes within method QC limits?	N/A
Comments: Instrument tunes are not required by Method ASTM D-1946 Modified.	
3. Were the internal standards within method QC limits?	N/A
Comments: Internal standards are not required by Method ASTM D-1946 Modified.	
4. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory blank samples were prepared at a frequency equal to at least 5% of the total number of samples.	
5. Were laboratory blank samples free of analyte contamination?	Yes
Comments: Detections were not reported in the laboratory blanks.	
6. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: The LCS samples were analyzed at a frequency equal to at least 5% of the total number of samples.	
7. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within laboratory QC limits?	Yes
Comments: The LCS percent recoveries were within laboratory QC limits.	
8. Was the total number of MS samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	N/A
Comments: Matrix spike samples were not prepared and are not required for analysis by Method ASTM D-1946 Modified.	
9. Were MS/MSD percent recoveries and MS/MSD RPDs within data validation or laboratory QC limits?	N/A
Comments: Matrix spike samples were not prepared and are not required for analysis by Method ASTM D-1946 Modified.	
10. Were surrogate recoveries within laboratory QC limits?	N/A
Comments: Surrogates are not required for analysis by Method ASTM D-1946 Modified.	
12. Were laboratory duplicate RPD values acceptable?	Yes
Comments: Laboratory duplicates were prepared from samples VW-139(5) and VW-129(15). Laboratory duplicate RPD values were within acceptable QC limits.	

TABLE 4. DATA QUALIFICATION, CHEVRON SITE, CINCINNATI, OHIO (0910195A/B/C/D)

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
4-Ethyltoluene	BD-2-092909	0910195B-12A	ND(6 ug/m3)	UJ	% Difference above QC limit
4-Ethyltoluene	VW-129(50)-092909	0910195B-13A	ND(6.1 ug/m3)	UJ	% Difference above QC limit
4-Ethyltoluene	VW-129(40)-092909	0910195B-14A	ND(5.9 ug/m3)	UJ	% Difference above QC limit
4-Ethyltoluene	VW-129(30)-092909	0910195B-15A	ND(6.5 ug/m3)	UJ	% Difference above QC limit
4-Ethyltoluene	VW-129(20)-092909	0910195B-16A	ND(5.9 ug/m3)	UJ	% Difference above QC limit
4-Ethyltoluene	VW-129(10)-092909	0910195B-17A	ND(5.9 ug/m3)	UJ	% Difference above QC limit
4-Ethyltoluene	VW-129(5)-092909	0910195B-18A	ND(5.9 ug/m3)	UJ	% Difference above QC limit
4-Ethyltoluene	VW-129(15)-092909	0910195B-19A	ND(6.1 ug/m3)	UJ	% Difference above QC limit
4-Ethyltoluene	VW-130(30)-092909	0910195B-20A	ND(5.7 ug/m3)	UJ	% Difference above QC limit
4-Ethyltoluene	BD1-092909	0910195B-21A	ND(6.7 ug/m3)	UJ	% Difference above QC limit
Bromoform	BD-2-092909	0910195B-12A	ND(13 ug/m3)	UJ	% Difference above QC limit
Bromoform	VW-129(50)-092909	0910195B-13A	ND(13 ug/m3)	UJ	% Difference above QC limit
Bromoform	VW-129(40)-092909	0910195B-14A	ND(12 ug/m3)	UJ	% Difference above QC limit
Bromoform	VW-129(30)-092909	0910195B-15A	ND(14 ug/m3)	UJ	% Difference above QC limit
Bromoform	VW-129(20)-092909	0910195B-16A	ND(12 ug/m3)	UJ	% Difference above QC limit
Bromoform	VW-129(10)-092909	0910195B-17A	ND(12 ug/m3)	UJ	% Difference above QC limit
Bromoform	VW-129(5)-092909	0910195B-18A	ND(12 ug/m3)	UJ	% Difference above QC limit
Bromoform	VW-129(15)-092909	0910195B-19A	ND(13 ug/m3)	UJ	% Difference above QC limit
Bromoform	VW-130(30)-092909	0910195B-20A	ND(12 ug/m3)	UJ	% Difference above QC limit
Bromoform	BD1-092909	0910195B-21A	ND(14 ug/m3)	UJ	% Difference above QC limit
sec-Butylbenzene	BD-2-092909	0910195B-12A	ND(27 ug/m3)	UJ	% RSD above QC limit
sec-Butylbenzene	VW-129(50)-092909	0910195B-13A	ND(27 ug/m3)	UJ	% RSD above QC limit
sec-Butylbenzene	VW-129(40)-092909	0910195B-14A	ND(26 ug/m3)	UJ	% RSD above QC limit
sec-Butylbenzene	VW-129(30)-092909	0910195B-15A	ND(29 ug/m3)	UJ	% RSD above QC limit
sec-Butylbenzene	VW-129(20)-092909	0910195B-16A	ND(26 ug/m3)	UJ	% RSD above QC limit
sec-Butylbenzene	VW-129(10)-092909	0910195B-17A	ND(26 ug/m3)	UJ	% RSD above QC limit
sec-Butylbenzene	VW-129(5)-092909	0910195B-18A	ND(26 ug/m3)	UJ	% RSD above QC limit
sec-Butylbenzene	VW-129(15)-092909	0910195B-19A	ND(27 ug/m3)	UJ	% RSD above QC limit
sec-Butylbenzene	VW-130(30)-092909	0910195B-20A	ND(26 ug/m3)	UJ	% RSD above QC limit
sec-Butylbenzene	BD1-092909	0910195B-21A	ND(30 ug/m3)	UJ	% RSD above QC limit

