ENVIRONMENTAL DATA SERVICES, LTD.

DATA VALIDATION • TECHNICAL WRITING • CONSULTING • DATA INTERPRETATION

DIOXIN/FURANS
DATA VALIDATION REPORT

Lower Passaic River Study Area
Focused Sediment Investigation Work Plan (FSIWP)

Vista Analytical

(1, FSI001, FSI002, FSI003, FSI004, FSI005 and FSI006)

Prepared by

ENVIRONMENTAL DATA SERVICES, LTD.

For

TIERRA SOLUTIONS, INC.

May 18, 2012

2690 Oak Hill Drive, Allison Park, PA 15101
PHONE • 412-486-6989
E-MAIL • info@eds-us.net

Data Assessment Narratives

DATA VALIDATION REPORT FOR DIOXIN AND FURANS

SITE: Lower Passaic River Area, Focused Sediment Investigation Work Plan (FSIWP)

LABORATORY: Vista Analytical

SAMPLE DELIVERY GROUP: 1

This sample delivery group consists of the following sample:

Split Rinse Blanks 11312

The sample described above was analyzed via USEPA method 1613B to determine the concentrations of 2,3,7,8-substituted polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzo furans (PCDD/PCDFs) in water. This analytical procedure (indexed as standard operating procedure L-2) is located in Appendix B of the Focused Sediment Investigation Work Plan, Quality Assurance Project Plan, Lower Passaic River Study Area (FSIWP-QAPP).

Data validation SOP V-2 of the FSIWP-QAPP titled; USEPA Region II Data Validation SOP for EPA Method 1613, Revision B Tetra through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS), SOP HW-25, Rev. 3, September, 2006 was used to perform the dioxin and furan data validation.

All data qualification related to this group of samples is detailed on the attached sheets. Laboratory and data validation qualifiers and their related meanings are provided in the table located at the end of this report.

Major Data Quality Issues

None.

Minor Data Quality Issues

None.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable due to significant QC problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort.

Lastly, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Date: 5/18/12

Diane Waldschmidt
Environmental Scientist/Director

HOLDING TIME/SAMPLE HANDLING

The sample in this delivery group was prepared and analyzed within the holding time specified in the validation guideline.

CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

INITIAL CALIBRATION

Data was submitted representing six concentration level initial calibrations. All initial calibrations used during the analysis of samples in this delivery group were contained in the data package.

The validator has evaluated the initial calibrations examining ion ratios, signal to noise ratios, retention time and percent relative standard deviation criteria for all PCDD/PCDF target analytes and their labeled analogs.

Upon examination of the initial calibration data all of the criteria listed in method 1613B were met.

ROUTINE CALIBRATION

A routine calibration standard was evaluated at the beginning of each 12-hour analysis period.

The validator has evaluated the routine calibration standard data submitted examining ion ratios, retention time, signal to noise ratios, and concentration reported for all PCDD/PCDF target analytes and their labeled analogs.

Upon examination of the routine calibration data submitted, all of the criteria listed in method 1613B were met.

SAMPLE DATA

Qualitative Requirements

The one positive reported result met method and validation qualitative acceptance criteria.

Quantitative Requirements

Sample and internal standard concentration calculations were verified and no errors were detected.

Interferences

Positive PCDF values reported for the sample in this delivery group were evaluated to determine the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise. Upon evaluation, the chromatogram was found to be free of the presence of any diphenyl ether (at greater than 2.5 times background) within the retention time range of the target analyte polychlorinated dibenzofurans. Therefore no qualification is necessary on this basis.

BLANKS

Rinsate Blanks

The one sample contained in this sample delivery group (SDG) was a split rinsate blank. Upon evaluation of the result reported for the split rinse blank, all target PCDD/PCDFs were found to be not detected with the following exception:

Analyte	Units	Split Rinse Blank 11312
OCDF	pg/l	8.59

pg/l = picograms per liter

Method Blanks

A method blank was prepared and analyzed in association with this sample delivery group at the specified frequency. Upon examination of method blank data no analyte was positively identified at a concentration above or below the method defined minimum levels in any associated method blank.

FIELD DUPLICATE

The sample delivery group contains only a split rinsate blank. Therefore a field duplicate is not required.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

The matrix spike and matrix spike duplicate (MS/MSD) are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

This sample delivery group contains only a split rinsate blank. Therefore a matrix spike/matrix spike duplicate are not required.

INTERNAL STANDARD

Internal standards ($^{13}C_{12}$-1,2,3,4-TCDD, $^{13}C_{12}$-1,2,3,4-TCDF and $^{13}C_{12}$-1,2,3,7,8,9-HxCDF) are added to each sample and method blank extract prior to injection. The area counts for each of the recovery standards in each sample must fall within the range (+100% to –50%) percent of that observed during the analysis of the mid-level daily calibration check standard.

Upon evaluation all internal standard responses were within acceptable limits.

LABELED ANALOG STANDARDS

Calculated percent recoveries of labeled analog standards were within method and validation acceptance limits without exception.

OPR

Ongoing Precision and Recovery (OPR) standards were prepared and analyzed in association with the samples in this delivery group. All observed percent recoveries were within method 1613B allowable limits during the OPR determination.

IPR

Initial Precision and Recovery (IPR) standards were prepared and analyzed successfully by the laboratory. All observed average concentration and standard deviation values passed method defined acceptance criteria.

CLEAN-UP RECOVERY STANDARD

The clean-up recovery standard (^{37}Cl 2,3,7,8-TCDD) was successfully recovered from the sample in the delivery group.

SECOND COLUMN CONFIRMATION

No positive sample results (above the method defined minimum level) were identified for the following analytes in the delivery group.

2,3,7,8-TCDF
1,2,3,7,8-PeCDF
2,3,4,7,8-PeCDF
1,2,3,4,7,8-HxCDF
1,2,3,6,7,8-HxCDF
2,3,4,6,7,8-HxCDF
1,2,3,7,8,9-HxCDF

Therefore confirmation via SP-2331 was not performed.

OTHER QC DATA OUT OF SPECIFICATION

None.

SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall the laboratory data generated met the project goals and quality control criteria.

Data Validation Qualifiers

Qualifier	Description
J	Estimated value (bias undetermined) – The analyte was positively identified; but the associated numerical value is the approximate concentration of the analyte in the sample.
JH	Estimated value (potential high bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential high bias, of the analyte in the sample.
JL	Estimated value (potential low bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential low bias, of the analyte in the sample.
U	Non-detected value - The result initially reported as positive by the laboratory was qualified as not detected per USEPA Region II validation guidance, due to an associated quality control failure.
UJ	Estimated non-detect - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJL	Estimated non-detect (potential low bias) – The analyte was not detected and the report sample quantitation limit is biased low.
UJH	Estimated non-detect (potential high bias) – The analyte was not detected and the reported sample quantitation limit is biased high.
NJ	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
NJH	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration with a potential high bias, of the analyte concentration.
EMPC	Estimated Maximum Possible Concentration (EMPC).
R	The sample results are rejected. Due to a significant QA/QC problem, the analysis is invalid and provides no information as to whether the analyte is present or not.

Laboratory Qualifiers

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
EMPC	Estimated Maximum Possible Concentration (EMPC).
G	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the MDL or estimated detection limit (EDL), where appropriate.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

This Page Intentionally Left Blank

DATA VALIDATION REPORT FOR DIOXINS AND FURANS

SITE: Lower Passaic River Area, Focused Sediment Investigation Work Plan (FSIWP)

LABORATORY: Vista Analytical

SAMPLE DELIVERY GROUP: FSI001

This sample delivery group consists of the following samples:

RB-20120108	RB-20120109-CL	RB-20120109

The samples described above were analyzed via USEPA method 1613B to determine the concentrations of 2,3,7,8-substituted polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzo furans (PCDD/PCDFs) in water. This analytical procedure (indexed as standard operating procedure L-2) is located in Appendix B of the Focused Sediment Investigation Work Plan, Quality Assurance Project Plan, Lower Passaic River Study Area (FSIWP-QAPP).

Data validation SOP V-2 of the FSIWP-QAPP titled; USEPA Region II Data Validation SOP For EPA Method 1613, Revision B Tetra through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS), SOP HW-25, Rev. 3, September, 2006 was used to perform the dioxin and furan data validation.

All data qualification related to this group of samples is detailed on the attached sheets. Laboratory and data validation qualifiers and their related meanings are provided in the table located at the end of this report.

Major Data Quality Issues

None.

Minor Data Quality Issues

Sample Preservation and Handling – All samples in this delivery group were received by the laboratory with internal cooler temperatures in excess of 10 degrees Celsius. Therefore all positive sample results are flagged "J" estimated and all non-detects have been qualified "UJ", estimated non-detect.

Interferences – Several polychlorinated dibenzo furan results in the delivery group have been qualified as an estimated maximum possible concentration (EMPC), due to the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise.

Analyte Identification Criteria – Two samples exhibited responses for 2,3,7,8-TCDD that did not meet all specified identification criteria though they have been reported as positive by the laboratory. Affected results have been qualified as "J", estimated.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable due to significant QC problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort.

Lastly, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Date: 5/18/12

Diane Waldschmidt
Environmental Scientist/Director

HOLDING TIME/SAMPLE HANDLING

All samples in this delivery group were received at 19.4 degrees Celsius. Per validation guidance all positive sample results are flagged "J" estimated and all non-detects have been qualified "UJ", estimated non-detect.

All samples in this delivery group were prepared and analyzed within the holding time specified in the validation guideline.

CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

INITIAL CALIBRATION

Data was submitted representing six concentration level initial calibrations. All initial calibrations used during the analysis of samples in this delivery group were contained in the data package.

The validator has evaluated the initial calibrations examining ion ratios, signal to noise ratios, relative retention time and percent relative standard deviation criteria for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the initial calibration data all of the criteria listed in method 1613B were met.

ROUTINE CALIBRATION

A routine calibration standard was evaluated at the beginning of each 12-hour analysis period.

The validator has evaluated the routine calibration standard data submitted examining ion ratios, relative retention time, signal to noise ratios, and concentration reported for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the routine calibration data submitted, all of the criteria listed in method 1613B were met.

SAMPLE DATA

Qualitative Requirements

All positively reported results met method and validation qualitative acceptance criteria with the following exceptions. Samples RB-20120108 and RB-20120109 exhibited responses for native 2,3,7,8-TCDD and the labeled analog (^{13}C-2,3,7,8-TCDD) that do not meet the established method and validation acceptance criteria of having peaks maximizing within +/- 2 seconds of one another. 2,3,7,8-TCDD results reported for the affected samples have been qualified "J", estimated.

Quantitative Requirements

Sample and internal standard concentration calculations were verified and no errors were detected.

Interferences

Positive PCDF values reported for the samples in this delivery group were evaluated to determine the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise. Upon evaluation, the chromatograms for the following samples exhibited the presence of diphenyl ether (at greater than 2.5 times background) within the retention time range of the polychlorinated dibenzofurans listed below. Per validation guidance, the positive results reported for the analyte in the samples listed have been qualified as EMPC.

1,2,3,7,8-PeCDF
RB20120109

2,3,4,7,8-PeCDF
RB20120108
RB20120109

1,2,3,6,7,8-HxCDF
RB20120109

1,2,3,4,6,7,8-HpCDF
RB20120108
RB20120109

BLANKS

Rinsate Blanks

The three samples contained in this sample delivery group (SDG) were rinsate blanks. Upon evaluation of the results reported for the rinse blank, all target PCDD/PCDFs were found to be not detected with the following exceptions:

Analyte	Units	RB-20120108	RB-20120109-CL	RB-20120109
2,3,7,8-TCDD	pg/l	1100	47.9 G	984
1,2,3,7,8-PeCDD	pg/l	--	--	--
1,2,3,4,7,8-HxCDD	pg/l	--	--	--
1,2,3,6,7,8-HxCDD	pg/l	--	--	--
1,2,3,7,8,9-HxCDD	pg/l	--	--	--
1,2,3,4,6,7,8-HpCDD	pg/l	92.0 G	--	--
OCDD	pg/l	1100	164 G	24100
2,3,7,8-TCDF	pg/l	--	--	24.3 G
1,2,3,7,8-PeCDF	pg/l	--	--	78.3 G
2,3,4,7,8-PeCDF	pg/l	92.6 G	--	166 G
1,2,3,4,7,8-HxCDF	pg/l	945	32.7 G	1610
1,2,3,6,7,8-HxCDF	pg/l	535	23.8 G	204 G
2,3,4,6,7,8-HxCDF	pg/l	65.2 G	--	100 G
1,2,3,7,8,9-HxCDF	pg/l	--	--	46.7 G
1,2,3,4,6,7,8-HpCDF	pg/l	5330	175 G	8990
1,2,3,4,7,8,9-HpCDF	pg/l	--	--	370
OCDF	pg/l	8380	363 G	74000

pg/l = picograms per liter

Method Blanks

Method blanks were prepared and analyzed in association with the samples in this delivery group at the specified frequency. Upon examination of method blank data no analyte was positively identified at a concentration above or below the method defined minimum levels in any associated method blank.

FIELD DUPLICATE

This sample delivery group contains only rinsate blanks. Therefore a field duplicate is not required.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

This sample delivery group contains only rinsate blanks. Therefore a matrix spike/matrix spike duplicate are not required.

INTERNAL STANDARD

Internal standards ($^{13}C_{12}$-1,2,3,4-TCDD, $^{13}C_{12}$-1,2,3,4-TCDF and $^{13}C_{12}$-1,2,3,7,8,9-HxCDF) are added to each sample and method blank extract prior to injection. The area counts for each of the recovery standards in each sample must fall within the range (+100% to –50%) percent of that observed during the analysis of the mid-level daily calibration check standard. Upon evaluation all internal standard responses were within acceptable limits.

Upon evaluation all internal standard responses were within acceptable limits.

LABELED ANALOG STANDARDS

Calculated percent recoveries of labeled analog standards were within method and validation acceptance limits without exception.

OPR

Ongoing Precision and Recovery (OPR) standards were prepared and analyzed in association with the samples in this delivery group. All observed percent recoveries were within method 1613B allowable limits during the OPR determination.

IPR

Initial Precision and Recovery (IPR) standards were prepared and analyzed successfully by the laboratory. All observed average concentration and standard deviation values passed method defined acceptance criteria.

CLEAN-UP RECOVERY STANDARD

The clean-up recovery standard (^{37}Cl -2,3,7,8-TCDD) was successfully recovered from the samples in the delivery group.

SECOND COLUMN CONFIRMATION

Positive sample results (above the method defined minimum level) for the following analytes in the delivery group were confirmed via Sp-2331 column analyses:

2,3,7,8-TCDF
1,2,3,7,8-PeCDF
2,3,4,7,8-PeCDF
1,2,3,4,7,8-HxCDF
1,2,3,6,7,8-HxCDF
2,3,4,6,7,8-HxCDF
1,2,3,7,8,9-HxCDF

The validator has reported positive results for the compounds listed above from data obtained on the Sp-2331 analytical column in most cases. However, confirmation of positive results identified for these congeners during the primary analysis (DB-5) serves to further isolate the target analyte from co-eluting species and thereby limits the potential for high bias in reporting. Therefore, each of the two positive results identified (DB-5 and Sp-2331) have been compared and the lower value is reported. Also, each set of quality control (QC) has been evaluated independently. When a QC failure is identified on a particular column, sample results are reported from the column which is fully compliant regardless of the relative concentration values obtained.

OTHER QC DATA OUT OF SPECIFICATION

None.

SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall the laboratory data generated met the project goals and quality control criteria.

Data Validation Qualifiers

Qualifier	Description
J	Estimated value (bias undetermined) – The analyte was positively identified; but the associated numerical value is the approximate concentration of the analyte in the sample.
JH	Estimated value (potential high bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential high bias, of the analyte in the sample.
JL	Estimated value (potential low bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential low bias, of the analyte in the sample.
U	Non-detected value - The result initially reported as positive by the laboratory was qualified as not detected per USEPA Region II validation guidance, due to an associated quality control failure.
UJ	Estimated non-detect - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJL	Estimated non-detect (potential low bias) – The analyte was not detected and the report sample quantitation limit is biased low.
UJH	Estimated non-detect (potential high bias) – The analyte was not detected and the reported sample quantitation limit is biased high.
NJ	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
NJH	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration with a potential high bias, of the analyte concentration.
EMPC	Estimated Maximum Possible Concentration (EMPC).
R	The sample results are rejected. Due to a significant QA/QC problem, the analysis is invalid and provides no information as to whether the analyte is present or not.

Laboratory Qualifiers

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
EMPC	Estimated Maximum Possible Concentration (EMPC).
G	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the MDL or estimated detection limit (EDL), where appropriate.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

This Page Intentionally Left Blank

DATA VALIDATION REPORT FOR DIOXIN AND FURANS

SITE: Lower Passaic River Area, Focused Sediment Investigation Work Plan (FSIWP)

LABORATORY: Vista Analytical

SAMPLE DELIVERY GROUP: FSI002

This sample delivery group consists of the following samples:

B01-SD1-000-006	B02-SD1-000-006	B02-SD1-048-054	A01-SD1-012-018	SD-00-A01-030
B01-SD1-012-018	B02-SD1-012-018	B02-SD1-060-066	A01-SD1-018-024	A01-SD1-036-042
B01-SD1-024-030	B02-SD1-024-030	A01-SD1-000-006	A01-SD1-024-030	A01-SD1-042-048
B01-SD1-036-042	B02-SD1-036-042	A01-SD1-006-012	A01-SD1-030-036	

The samples described above were analyzed via USEPA method 1613B to determine the concentrations of 2,3,7,8-substituted polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzo furans (PCDD/PCDFs) in sediment. This analytical procedure (indexed as standard operating procedure L-2) is located in Appendix B of the Focused Sediment Investigation Work Plan, Quality Assurance Project Plan, Lower Passaic River Study Area (FSIWP-QAPP).

Data validation SOP V-2 of the FSIWP-QAPP titled; USEPA Region II Data Validation SOP For EPA Method 1613, Revision B Tetra through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS), SOP HW-25, Rev. 3, September, 2006 was used to perform the dioxin and furan data validation.

All data qualification related to this group of samples is detailed on the attached sheets. Laboratory and data validation qualifiers and their related meanings are provided in the table located at the end of this report.

Major Data Quality Issues

None.

Minor Data Quality Issues

Interferences – Several polychlorinated dibenzo furan results in the delivery group have been qualified as an estimated maximum possible concentration (EMPC), due to the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise.

Moisture Content – Eight sediment samples in this delivery group were found to contain greater than fifty but less than ninety percent moisture. All affected samples have PCDD/PCDF results qualified as “M” due to excessive moisture, when no other data qualifier was applied.

Rinse Blank Contamination – Several sample results required qualification as EMPC, estimated maximum possible concentration due to associated rinse blank contamination.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable due to significant QC problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort.

Lastly, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Date: 5/18/12

Diane Waldschmidt
Environmental Scientist/Director

HOLDING TIME/SAMPLE HANDLING

All samples in this delivery group were prepared and analyzed within the holding time specified in the validation guideline.

CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

INITIAL CALIBRATION

Data was submitted representing six concentration level initial calibrations. All initial calibrations used during the analysis of samples in this delivery group were contained in the data package.

The validator has evaluated the initial calibrations examining ion ratios, signal to noise ratios, retention time and percent relative standard deviation criteria for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the initial calibration data all of the criteria listed in method 1613B were met.

ROUTINE CALIBRATION

A routine calibration standard was evaluated at the beginning of each 12-hour analysis period.

The validator has evaluated the routine calibration standard data submitted examining ion ratios, retention time, signal to noise ratios, and concentration reported for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the routine calibration data submitted, all of the criteria listed in method 1613B were met.

SAMPLE DATA

Qualitative Requirements

All positive results reported, met method and validation qualitative acceptance criteria.

Quantitative Requirements

Sample and internal standard concentration calculations were verified and no errors were detected.

Interferences

Positive PCDF values reported for the samples in this delivery group were evaluated to determine the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise. Upon evaluation, the chromatograms for the following samples exhibited the presence of a diphenyl ether (at greater than 2.5 times background) within the retention time range of the polychlorinated dibenzo furans listed below. Per validation guidance, the positive results reported for the analyte in the samples listed have been qualified as EMPC.

1,2,3,6,7,8-HxCDF

B01-SD1-036-042
A01-SD1-000-006

1,2,3,4,6,7,8-HpCDF

B01-SD1-000-006
A01-SD1-036-042

MOISTURE CONTENT

Nine samples in this delivery group had observed percent moisture values that were between 50 and 90 percent and are listed below. The affected samples with PCDD/PCDF results not previously qualified due to failed QC criteria have results flagged “M” for excessive moisture.

A01-SD1-000-006	A01-SD1-018-024	A01-SD1-036-042
A01-SD1-006-012	A01-SD1-024-030	A01-SD1-042-048
A01-SD1-012-018	A01-SD1-030-036	SD-00-A01-030

BLANKS

Rinsate Blanks

Three rinsate blanks (RB-20120108, RB-20120109-CL and RB-20120109) were collected and analyzed in association with the samples in this delivery group. Results reported for each rinse blank are provided below. Note, data validation qualification of sample results are based on the maximum contaminant concentration detected in all associated blanks.