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Acetone	VW-129(10)-092909	0910195B-17A	11 ug/m3	J	Flagged by the Laboratory.
2-Butanone	BD-2-092909	0910195B-12A	5.2 ug/m3	J	High field duplicate RPD value
2-Butanone	VW-129(50)-092909	0910195B-13A	9 ug/m3	J	High field duplicate RPD value
Ethanol	TB-1, 092909	0910195A-01A	ND(3.8 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-130(20)-092909	0910195A-02A	ND(9 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-130(15)-092909	0910195A-03A	ND(8.6 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-130(10)-092909	0910195A-04A	ND(8.8 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-130(5)-092909	0910195A-05A	ND(8.9 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-130(40)-092909	0910195A-06A	ND(10 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-128(50)-092909	0910195A-07A	ND(8.7 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-128(40)-092909	0910195A-08A	ND(8.7 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-128(30)-093009	0910195A-09A	ND(8.7 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-128(20)-093009	0910195A-10A	13 ug/m3	J	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-139(5)-093009	0910195A-11A	ND(8.4 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	BD-2-092909	0910195B-12A	ND(9.2 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-129(50)-092909	0910195B-13A	ND(9.3 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Ethanol	VW-129(40)-092909	0910195B-14A	ND(9.1 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-129(30)-092909	0910195B-15A	ND(9.9 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-129(20)-092909	0910195B-16A	ND(9 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-129(10)-092909	0910195B-17A	ND(9 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-129(5)-092909	0910195B-18A	ND(9.1 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-129(15)-092909	0910195B-19A	ND(9.3 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	VW-130(30)-092909	0910195B-20A	ND(8.8 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.
Ethanol	BD1-092909	0910195B-21A	ND(10 ug/m3)	UJ	The LCS and/or LCSD recovery(ies) were below the acceptable limits indicating a possible low bias.

TABLE 5. FIELD DUPLICATE SUMMARY, CHEVRON SITE, CINCINNATI, OHIO (0910195B/D)

Client Sample ID: BD1 Field Duplicate Sample ID: VW-130 (40')			
Analyte	**Laboratory Result**	**Duplicate Result**	**Relative Percent Difference (RPD)**
2-Butanone (Methyl Ethyl Ketone)	4.6 µg/m3	6.2 µg/m3	+/- RL
Acetone	27 µg/m3	31 µg/m3	13.8%
Freon 12	11 µg/m3	7.1 µg/m3	+/- RL
Tetrahydrofuran	4.8 µg/m3	ND(4 µg/m3)	DL
Carbon Dioxide	2.5%	2.4%	4.1%
Nitrogen	82%	83%	1.2%
Oxygen	15%	15%	0.0%

Field duplicate RPD control limits should not exceed 30% for water, 50% for soil, or 25% for air or vapor as established by USEPA Region 1 Laboratory Data Validation Function Guidelines for Evaluation of Organic Analysis, December 1996.

DL – Indicates that one result was detected and one was non-detect. An RPD could not be calculated. No data were qualified since the detections were within two times the reporting limit.

+/-RL – Indicates that the detections in the samples are within two times the reporting limit. No qualification of data is required.

TABLE 6. FIELD DUPLICATE SUMMARY, CHEVRON SITE, CINCINNATI, OHIO (0910195B/D)

Client Sample ID: VW-129 (50') Field Duplicate Sample ID: BD-2			
Analyte	**Laboratory Result**	**Duplicate Result**	**Relative Percent Difference (RPD)**
1,1,1-Trichloroethane	10 µg/m3	11 µg/m3	+/- RL
2-Butanone (Methyl Ethyl Ketone)	9 µg/m3	5.2 µg/m3	**53.5%**
Acetone	26 µg/m3	24 µg/m3	8.0%
Carbon Tetrachloride	8.4 µg/m3	7.7 µg/m3	+/- RL
Freon 11	15 µg/m3	15 µg/m3	0.0%
Freon 12	8.7 µg/m3	9 µg/m3	+/- RL
Carbon Dioxide	3.4%	3.3%	3.0%
Nitrogen	81%	81%	0.0%
Oxygen	16%	16%	0.0%

Field duplicate RPD control limits should not exceed 30% for water, 50% for soil, or 25% for air or vapor as established by USEPA Region 1 Laboratory Data Validation Function Guidelines for Evaluation of Organic Analysis, December 1996. **The RPD for 2-butanone exceeded the data validation QC limit of 25% for air samples. This analyte was qualified J in both the parent and duplicate samples due to possible poor precision.**

+/-RL – Indicates that the detections in the samples are within two times the reporting limit. No qualification of data is required.