Analyte	Units	RB-20120108	RB-20120109-CL	RB-20120109
2,3,7,8-TCDD	pg/l	1100	47.9 G	984
1,2,3,7,8-PeCDD	pg/l	--	--	--
1,2,3,4,7,8-HxCDD	pg/l	--	--	--
1,2,3,6,7,8-HxCDD	pg/l	--	--	--
1,2,3,7,8,9-HxCDD	pg/l	--	--	--
1,2,3,4,6,7,8-HpCDD	pg/l	92.0 G	--	--
OCDD	pg/l	1100	164 G	24100
2,3,7,8-TCDF	pg/l	--	--	24.3 G
1,2,3,7,8-PeCDF	pg/l	--	--	78.3 G
2,3,4,7,8-PeCDF	pg/l	92.6 G	--	166 G
1,2,3,4,7,8-HxCDF	pg/l	945	32.7 G	1610
1,2,3,6,7,8-HxCDF	pg/l	535	23.8 G	204 G
2,3,4,6,7,8-HxCDF	pg/l	65.2 G	--	100 G
1,2,3,7,8,9-HxCDF	pg/l	--	--	46.7 G
1,2,3,4,6,7,8-HpCDF	pg/l	5330	175 G	8990
1,2,3,4,7,8,9-HpCDF	pg/l	--	--	370
OCDF	pg/l	8380	363 G	74000

pg/l = picograms per liter

The following samples are associated with rinse blanks RB-20120109-CL and RB-20120108:

B01-SD1-000-006	B01-SD1-024-030	B02-SD1-000-006	B02-SD1-024-030	B02-SD1-048-054
B01-SD1-012-018	B01-SD1-036-042	B02-SD1-012-018	B02-SD1-036-042	B02-SD1-060-066

Upon evaluation of positive results reported for the samples listed above, the following samples exhibited result concentrations less than five times that of the associated rinse blanks for the analytes indicated. Therefore based upon professional judgement, each of the affected sample results has been qualified EMPC at the reported concentration.

Analyte	B01-SD1-000-006	B01-SD1-012-018	B02-SD1-000-006	B02-SD1-012-018	B02-SD1-024-030	B02-SD1-036-042	B02-SD1-048-054	B02-SD1-060-066
2,3,7,8-TCDD	x	--	x	x	--	--	x	--
2,3,4,7,8-PeCDF	x	--	x	x	--	--	--	x
1,2,3,4,7,8-HxCDF	x	--	x	x	x	x	--	x
1,2,3,6,7,8-HxCDF	x	x	x	x	x	x	--	x
2,3,4,6,7,8-HxCDF	x	--	x	x	--	--	--	--
1,2,3,4,6,7,8-HpCDF	x	--	x	x	x	x	--	x
OCDF	x	--	x	x	--	x	--	x

The following samples are associated with rinse blanks RB-20120109-CL and RB-20120109:

A01-SD1-000-006	A01-SD1-018-024	SD-00-A01-030
A01-SD1-006-012	A01-SD1-024-030	A01-SD1-036-042
A01-SD1-012-018	A01-SD1-030-036	A01-SD1-042-048

Upon evaluation of positive results reported for the samples listed above, in no case were sample result concentrations less than five times that of the contaminants identified in the associated rinse blanks. Therefore, no qualification of sediment sample results is necessary.

Method Blanks

Method blanks were prepared and analyzed in association with the samples in this delivery group at the specified frequency. Upon examination of method blank data no analyte was positively identified at a concentration above or below the method defined minimum levels in any associated method blank.

FIELD DUPLICATE

Samples A01-SD1-030-036 and SD-00-A01-030 comprise the field duplicate pair. Field precision was adequately demonstrated since the relative percent difference between positive results obtained for the pair was less than 50% when results are greater than five times the project quantitation limit (PQL) and results reported for the pair differ by less than two times the PQL when results are less than five times the PQL.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Sample B01-SD1-036-042 was analyzed as a matrix spike/matrix spike (MS/MSD) duplicate pair. Upon evaluation all precision and accuracy indicators were favorable.

INTERNAL STANDARD

Internal standards ($^{13}C_{12}$-1,2,3,4-TCDD, $^{13}C_{12}$-1,2,3,4-TCDF and $^{13}C_{12}$-1,2,3,4,6,9-HxCDF) are added to each sample and method blank extract prior to injection. The area counts for each of the recovery standards in each sample must fall within the range (+100% to –50%) percent of that observed during the analysis of the mid-level daily calibration check standard.

Upon evaluation all internal standard responses were within acceptable limits.

LABELED ANALOG STANDARDS

Calculated percent recoveries of labeled analog standards were within method and validation acceptance limits without exception.

OPR

Ongoing Precision and Recovery (OPR) standards were prepared and analyzed in association with the samples in this delivery group. All observed percent recoveries were within method 1613B allowable limits during the OPR determination.

IPR

Initial Precision and Recovery (IPR) standards were prepared and analyzed successfully by the laboratory. All observed average concentration and standard deviation values passed method defined acceptance criteria.

CLEAN-UP RECOVERY STANDARD

The clean-up recovery standard (^{37}Cl 2,3,7,8-TCDD) was successfully recovered from the sediment samples in the delivery group.

SECOND COLUMN CONFIRMATION

Positive sample results (above the method defined minimum level) for the following analytes in the delivery group were confirmed via Sp-2331 column analyses:

2,3,7,8-TCDF
1,2,3,7,8-PeCDF
2,3,4,7,8-PeCDF
1,2,3,4,7,8-HxCDF
1,2,3,6,7,8-HxCDF
2,3,4,6,7,8-HxCDF
1,2,3,7,8,9-HxCDF

The validator has reported positive results for the compounds listed above from data obtained on the Sp-2331 analytical column in most cases. However, confirmation of positive results identified for these congeners during the primary analysis (DB-5) serves to further isolate the target analyte from co-eluting species and thereby limits the potential for high bias in reporting. Therefore, each of the two positive results identified (DB-5 and Sp-2331) have been compared and the lower value is reported. Also, each set of quality control (QC) has been evaluated independently. When a QC failure is identified on a particular column, sample results are reported from the column which is fully compliant regardless of the relative concentration values obtained.

OTHER QC DATA OUT OF SPECIFICATION

None.

SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall the laboratory data generated met the project goals and quality control criteria.

Data Validation Qualifiers

Qualifier	Description
J	Estimated value (bias undetermined) – The analyte was positively identified; but the associated numerical value is the approximate concentration of the analyte in the sample.
JH	Estimated value (potential high bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential high bias, of the analyte in the sample.
JL	Estimated value (potential low bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential low bias, of the analyte in the sample.
U	Non-detected value - The result initially reported as positive by the laboratory was qualified as not detected per USEPA Region II validation guidance, due to an associated quality control failure.
UJ	Estimated non-detect - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJL	Estimated non-detect (potential low bias) – The analyte was not detected and the report sample quantitation limit is biased low.
UJH	Estimated non-detect (potential high bias) – The analyte was not detected and the reported sample quantitation limit is biased high.
NJ	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
NJH	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration with a potential high bias, of the analyte concentration.
EMPC	Estimated Maximum Possible Concentration (EMPC).
R	The sample results are rejected. Due to a significant QA/QC problem, the analysis is invalid and provides no information as to whether the analyte is present or not.

Laboratory Qualifiers

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
EMPC	Estimated Maximum Possible Concentration (EMPC).
G	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the MDL or estimated detection limit (EDL), where appropriate.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

This Page Intentionally Left Blank

DATA VALIDATION REPORT FOR DIOXIN AND FURANS

SITE: Lower Passaic River Area, Focused Sediment Investigation Work Plan (FSIWP)

LABORATORY: Vista Analytical

SAMPLE DELIVERY GROUP: FSI003

This sample delivery group consists of the following samples:

B01-SD1-006-012	B01-SD1-042-048	B02-SD1-030-036	B02-SD1-054-060
B01-SD1-018-024	B02-SD1-006-012	SD-00-B02-030	B02-SD1-066-072
B01-SD1-030-036	B02-SD1-018-024	B02-SD1-042-048	

The samples described above were analyzed via USEPA method 1613B to determine the concentrations of 2,3,7,8-substituted polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzo furans (PCDD/PCDFs) in sediment. This analytical procedure (indexed as standard operating procedure L-2) is located in Appendix B of the Focused Sediment Investigation Work Plan, Quality Assurance Project Plan, Lower Passaic River Study Area (FSIWP-QAPP).

Data validation SOP V-2 of the FSIWP-QAPP titled; USEPA Region II Data Validation SOP For EPA Method 1613, Revision B Tetra through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS), SOP HW-25, Rev. 3, September, 2006 was used to perform the dioxin and furan data validation.

All data qualification related to this group of samples is detailed on the attached sheets. Laboratory and data validation qualifiers and their related meanings are provided in the table located at the end of this report.

Major Data Quality Issues

None.

Minor Data Quality Issues

Interferences – Several polychlorinated dibenzo furan results in the delivery group have been qualified as an estimated maximum possible concentration (EMPC), due to the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise.

Moisture Content – One sediment sample in this delivery group was found to contain greater than fifty but less than ninety percent moisture. The affected sample has PCDD/PCDF results qualified as “M” due to excessive moisture, when no other data qualifier was applied.

Rinse Blank Contamination – Several sample results required qualification as EMPC, estimated maximum possible concentration due to associated rinse blank contamination.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Unacceptable recovery for 1,2,3,4,6,7,8-HpCDD was exhibited during the MS/MSD evaluations. The 1,2,3,4,6,7,8-HpCDD recovery was below the lowest acceptance limit in both the matrix spike and the matrix spike duplicate. The affected analyte result in the unspiked sample has been qualified as "JL" estimated potential low bias.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable due to significant QC problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort.

Lastly, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Date: 5/18/12

Diane Waldschmidt
Environmental Scientist/Director

HOLDING TIME/SAMPLE HANDLING

All samples in this delivery group were prepared and analyzed within the holding time specified in the validation guideline.

CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

INITIAL CALIBRATION

Data was submitted representing six concentration level initial calibrations. All initial calibrations used during the analysis of samples in this delivery group were contained in the data package.

The validator has evaluated the initial calibrations examining ion ratios, signal to noise ratios, retention time and percent relative standard deviation criteria for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the initial calibration data all of the criteria listed in method 1613B were met.

ROUTINE CALIBRATION

A routine calibration standard was evaluated at the beginning of each 12-hour analysis period.

The validator has evaluated the routine calibration standard data submitted examining ion ratios, retention time, signal to noise ratios, and concentration reported for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the routine calibration data submitted, all of the criteria listed in method 1613B were met.

SAMPLE DATA

Qualitative Requirements

All positively reported results met method and validation qualitative acceptance criteria.

Quantitative Requirements

Sample and internal standard concentration calculations were verified and no errors were detected.

Interferences

Positive PCDF values reported for the samples in this delivery group were evaluated to determine the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise. Upon evaluation, the chromatograms for the following samples exhibited the presence of a diphenyl ether (at greater than 2.5 times background) within the retention time range of the polychlorinated dibenzo furans listed below. Per validation guidance, the positive results reported for the analyte in the samples listed have been qualified as EMPC.

1,2,3,6,7,8-HxCDF

B01-SD1-030-036
B01-SD1-042-048
B02-SD1-030-036
SD-00-B02-030

1,2,3,4,6,7,8-HpCDF

B01-SD1-030-036
A02-SD1-054-060

MOISTURE CONTENT

Sample B01-SD1-B01-042 had an observed percent moisture value that was between 50 and 90 percent. The affected sample PCDD/PCDF results not previously qualified due to failed QC criteria have been flagged “M” for excessive moisture.

BLANKS

Rinsate Blanks

Two rinsate blanks (RB-20120109-CL and RB-20120108) were collected and analyzed in association with the samples in this delivery group.

Analyte	Units	RB-20120109-CL	RB-20120108
2,3,7,8-TCDD	pg/l	47.9 G	1100
1,2,3,7,8-PeCDD	pg/l	--	--
1,2,3,4,7,8-HxCDD	pg/l	--	--
1,2,3,6,7,8-HxCDD	pg/l	--	--
1,2,3,7,8,9-HxCDD	pg/l	--	--
1,2,3,4,6,7,8-HpCDD	pg/l	--	92.0 G
OCDD	pg/l	164 G	1100
2,3,7,8-TCDF	pg/l	--	--
1,2,3,7,8-PeCDF	pg/l	--	--
2,3,4,7,8-PeCDF	pg/l	--	92.6 G
1,2,3,4,7,8-HxCDF	pg/l	32.7 G	945
1,2,3,6,7,8-HxCDF	pg/l	23.8 G	535
2,3,4,6,7,8-HxCDF	pg/l	--	65.2 G
1,2,3,7,8,9-HxCDF	pg/l	--	--
1,2,3,4,6,7,8-HpCDF	pg/l	175 G	5330
1,2,3,4,7,8,9-HpCDF	pg/l	--	--
OCDF	pg/l	363 G	8380

pg/l = picograms per liter

Upon evaluation of positive results reported for the sediment samples in this delivery group the following samples exhibited result concentrations less than five times that of the associated rinse blanks for the analytes indicated. Therefore based upon professional judgement, each of the affected sample results has been qualified EMPC at the reported concentration.

Analyte	B01-SD1-006-012	B01-SD1-018-024	B02-SD1-006-012	B02-SD1-018-024	B02-SD1-042-048	B02-SD1-054-060	B02-SD1-066-072
2,3,7,8-TCDD	x	x	x		x	x	x
1,2,3,4,6,7,8-HpCDD							x
OCDD							x
2,3,4,7,8-PeCDF	x		x	x			x
1,2,3,4,7,8-HxCDF	x	x	x	x	x	x	x
1,2,3,6,7,8-HxCDF	x	x	x	x		x	x
2,3,4,6,7,8-HxCDF	x		x	x		x	x
1,2,3,4,6,7,8-HpCDF	x	x	x	x		x	x
OCDF	x	x	x	x	x	x	x

Method Blanks

Method blanks were prepared and analyzed in association with the samples in this delivery group at the specified frequency. Upon examination of method blank data no analyte was positively identified at a concentration above or below the method defined minimum levels in any associated method blank.

FIELD DUPLICATE

Samples B02-SD1-030-036 and SD-00-B02-030 comprise the field duplicate pair. Field precision was adequately demonstrated since the relative percent difference between positive results obtained for the pair was less than 50% when results are greater than five times the project quantitation limit (PQL) and results reported for the pair differ by less than two times the PQL when results are less than five times the PQL.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Sample B01-SD1-018-024 was analyzed as a matrix spike/matrix spike (MS/MSD) duplicate pair. Upon evaluation all precision and accuracy indicators were favorable with the following exceptions.

Both the matrix spike and matrix spike duplicate recovery for 1,2,3,4,6,7,8-HpCDD (0%, 0%) fell below the lowest acceptance limit (60-140%). Per validation guidance, the 1,2,3,4,6,7,8-HpCDD result in the un-spiked sample (B01-SD1-018-024) has been qualified “JL” estimated potential low bias.

INTERNAL STANDARD

Internal standards ($^{13}C_{12}$-1,2,3,4-TCDD, $^{13}C_{12}$-1,2,3,4-TCDF and $^{13}C_{12}$-1,2,3,4,6,9-HxCDF) are added to each sample and method blank extract prior to injection. The area counts for each of the recovery standards in each sample must fall within the range (+100% to –50%) percent of that observed during the analysis of the mid-level daily calibration check standard.

Upon evaluation all internal standard responses were within acceptable limits.

LABELED ANALOG STANDARDS

Calculated percent recoveries of labeled analog standards were within method and validation acceptance limits without exception.

OPR

Ongoing Precision and Recovery (OPR) standards were prepared and analyzed in association with the samples in this delivery group. All observed percent recoveries were within method 1613B allowable limits during the OPR determination.

IPR

Initial Precision and Recovery (IPR) standards were prepared and analyzed successfully by the laboratory. All observed average concentration and standard deviation values passed method defined acceptance criteria.

CLEAN-UP RECOVERY STANDARD

The clean-up recovery standard (^{37}Cl 2,3,7,8-TCDD) was successfully recovered from the sediment samples in the delivery group.

SECOND COLUMN CONFIRMATION

Positive sample results (above the method defined minimum level) for the following analytes in the delivery group were confirmed via Sp-2331 column analyses:

2,3,7,8-TCDF
1,2,3,7,8-PeCDF
2,3,4,7,8-PeCDF
1,2,3,4,7,8-HxCDF
1,2,3,6,7,8-HxCDF
2,3,4,6,7,8-HxCDF
1,2,3,7,8,9-HxCDF

The validator has reported positive results for the compounds listed above from data obtained on the Sp-2331 analytical column in most cases. However, confirmation of positive results identified for these congeners during the primary analysis (DB-5) serves to further isolate the target analyte from co-eluting species and thereby limits the potential for high bias in reporting. Therefore, each of the two positive results identified (DB-5 and Sp-2331) have been compared and the lower value is reported. Also, each set of quality control (QC) has been evaluated independently. When a QC failure is identified on a particular column, sample results are reported from the column which is fully compliant regardless of the relative concentration values obtained.

OTHER QC DATA OUT OF SPECIFICATION

None.

SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall the laboratory data generated met the project goals and quality control criteria.

Data Validation Qualifiers

Qualifier	Description
J	Estimated value (bias undetermined) – The analyte was positively identified; but the associated numerical value is the approximate concentration of the analyte in the sample.
JH	Estimated value (potential high bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential high bias, of the analyte in the sample.
JL	Estimated value (potential low bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential low bias, of the analyte in the sample.
U	Non-detected value - The result initially reported as positive by the laboratory was qualified as not detected per USEPA Region II validation guidance, due to an associated quality control failure.
UJ	Estimated non-detect - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJL	Estimated non-detect (potential low bias) – The analyte was not detected and the report sample quantitation limit is biased low.
UJH	Estimated non-detect (potential high bias) – The analyte was not detected and the reported sample quantitation limit is biased high.
NJ	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
NJH	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration with a potential high bias, of the analyte concentration.
EMPC	Estimated Maximum Possible Concentration (EMPC).
R	The sample results are rejected. Due to a significant QA/QC problem, the analysis is invalid and provides no information as to whether the analyte is present or not.

Laboratory Qualifiers

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
EMPC	Estimated Maximum Possible Concentration (EMPC).
G	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the MDL or estimated detection limit (EDL), where appropriate.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

This Page Intentionally Left Blank

DATA VALIDATION REPORT FOR DIOXIN AND FURANS

SITE: Lower Passaic River Area, Focused Sediment Investigation Work Plan (FSIWP)

LABORATORY: Vista Analytical

SAMPLE DELIVERY GROUP: FSI004

This sample delivery group consists of the following samples:

A01-SD1-048-054	A01-SD1-072-078	A02-SD1-012-018	A02-SD1-036-042	SD-00-A02-054
A01-SD1-054-060	A01-SD1-078-084	A02-SD1-018-024	A02-SD1-042-048	A02-SD1-060-066
A01-SD1-060-066	A02-SD1-000-006	A02-SD1-024-030	A02-SD1-048-054	A02-SD1-066-072
A01-SD1-066-072	A02-SD1-006-012	A02-SD1-030-036	A02-SD1-054-060	

The samples described above were analyzed via USEPA method 1613B to determine the concentrations of 2,3,7,8-substituted polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzo furans (PCDD/PCDFs) in sediment. This analytical procedure (indexed as standard operating procedure L-2) is located in Appendix B of the Focused Sediment Investigation Work Plan, Quality Assurance Project Plan, Lower Passaic River Study Area (FSIWP-QAPP).

Data validation SOP V-2 of the FSIWP-QAPP titled; USEPA Region II Data Validation SOP For EPA Method 1613, Revision B Tetra through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS), SOP HW-25, Rev. 3, September, 2006 was used to perform the dioxin and furan data validation.

All data qualification related to this group of samples is detailed on the attached sheets. Laboratory and data validation qualifiers and their related meanings are provided in the table located at the end of this report.

Major Data Quality Issues

None.

Minor Data Quality Issues

Interferences – Several polychlorinated dibenzo furan results in the delivery group have been qualified as an estimated maximum possible concentration (EMPC), due to the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise.

Moisture Content – Three sediment samples in this delivery group were found to contain greater than fifty but less than ninety percent moisture. All affected samples have PCDD/PCDF results qualified as “M” due to excessive moisture, when no other data qualifier has been applied.

Rinse Blank Contamination – Several sample results required qualification as EMPC, estimated maximum possible concentration due to associated rinse blank contamination.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Precision observed for 2,3,7,8-TCDD during the MS/MSD evaluation did not meet established acceptance criteria. The 2,3,7,8-TCDD result reported for the un-spiked sample has been qualified “J”, estimated on this basis.

Linear Range Exceedance – One 2,3,7,8-TCDD result was reported based upon an instrument signal that fell above the instruments established linear range. The affected result has been qualified "J", estimated.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable due to significant QC problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort.

Lastly, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Date: 5/18/12

Diane Waldschmidt
Environmental Scientist/Director

HOLDING TIME/SAMPLE HANDLING

All samples in this delivery group were prepared and analyzed within the holding time specified in the validation guideline.

CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

INITIAL CALIBRATION

Data was submitted representing six concentration level initial calibrations. All initial calibrations used during the analysis of samples in this delivery group were contained in the data package.

The validator has evaluated the initial calibrations examining ion ratios, signal to noise ratios, retention time and percent relative standard deviation criteria for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the initial calibration data all of the criteria listed in method 1613B were met.

ROUTINE CALIBRATION

A routine calibration standard was evaluated at the beginning of each 12-hour analysis period.

The validator has evaluated the routine calibration standard data submitted examining ion ratios, retention time, signal to noise ratios, and concentration reported for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the routine calibration data submitted, all of the criteria listed in method 1613B were met.

SAMPLE DATA

Qualitative Requirements

All positive results reported, met method and validation qualitative acceptance criteria.

Quantitative Requirements

Sample and internal standard concentration calculations were verified and no errors were detected.

Interferences

Positive PCDF values reported for the samples in this delivery group were evaluated to determine the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise. Upon evaluation, the chromatograms for the following samples exhibited the presence of a diphenyl ether (at greater than 2.5 times background) within the retention time range of the polychlorinated dibenzo furans listed below. Per validation guidance, the positive results reported for the analyte in the samples listed have been qualified as EMPC.

1,2,3,6,7,8-HxCDF

A01-SD1-006-012
A01-SD1-054-060
A02-SD1-000-006

MOISTURE CONTENT

Three samples in this delivery group had observed percent moisture values that were between 50 and 90 percent and are listed below. The affected samples with PCDD/PCDF results not previously qualified due to failed QC criteria have results flagged “M” for excessive moisture.

A01-SD1-048-054	A01-SD1-054-060	A02-SD1-000-006

BLANKS

Rinsate Blanks

Two rinsate blanks (RB-20120109-CL and RB-20120109) were collected and analyzed in association with the samples in this delivery group. Results reported for each rinse blank are provided below. Note, data validation qualification of sample results are based on the maximum contaminant concentration detected in all associated blanks.

Analyte	Units	RB-20120109-CL	RB-20120109
2,3,7,8-TCDD	pg/l	47.9 G	984
1,2,3,7,8-PeCDD	pg/l	--	--
1,2,3,4,7,8-HxCDD	pg/l	--	--
1,2,3,6,7,8-HxCDD	pg/l	--	--
1,2,3,7,8,9-HxCDD	pg/l	--	--
1,2,3,4,6,7,8-HpCDD	pg/l	--	--
OCDD	pg/l	164 G	24100
2,3,7,8-TCDF	pg/l	--	24.3 G
1,2,3,7,8-PeCDF	pg/l	--	78.3 G
2,3,4,7,8-PeCDF	pg/l	--	166 G
1,2,3,4,7,8-HxCDF	pg/l	32.7 G	1610
1,2,3,6,7,8-HxCDF	pg/l	23.8 G	204 G
2,3,4,6,7,8-HxCDF	pg/l	--	100 G
1,2,3,7,8,9-HxCDF	pg/l	--	46.7 G
1,2,3,4,6,7,8-HpCDF	pg/l	175 G	8990
1,2,3,4,7,8,9-HpCDF	pg/l	--	370
OCDF	pg/l	363 G	74000

pg/l = picograms per liter

Upon evaluation of positive results reported for the sediment samples in this delivery group the following samples exhibited result concentrations less than five times that of the associated rinse blanks for the analytes indicated. Therefore based upon professional judgment, each of the affected sample results has been qualified EMPC at the reported concentration.

Analyte	A01-SD1-066-072	A01-SD1-072-078	A01-SD1-078-084	A02-SD1-012-018	A02-SD1-018-024	A01-SD1-024-030	A02-SD1-030-036	A02-SD1-036-042	A02-SD1-042-048	A02-SD1-048-054	A02-SD1-054-060	SD-00-A02-054	A02-SD1-060-066	A02-SD1-066-072
2,3,7,8-TCDD		x	x		x	x	x	x	x	x	x	x	x	
OCDD			x		x		x	x	x	x	x	x	x	x
2,378-TCDF								x						
1,2,3,7,8-PeCDF			x		x	x	x						x	
2,3,4,7,8-PeCDF			x	x	x	x		x	x	x				
1,2,3,4,7,8-HxCDF		x	x	x	x	x	x	x	x	x				
1,2,3,6,7,8-HxCDF			x	x	x	x	x	x	x	x				
2,3,4,6,7,8-HxCDF			x	x	x	x	x	x		x				
1,2,3,7,8,9-HxCDF			x		x	x		x						
1,2,3,4,6,7,8-HpCDF		x	x	x	x	x	x	x	x	x		x	x	x
1,2,3,4,7,8-HpCDF			x	x	x	x								
OCDF	x	X	x	x	x	x	x	x	x	x	x	x	x	x

Method Blanks

Method blanks were prepared and analyzed in association with the samples in this delivery group at the specified frequency. Upon examination of method blank data no analyte was positively identified at a concentration above or below the method defined minimum levels in any associated method blank.

FIELD DUPLICATE

Samples A02-SD1-054-060 and SD-00-A02-054 comprise the field duplicate pair. Field precision was adequately demonstrated since the relative percent difference between positive results obtained for the pair was less than 50% when results are greater than five times the project quantitation limit (PQL) and results reported for the pair differ by less than two times the PQL when results are less than five times the PQL.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Sample A01-SD1-066-072 was analyzed as a matrix spike and matrix spike (MS/MSD) duplicate pair. Upon evaluation all precision and accuracy indicators were favorable with the following exceptions. The observed matrix spike recovery for 2,3,4,7,8-PeCDF (142%) was higher than the highest acceptance limit (60-140%), while the matrix spike duplicate recovery fell within the acceptance window. Reproducibility for the pair (relative percent difference 12.7%) was acceptable. Therefore qualification of the 2,3,4,7,8-PeCDF sample result is not necessary. However, the observed relative percent difference between 2,3,7,8-TCDD results reported for the pair (53.4%) does not meet established acceptance criteria (+/- 50%) for precision. Therefore, per validation guidance, the 2,3,7,8-TCDD result in the un-spiked sample (A01-SD1-066-072) has been qualified “J” estimated.

INTERNAL STANDARD

Internal standards ($^{13}C_{12}$-1,2,3,4-TCDD, $^{13}C_{12}$-1,2,3,4-TCDF and $^{13}C_{12}$-1,2,3,4,6,9-HxCDF) are added to each sample and method blank extract prior to injection. The area counts for each of the recovery standards in each sample must fall within the range (+100% to –50%) percent of that observed during the analysis of the mid-level daily calibration check standard. Upon evaluation all internal standard responses were within acceptable limits.

LABELED ANALOG STANDARDS

Calculated percent recoveries of labeled analog standards were within method and validation acceptance limits without exception.

OPR

Ongoing Precision and Recovery (OPR) standards were prepared and analyzed in association with the samples in this delivery group. All observed percent recoveries were within method 1613B allowable limits during the OPR determination.

IPR

Initial Precision and Recovery (IPR) standards were prepared and analyzed successfully by the laboratory. All observed average concentration and standard deviation values passed method defined acceptance criteria.

CLEAN-UP RECOVERY STANDARD

The clean-up recovery standard (^{37}Cl 2,3,7,8-TCDD) was successfully recovered from the sediment samples in the delivery group.

SECOND COLUMN CONFIRMATION

Positive sample results (above the method defined minimum level) for the following analytes in the delivery group were confirmed via Sp-2331 column analyses:

2,3,7,8-TCDF
1,2,3,7,8-PeCDF
2,3,4,7,8-PeCDF
1,2,3,4,7,8-HxCDF
1,2,3,6,7,8-HxCDF
2,3,4,6,7,8-HxCDF
1,2,3,7,8,9-HxCDF

The validator has reported positive results for the compounds listed above from data obtained on the Sp-2331 analytical column in most cases. However, confirmation of positive results identified for these congeners during the primary analysis (DB-5) serves to further isolate the target analyte from co-eluting species and thereby limits the potential for high bias in reporting. Therefore, each of the two positive results identified (DB-5 and Sp-2331) have been compared and the lower value is reported. Also, each set of quality control (QC) has been evaluated independently. When a QC failure is identified on a particular column, sample results are reported from the column which is fully compliant regardless of the relative concentration values obtained.

OTHER QC DATA OUT OF SPECIFICATION

Linear Range Exceedance

The 2,3,7,8-TCDD result reported for sample A01-SD1-048-054 was reported based upon an instrument signal that was greater than the instruments demonstrated linear range. The 2,3,7,8-TCDD result for the affected sample has been qualified "J" estimated on this basis.

SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall the laboratory data generated met the project goals and quality control criteria.

Data Validation Qualifiers

Qualifier	Description
J	Estimated value (bias undetermined) – The analyte was positively identified; but the associated numerical value is the approximate concentration of the analyte in the sample.
JH	Estimated value (potential high bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential high bias, of the analyte in the sample.
JL	Estimated value (potential low bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential low bias, of the analyte in the sample.
U	Non-detected value - The result initially reported as positive by the laboratory was qualified as not detected per USEPA Region II validation guidance, due to an associated quality control failure.
UJ	Estimated non-detect - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJL	Estimated non-detect (potential low bias) – The analyte was not detected and the report sample quantitation limit is biased low.
UJH	Estimated non-detect (potential high bias) – The analyte was not detected and the reported sample quantitation limit is biased high.
NJ	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
NJH	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration with a potential high bias, of the analyte concentration.
EMPC	Estimated Maximum Possible Concentration (EMPC).
R	The sample results are rejected. Due to a significant QA/QC problem, the analysis is invalid and provides no information as to whether the analyte is present or not.

Laboratory Qualifiers

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
EMPC	Estimated Maximum Possible Concentration (EMPC).
G	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the MDL or estimated detection limit (EDL), where appropriate.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

This Page Intentionally Left Blank

DATA VALIDATION REPORT FOR DIOXIN AND FURANS

SITE: Lower Passaic River Area, Focused Sediment Investigation Work Plan (FSIWP)

LABORATORY: Vista Analytical

SAMPLE DELIVERY GROUP: FSI005

This sample delivery group consists of the following samples:

A03-SD1-000-006	A03-SD1-018-024	A03-SD1-030-036	A03-SD1-048-054	A03-SD1-066-072
A03-SD1-006-012	A03-SD1-024-030	A03-SD1-036-042	A03-SD1-054-060	A03-SD1-072-078
A03-SD1-012-018	SD-00-A03-024	A03-SD1-042-048	A03-SD1-060-066	A03-SD1-078-084

The samples described above were analyzed via USEPA method 1613B to determine the concentrations of 2,3,7,8-substituted polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzo furans (PCDD/PCDFs) in sediment. This analytical procedure (indexed as standard operating procedure L-2) is located in Appendix B of the Focused Sediment Investigation Work Plan, Quality Assurance Project Plan, Lower Passaic River Study Area (FSIWP-QAPP).

Data validation SOP V-2 of the FSIWP-QAPP titled; USEPA Region II Data Validation SOP For EPA Method 1613, Revision B Tetra through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS), SOP HW-25, Rev. 3, September, 2006 was used to perform the dioxin and furan data validation.

All data qualification related to this group of samples is detailed on the attached sheets. Laboratory and data validation qualifiers and their related meanings are provided in the table located at the end of this report.

Major Data Quality Issues

None.

Minor Data Quality Issues

Interferences – One polychlorinated dibenzo furan result in the delivery group has been qualified as an estimated maximum possible concentration (EMPC), due to the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise.

Moisture Content – Ten sediment samples in this delivery group were found to contain greater than fifty but less than ninety percent moisture. All affected samples have PCDD/PCDF results qualified as “M” due to excessive moisture, when no other data qualifier has been applied.

Rinse Blank Contamination – Several sample results required qualification as EMPC, estimated maximum possible concentration due to associated rinse blank contamination.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Unacceptable recovery for three analytes was exhibited during the MS/MSD evaluations. The affected analyte results in the unspiked sample have been qualified as as “JH” estimated potential high bias, or “JL” estimated potential low bias as appropriate.

Linear Range Exceedance – One 2,3,7,8-TCDD and 1,2,3,4,6,7,8-HpCDF result was reported based upon an instrument signal that fell above the instruments established linear range. The affected result has been qualified "J", estimated.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable due to significant QC problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort.

Lastly, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Date: 5/18/12

Diane Waldschmidt
Environmental Scientist/Director

HOLDING TIME/SAMPLE HANDLING

All samples in this delivery group were prepared and analyzed within the holding time specified in the validation guideline.

CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

INITIAL CALIBRATION

Data was submitted representing six concentration level initial calibrations. All initial calibrations used during the analysis of samples in this delivery group were contained in the data package.

The validator has evaluated the initial calibrations examining ion ratios, signal to noise ratios, retention time and percent relative standard deviation criteria for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the initial calibration data all of the criteria listed in method 1613B were met.

ROUTINE CALIBRATION

A routine calibration standard was evaluated at the beginning of each 12-hour analysis period.

The validator has evaluated the routine calibration standard data submitted examining ion ratios, retention time, signal to noise ratios, and concentration reported for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the routine calibration data submitted, all of the criteria listed in method 1613B were met.

SAMPLE DATA

Qualitative Requirements

All positive results reported, met method and validation qualitative acceptance criteria.

Quantitative Requirements

Sample and internal standard concentration calculations were verified and no errors were detected.

Interferences

Positive PCDF values reported for the samples in this delivery group were evaluated to determine the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise. Upon evaluation, the chromatograms for the following samples exhibited the presence of a diphenyl ether (at greater than 2.5 times background) within the retention time range of the polychlorinated dibenzo furans listed below. Per validation guidance, the positive result reported for the analyte in the sample listed has been qualified as EMPC.

1,2,3,6,7,8-HxCDF

A03-SD1-030-036

MOISTURE CONTENT

Ten samples in this delivery group had observed percent moisture values that were between 50 and 90 percent and are listed below. The affected samples with PCDD/PCDF results not previously qualified due to failed QC criteria have results flagged "M" for excessive moisture.

A03-SD1-000-006	A03-SD1-024-030	A03-SD1-036-042	A03-SD1-060-066
A03-SD1-012-018	A03-SD1-030-036	A03-SD1-042-048	
A03-SD1-018-024	SD-00-A03-024	A03-SD1-048-054	

BLANKS

Rinsate Blanks

Two rinsate blanks (RB-20120109-CL and RB-20120109) were collected and analyzed in association with the samples in this delivery group. Results reported for each rinse blank are provided below. Note, data validation qualification of sample results are based on the maximum contaminant concentration detected in all associated blanks.

Analyte	Units	RB-20120109-CL	RB-20120109
2,3,7,8-TCDD	pg/l	47.9 G	984
1,2,3,7,8-PeCDD	pg/l	--	--
1,2,3,4,7,8-HxCDD	pg/l	--	--
1,2,3,6,7,8-HxCDD	pg/l	--	--
1,2,3,7,8,9-HxCDD	pg/l	--	--
1,2,3,4,6,7,8-HpCDD	pg/l	--	--
OCDD	pg/l	164 G	24100
2,3,7,8-TCDF	pg/l	--	24.3 G
1,2,3,7,8-PeCDF	pg/l	--	78.3 G
2,3,4,7,8-PeCDF	pg/l	--	166 G
1,2,3,4,7,8-HxCDF	pg/l	32.7 G	1610
1,2,3,6,7,8-HxCDF	pg/l	23.8 G	204 G
2,3,4,6,7,8-HxCDF	pg/l	--	100 G
1,2,3,7,8,9-HxCDF	pg/l	--	46.7 G
1,2,3,4,6,7,8-HpCDF	pg/l	175 G	8990
1,2,3,4,7,8,9-HpCDF	pg/l	--	370
OCDF	pg/l	363 G	74000

pg/l = picograms per liter

Upon evaluation of positive results reported for the sediment samples in this delivery group the following samples exhibited result concentrations less than five times that of the associated rinse blanks for the analytes indicated. Therefore based upon professional judgement, each of the affected sample results has been qualified EMPC at the reported concentration.

Analyte	A03-SD1-006-012	A03-SD1-054-060	A03-SD1-072-078	A03-SD1-078-084
2,3,7,8-TCDD				x
OCDD				x
1,2,3,7,7-PeCDF				
2,3,4,7,8-PeCDF				
1,2,3,4,7,8-HxCDF				x
1,2,3,6,7,8-HxCDF				x
1,2,3,7,8,9-HxCDF				
1,2,3,4,6,7,8-HpCDF				x
1,2,3,4,7,8,9-HpCDF				
OCDF	x	x	x	x

Method Blanks

Method blanks were prepared and analyzed in association with the samples in this delivery group at the specified frequency. Upon examination of method blank data no analyte was positively identified at a concentration above or below the method defined minimum levels in any associated method blank.

FIELD DUPLICATE

Samples A03-SD1-024-030 and SD-00-A03-024 comprise the field duplicate pair. Field precision was adequately demonstrated since the relative percent difference between positive results obtained for the pair was less than 50% when results are greater than five times the project quantitation limit (PQL) and results reported for the pair differ by less than two times the PQL when results are less than five times the PQL.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Sample A03-SD1-060-066 was analyzed as a matrix spike/matrix spike (MS/MSD) duplicate pair. Upon evaluation all precision and accuracy indicators were favorable with the following exceptions. The observed matrix spike duplicate recoveries for 1,2,3,7,8- PeCDD (143%) and 2,3,7,8,-TCDF (178%) were higher than the highest acceptance limit (60-140%), while the matrix spike recoveries for these same analytes fell within the acceptance window. Reproducibility for each of the pairs was acceptable. The observed spike recoveries are inconclusive for the affected analytes therefore qualification of the associated sample results is not necessary.

Both MS and MSD evaluations for 2,3,4,7,8-PeCDF (172%/187%) and 2,3,4,6,7,8-HxCDF (142%/145%) were higher than the highest acceptance limit (60-140%). High bias is indicated therefore the 2,3,4,7,8-PeCDF and 2,3,4,6,7,8-HxCDF results for sample A03-SD1-060-066 have been qualified “JH”, estimated potential high bias.

Both MS and MSD evaluations for 1,2,3,7,8,9-HxCDF (13%/17%) were lower than the lowest acceptance limit (60-140%). Low bias is indicated therefore the1,2,3,7,8,9-HxCDF result for sample A03-SD1-060-066 has been qualified "JL", estimated potential low bias.

INTERNAL STANDARD

Internal standards ($^{13}C_{12}$-1,2,3,4-TCDD, $^{13}C_{12}$-1,2,3,4-TCDF and $^{13}C_{12}$-1,2,3,4,6,9-HxCDF) are added to each sample and method blank extract prior to injection. The area counts for each of the recovery standards in each sample must fall within the range (+100% to –50%) percent of that observed during the analysis of the mid-level daily calibration check standard.

Upon evaluation all internal standard responses were within acceptable limits.

LABELED ANALOG STANDARDS

Calculated percent recoveries of labeled analog standards were within method and validation acceptance limits without exception.

OPR

Ongoing Precision and Recovery (OPR) standards were prepared and analyzed in association with the samples in this delivery group. All observed percent recoveries were within method 1613B allowable limits during the OPR determination.

IPR

Initial Precision and Recovery (IPR) standards were prepared and analyzed successfully by the laboratory. All observed average concentration and standard deviation values passed method defined acceptance criteria.

CLEAN-UP RECOVERY STANDARD

The clean-up recovery standard (^{37}Cl 2,3,7,8-TCDD) was successfully recovered from the sediment samples in the delivery group.

SECOND COLUMN CONFIRMATION

Positive sample results (above the method defined minimum level) for the following analytes in the delivery group were confirmed via Sp-2331 column analyses:

2,3,7,8-TCDF
1,2,3,7,8-PeCDF
2,3,4,7,8-PeCDF
1,2,3,4,7,8-HxCDF
1,2,3,6,7,8-HxCDF
2,3,4,6,7,8-HxCDF
1,2,3,7,8,9-HxCDF

The validator has reported positive results for the compounds listed above from data obtained on the Sp-2331 analytical column in most cases. However, confirmation of positive results identified for these congeners during the primary analysis (DB-5) serves to further isolate the target analyte from co-eluting species and thereby limits the potential for high bias in reporting. Therefore, each of the two positive results identified (DB-5 and Sp-2331) have been compared and the lower value is reported. Also, each set of quality control (QC) has been evaluated independently. When a QC failure is identified on a particular column, sample results are reported from the column which is fully compliant regardless of the relative concentration values obtained.

OTHER QC DATA OUT OF SPECIFICATION

Linear Range Exceedance

The 2,3,7,8-TCDD result reported for sample A03-SD1-036-042 and the 1,2,3,4,6,7,8-HpCDF result reported for sample A03-SD1-060-066 were reported based upon an instrument signal that was greater than the instrument demonstrated linear range. The affected results have been qualified "J" estimated on this basis.

SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall the laboratory data generated met the project goals and quality control criteria.

Data Validation Qualifiers

Qualifier	Description
J	Estimated value (bias undetermined) – The analyte was positively identified; but the associated numerical value is the approximate concentration of the analyte in the sample.
JH	Estimated value (potential high bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential high bias, of the analyte in the sample.
JL	Estimated value (potential low bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential low bias, of the analyte in the sample.
U	Non-detected value - The result initially reported as positive by the laboratory was qualified as not detected per USEPA Region II validation guidance, due to an associated quality control failure.
UJ	Estimated non-detect - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJL	Estimated non-detect (potential low bias) – The analyte was not detected and the report sample quantitation limit is biased low.
UJH	Estimated non-detect (potential high bias) – The analyte was not detected and the reported sample quantitation limit is biased high.
NJ	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
NJH	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration with a potential high bias, of the analyte concentration.
EMPC	Estimated Maximum Possible Concentration (EMPC).
R	The sample results are rejected. Due to a significant QA/QC problem, the analysis is invalid and provides no information as to whether the analyte is present or not.

Laboratory Qualifiers

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
EMPC	Estimated Maximum Possible Concentration (EMPC).
G	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the MDL or estimated detection limit (EDL), where appropriate.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

This Page Intentionally Left Blank

DATA VALIDATION REPORT FOR DIOXIN AND FURANS

SITE: Lower Passaic River Area, Focused Sediment Investigation Work Plan (FSIWP)

LABORATORY: Vista Analytical

SAMPLE DELIVERY GROUP: FSI006

This sample delivery group consists of the following samples:

C01-SD1-000-006	C01-SD1-012-018	C01-SD1-024-030	C01-SD1-030-036
C01-SD1-006-012	C01-SD1-018-024	SD1-00-C01-024	RB-20120111

The samples described above were analyzed via USEPA method 1613B to determine the concentrations of 2,3,7,8-substituted polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzo furans (PCDD/PCDFs) in sediment. This analytical procedure (indexed as standard operating procedure L-2) is located in Appendix B of the Focused Sediment Investigation Work Plan, Quality Assurance Project Plan, Lower Passaic River Study Area (FSIWP-QAPP).

Data validation SOP V-2 of the FSIWP-QAPP titled; USEPA Region II Data Validation SOP For EPA Method 1613, Revision B Tetra through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS), SOP HW-25, Rev. 3, September, 2006 was used to perform the dioxin and furan data validation.

All data qualification related to this group of samples is detailed on the attached sheets. Laboratory and data validation qualifiers and their related meanings are provided in the table located at the end of this report.

Major Data Quality Issues

None.

Minor Data Quality Issues

Sample Preservation and Handling – One sample in this delivery group was received by the laboratory with an internal cooler temperature in excess of 10 degrees Celsius. Therefore the affected sample has positive sample results flagged “J” estimated.

Interferences – Several polychlorinated dibenzo furan results in the delivery group have been qualified as an estimated maximum possible concentration (EMPC), due to the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise.

Moisture Content – Seven sediment samples in this delivery group were found to contain greater than fifty but less than ninety percent moisture. All affected samples have PCDD/PCDF results qualified as “M” due to excessive moisture, when no other data qualifier has been applied.

Rinse Blank Contamination – Several sample results required qualification as EMPC, estimated maximum possible concentration due to associated rinse blank contamination.

Field Duplicate Precision – Observed field duplicate precision exhibited for 2,3,7,8-TCDD during the field duplicate evaluation associated with this sample delivery group did not meet established acceptance criteria. Both samples comprising the field duplicate pair have 2,3,7,8-TCDD results qualified as estimated, “J” on this basis.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable due to significant QC problems, the data is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on any data tables even as a last resort.

Lastly, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Date: 5/18/12

Diane Waldschmidt
Environmental Scientist/Director

HOLDING TIME/SAMPLE HANDLING

Sample RB-20120111 was received by the laboratory at 19.4 degrees Celsius. Per validation guidance positive results reported for the affected sample are flagged "J" estimated.

All samples in this delivery group were prepared and analyzed within the holding time specified in the validation guideline.

CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

INITIAL CALIBRATION

Data was submitted representing six concentration level initial calibrations. All initial calibrations used during the analysis of samples in this delivery group were contained in the data package.

The validator has evaluated the initial calibrations examining ion ratios, signal to noise ratios, retention time and percent relative standard deviation criteria for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the initial calibration data all of the criteria listed in method 1613B were met.

ROUTINE CALIBRATION

A routine calibration standard was evaluated at the beginning of each 12-hour analysis period.

The validator has evaluated the routine calibration standard data submitted examining ion ratios, retention time, signal to noise ratios, and concentration reported for all PCDD/PCDFs target analytes and their labeled analogs.

Upon examination of the routine calibration data submitted, all of the criteria listed in method 1613B were met.

SAMPLE DATA

Qualitative Requirements

All positive results reported, met method and validation qualitative acceptance criteria.

Quantitative Requirements

Sample and internal standard concentration calculations were verified and no errors were detected.

Interferences

Positive PCDF values reported for the samples in this delivery group were evaluated to determine the presence of the corresponding diphenyl ether at a peak signal greater than 2.5 times that of the background noise. Upon evaluation, the chromatograms for the following samples exhibited the presence of a diphenyl ether (at greater than 2.5 times background) within the retention time range of the polychlorinated dibenzo furans listed below. Per validation guidance, the positive results reported for the analyte in the samples listed have been qualified as EMPC.

1,2,3,6,7,8-HxCDF

C01-SD1-006-012
RB-20120111

MOISTURE CONTENT

All seven samples in this delivery group had observed percent moisture values that were between 50 and 90 percent and are listed below. The affected samples with PCDD/PCDF results not previously qualified due to failed QC criteria have results flagged “M” for excessive moisture.

C01-SD1-000-006	C01-SD1-012-018	C01-SD1-024-030	C01-SD1-030-036
C01-SD1-006-012	C01-SD1-018-024	SD1-00-C01-024	

BLANKS

Rinsate Blanks

Two rinsate blanks (RB-20120109-CL and RB-20120111) were collected and analyzed in association with the samples in this delivery group. Results reported for each rinse blank are provided below. Note, data validation qualification of sample results are based on the maximum contaminant concentration detected in all associated blanks.

Analyte	Units	RB-20120109-CL	RB-20120111
2,3,7,8-TCDD	pg/l	47.9 G	305000
1,2,3,7,8-PeCDD	pg/l	--	1810
1,2,3,4,7,8-HxCDD	pg/l	--	928
1,2,3,6,7,8-HxCDD	pg/l	--	1920
1,2,3,7,8,9-HxCDD	pg/l	--	685
1,2,3,4,6,7,8-HpCDD	pg/l	--	5430
OCDD	pg/l	164 G	62900
2,3,7,8-TCDF	pg/l	--	1560
1,2,3,7,8-PeCDF	pg/l	--	5350
2,3,4,7,8-PeCDF	pg/l	--	299300
1,2,3,4,7,8-HxCDF	pg/l	32.7 G	280000
1,2,3,6,7,8-HxCDF	pg/l	23.8 G	37200
2,3,4,6,7,8-HxCDF	pg/l	--	14400
1,2,3,7,8,9-HxCDF	pg/l	--	21200
1,2,3,4,6,7,8-HpCDF	pg/l	175 G	570000
1,2,3,4,7,8,9-HpCDF	pg/l	--	24800
OCDF	pg/l	363 G	990000

pg/l = picograms per liter

Upon evaluation of positive results reported for the sediment samples in this delivery group the following samples exhibited result concentrations less than five times that of the associated rinse blanks for the analytes indicated. Therefore based upon professional judgement, each of the affected sample results has been qualified EMPC at the reported concentration.

Analyte	C01-SD1-000-006	C01-SD1-006-012	SD-00-C01-006	C01-SD1-012-018	C01-SD1-018-024	C01-SD1-024-030	C01-SD1-030-036
2,3,7,8-TCDD	x	x	x	x	x	x	x
1,2,3,7,8-PeCDD	x	x	x	x	x	x	x
1,2,3,4,7,8-HxCDD	x	x	x	x	x	x	x
1,2,3,6,7,8-HxCDD		x				x	x
1,2,3,7,8,9-HxCDD		x				x	x
1,2,3,4,6,7,8-HpCDD		x					
OCDD		x					
2,3,7,8-TCDF		x				x	x
1,2,3,7,8-PeCDF	x	x	x	x	x	x	x
2,3,4,7,8-PeCDF	x	x	x	x	x	x	x
1,2,3,4,7,8-HxCDF	x	x	x	x	x	x	x
1,2,3,6,7,8-HxCDF	x	x	x	x	x	x	x
2,3,4,6,7,8-HxCDF	x	x	x	x	x	x	x
1,2,3,7,8,9-HxCDF	x	x	x	x	x	x	x
1,2,3,4,6,7,8-HpCDF	x	x	x	x	x	x	x
1,2,3,4,7,8,9-HpCDF	x	x	x	x	x	x	x
OCDF	x	x	x	x	x	x	x

Method Blanks

Method blanks were prepared and analyzed in association with the samples in this delivery group at the specified frequency. Upon examination of method blank data no analyte was positively identified at a concentration above or below the method defined minimum levels in any associated method blank.

FIELD DUPLICATE

Samples C01-SD1-006-012 and SD-00-C01-006 comprise the field duplicate pair. Field precision was adequately demonstrated since the relative percent difference between positive results obtained for the pair was less than 50% when results are greater than five times the project quantitation limit (PQL) and results reported for the pair differ by less than two times the PQL when results are less than five times the PQL with following exception noted.

Field precision was not adequately demonstrated in the case of 2,3,7,8-TCDD. The observed relative percent difference (52.9%) for positive 2,3,7,8-TCDD results reported for the pair does not meet the acceptance criteria described above. For this reason, the 2,3,7,8-TCDD results were qualified as estimated, “J” in each of the samples comprising the field duplicate pair.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Sample C01-SD1-018-024 was analyzed as a matrix spike/matrix spike (MS/MSD) duplicate pair. Upon evaluation all precision and accuracy indicators were favorable.

INTERNAL STANDARD

Internal standards ($^{13}C_{12}$-1,2,3,4-TCDD, $^{13}C_{12}$-1,2,3,4-TCDF and $^{13}C_{12}$-1,2,3,4,6,9-HxCDF) are added to each sample and method blank extract prior to injection. The area counts for each of the recovery standards in each sample must fall within the range (+100% to –50%) percent of that observed during the analysis of the mid-level daily calibration check standard.

Upon evaluation all internal standard responses were within acceptable limits.

LABELED ANALOG STANDARDS

Calculated percent recoveries of labeled analog standards were within method and validation acceptance limits without exception.

OPR

Ongoing Precision and Recovery (OPR) standards were prepared and analyzed in association with the samples in this delivery group. All observed percent recoveries were within method 1613B allowable limits during the OPR determination.

IPR

Initial Precision and Recovery (IPR) standards were prepared and analyzed successfully by the laboratory. All observed average concentration and standard deviation values passed method defined acceptance criteria.

CLEAN-UP RECOVERY STANDARD

The clean-up recovery standard (^{37}Cl 2,3,7,8-TCDD) was successfully recovered from the sediment samples in the delivery group.

SECOND COLUMN CONFIRMATION

Positive sample results (above the method defined minimum level) for the following analytes in the delivery group were confirmed via Sp-2331 column analyses:

2,3,7,8-TCDF
1,2,3,7,8-PeCDF
2,3,4,7,8-PeCDF
1,2,3,4,7,8-HxCDF
1,2,3,6,7,8-HxCDF
2,3,4,6,7,8-HxCDF
1,2,3,7,8,9-HxCDF

The validator has reported positive results for the compounds listed above from data obtained on the Sp-2331 analytical column in most cases. However, confirmation of positive results identified for these congeners during the primary analysis (DB-5) serves to further isolate the target analyte from co-eluting species and thereby limits the potential for high bias in reporting. Therefore, each of the two positive results identified (DB-5 and Sp-2331) have been compared and the lower value is reported. Also, each set of quality control (QC) has been evaluated independently. When a QC failure is identified on a particular column, sample results are reported from the column which is fully compliant regardless of the relative concentration values obtained.

OTHER QC DATA OUT OF SPECIFICATION

None.

SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall the laboratory data generated met the project goals and quality control criteria.

Data Validation Qualifiers

Qualifier	Description
J	Estimated value (bias undetermined) – The analyte was positively identified; but the associated numerical value is the approximate concentration of the analyte in the sample.
JH	Estimated value (potential high bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential high bias, of the analyte in the sample.
JL	Estimated value (potential low bias) – The analyte was positively identified; but the associated numerical value is the approximate concentration, with a potential low bias, of the analyte in the sample.
U	Non-detected value - The result initially reported as positive by the laboratory was qualified as not detected per USEPA Region II validation guidance, due to an associated quality control failure.
UJ	Estimated non-detect - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
UJL	Estimated non-detect (potential low bias) – The analyte was not detected and the report sample quantitation limit is biased low.
UJH	Estimated non-detect (potential high bias) – The analyte was not detected and the reported sample quantitation limit is biased high.
NJ	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
NJH	The organic analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration with a potential high bias, of the analyte concentration.
EMPC	Estimated Maximum Possible Concentration (EMPC).
R	The sample results are rejected. Due to a significant QA/QC problem, the analysis is invalid and provides no information as to whether the analyte is present or not.

Laboratory Qualifiers

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
EMPC	Estimated Maximum Possible Concentration (EMPC).
G	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the MDL or estimated detection limit (EDL), where appropriate.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

Validated Data Tables

Validated Data Table
FSIWP
Vista Analytical
SDG 1 - Dioxin

ANALYTE	UNITS	Split Rinse Blanks 11312	LQ	VQ
2378-TCDD	pg/l	2.32	EMPC	
12378-PeCDD	pg/l	1.79	U	
123478-HxCDD	pg/l	1.62	U	
123678-HxCDD	pg/l	1.93	U	
123789-HxCDD	pg/l	1.93	U	
1234678-HpCDD	pg/l	3.65	U	
OCDD	pg/l	2.51	U	
2378-TCDF	pg/l	0.946	U	
12378-PeCDF	pg/l	1.25	U	
23478-PeCDF	pg/l	1.2	U	
123478-HxCDF	pg/l	1.43	U	
123678-HxCDF	pg/l	1.39	U	
234678-HxCDF	pg/l	1.6	U	
123789-HxCDF	pg/l	2.01	U	
1234678-HpCDF	pg/l	2.04	U	
1234789-HpCDF	pg/l	2.19	U	
OCDF	pg/l	8.59	G	

This Page Intentionally Left Blank

Validated Data Table
FSIWP
Vista Analytical
SDG FSI001 - Dioxin

ANALYTE	UNITS	RB-20120108	LQ	VQ	RB-20120109-CL	LQ	VQ	RB-20120109	LQ	VQ
2378-TCDD	pg/L	1100		J	47.9	G	J	984		J
12378-PeCDD	pg/L	13.4	U	UJ	8.28	U	UJ	14.0	U	UJ
123478-HxCDD	pg/L	21.2	U	UJ	7.26	U	UJ	17.5	U	UJ
123678-HxCDD	pg/L	25.0	U	UJ	8.76	U	UJ	21.2	U	UJ
123789-HxCDD	pg/L	23.7	U	UJ	8.70	U	UJ	20.2	U	UJ
1234678-HpCDD	pg/L	92.0	G	J	31.6	U	UJ	111	EMPC	UJ
OCDD	pg/L	1100		J	164	G	J	24100		J
2378-TCDF	pg/L	22.9	U	UJ	13.8	U	UJ	24.3	G	J
12378-PeCDF	pg/L	35.1	EMPC	UJ	7.67	U	UJ	78.3	G,I	EMPC J
23478-PeCDF	pg/L	92.6	G	EMPC J	7.04	U	UJ	166	G	EMPC J
123478-HxCDF	pg/L	945		J	32.7	G	J	1610		J
123678-HxCDF	pg/L	535		J	23.8	G	J	204	G	EMPC J
234678-HxCDF	pg/L	65.2	G	J	8.58	U	UJ	100	G,I	J
123789-HxCDF	pg/L	23.6	U	UJ	11.1	U	UJ	46.7	G	J
1234678-HpCDF	pg/L	5330		EMPC J	175	G	J	8990	I	EMPC J
1234789-HpCDF	pg/L	139	EMPC	UJ	16.8	U	UJ	370		J
OCDF	pg/L	8380		J	363	G	J	74000		J

This Page Intentionally Left Blank

Validated Data Table
FSIWP
Vista Analytical
SDG FSI002 - Dioxin

ANALYTE	UNITS	B01-SD1-000-006	LQ	VQ	B01-SD1-012-018	LQ	VQ	B01-SD1-024-030	LQ	VQ	B01-SD1-036-042	LQ	VQ
2,3,7,8-TCDD	pg/g	8.82		EMPC	112			1110	D		2550	D	
1,2,3,7,8-PeCDD	pg/g	0.940	G		3.46	G		18.4			17.4		
1,2,3,4,7,8-HxCDD	pg/g	0.981	G		4.40	G		8.35			13.5		
1,2,3,6,7,8-HxCDD	pg/g	3.79			17.2			43.8			66.1		
1,2,3,7,8,9-HxCDD	pg/g	2.32	G		11.1			22.3			31.8		
1,2,3,4,6,7,8-HpCDD	pg/g	68.2			446			829			1020		
OCDD	pg/g	789			5990			10900	D		12100	D	
2,3,7,8-TCDF	pg/g	4.67			9.94			84.0			48.7		
1,2,3,7,8-PeCDF	pg/g	1.13	G		4.13	G		9.85			18.2		
2,3,4,7,8-PeCDF	pg/g	2.67	G	EMPC	9.53			29.2			72.1		
1,2,3,4,7,8-HxCDF	pg/g	3.93		EMPC	27.9			104			169		
1,2,3,6,7,8-HxCDF	pg/g	2.88	G	EMPC	12.86		EMPC	33.6			66.3		
2,3,4,6,7,8-HxCDF	pg/g	1.86	G	EMPC	7.95			18.5			44.8		
1,2,3,7,8,9-HxCDF	pg/g	1.79	G	EMPC	15.7	G		39.9			18.5		EMPC
1,2,3,4,6,7,8-HpCDF	pg/g	28.8		EMPC	273			731			976		
1,2,3,4,7,8,9-HpCDF	pg/g	2.14	G		11.1			29.8			37.4		
OCDF	pg/g	53.2		EMPC	462			1820			2220		

Validated Data Table
FSIWP
Vista Analytical
SDG FSI002 - Dioxin

ANALYTE	UNITS	B02-SD1-000-006	LQ	VQ	B02-SD1-012-018	LQ	VQ	B02-SD1-024-030	LQ	VQ	B02-SD1-036-042	LQ	VQ
2,3,7,8-TCDD	pg/g	7.57		EMPC	13.8		EMPC	99.5			94.9		
1,2,3,7,8-PeCDD	pg/g	0.629	G		0.565	EMPC		2.98	G		2.74	G	
1,2,3,4,7,8-HxCDD	pg/g	1.17	G		0.503	G		4.53			1.45	G	
1,2,3,6,7,8-HxCDD	pg/g	3.61			2.23	G		17.1			8.44		
1,2,3,7,8,9-HxCDD	pg/g	2.00	G		1.32	G		12.3			4.19		
1,2,3,4,6,7,8-HpCDD	pg/g	120			36.8			460			123		
OCDD	pg/g	1200			429			4530			1460		
2,3,7,8-TCDF	pg/g	2.75			2.67			7.82			5.55		
1,2,3,7,8-PeCDF	pg/g	0.555	EMPC		0.627	G		2.51	G		2.53	G	
2,3,4,7,8-PeCDF	pg/g	1.59	G	EMPC	1.57	G	EMPC	6.53			7.42		
1,2,3,4,7,8-HxCDF	pg/g	2.02	G	EMPC	2.28	G	EMPC	15.5		EMPC	10.0		EMPC
1,2,3,6,7,8-HxCDF	pg/g	1.43	G	EMPC	1.56	G	EMPC	8.25		EMPC	8.10		EMPC
2,3,4,6,7,8-HxCDF	pg/g	1.12	G	EMPC	2.29	G	EMPC	5.61			5.30		
1,2,3,7,8,9-HxCDF	pg/g	0.497	G		0.838	G		8.42	G		2.56	G	EMPC
1,2,3,4,6,7,8-HpCDF	pg/g	15.3		EMPC	15.2		EMPC	147		EMPC	78.0		EMPC
1,2,3,4,7,8,9-HpCDF	pg/g	1.12	G		1.23	G		7.72			4.27		
OCDF	pg/g	28.5		EMPC	27.6		EMPC	297		EMPC	104		EMPC

Validated Data Table
FSIWP
Vista Analytical
SDG FSI002 - Dioxin

ANALYTE	UNITS	B02-SD1-048-054	LQ	VQ	B02-SD1-060-066	LQ	VQ	A01-SD1-000-006	LQ	VQ	A01-SD1-006-012	LQ	VQ
2,3,7,8-TCDD	pg/g	14.8		EMPC	0.659	EMPC		791		M	750		M
1,2,3,7,8-PeCDD	pg/g	11.2			0.300	G		11.7		M	12.5		M
1,2,3,4,7,8-HxCDD	pg/g	7.40			0.454	U		10.2		M	10.4		M
1,2,3,6,7,8-HxCDD	pg/g	40.0			1.19	G		54.2		M	66.7		M
1,2,3,7,8,9-HxCDD	pg/g	22.9			0.612	U		30.2		M	37.3		M
1,2,3,4,6,7,8-HpCDD	pg/g	839			13.7			1100		M	1110		M
OCDD	pg/g	18100	D		248			16500	D	M	15300	D	M
2,3,7,8-TCDF	pg/g	24.2			2.94			38.5		M	46.6		M
1,2,3,7,8-PeCDF	pg/g	13.8			2.38	G		24.2		M	20.6		M
2,3,4,7,8-PeCDF	pg/g	59.3			2.37	G	EMPC	52.5		M	69.1		M
1,2,3,4,7,8-HxCDF	pg/g	45.2			4.43		EMPC	255		M	204		M
1,2,3,6,7,8-HxCDF	pg/g	55.4			5.44		EMPC	76.0		M	61.9		M
2,3,4,6,7,8-HxCDF	pg/g	45.6			1.84	EMPC		30.5		M	27.4		M
1,2,3,7,8,9-HxCDF	pg/g	35.5			0.58	EMPC		12.1		EMPC M	52.5		M
1,2,3,4,6,7,8-HpCDF	pg/g	683			29.8		EMPC	1180		M	959		M
1,2,3,4,7,8,9-HpCDF	pg/g	25.4			3.62			42.3		M	37.5		M
OCDF	pg/g	710			27.2		EMPC	1700		M	1550		M

Validated Data Table
FSIWP
Vista Analytical
SDG FSI002 - Dioxin

ANALYTE	UNITS	A01-SD1-012-018	LQ	VQ	A01-SD1-018-024	LQ	VQ	A01-SD1-024-030	LQ	VQ	A01-SD1-030-036	LQ	VQ
2,3,7,8-TCDD	pg/g	1910	D	M	2730	D	M	9240	D	M	13100	D	M
1,2,3,7,8-PeCDD	pg/g	24.4		M	18.0		M	33.4		M	62.5		M
1,2,3,4,7,8-HxCDD	pg/g	15.9		M	12.3		M	20.8		M	37.6		M
1,2,3,6,7,8-HxCDD	pg/g	146		M	89.4		M	142		M	231		M
1,2,3,7,8,9-HxCDD	pg/g	72.2		M	33.7		M	57.8		M	101		M
1,2,3,4,6,7,8-HpCDD	pg/g	2340		M	1660		M	2500		M	4210		M
OCDD	pg/g	32200	D	M	22700	D	M	37500	D	M	70800	D	M
2,3,7,8-TCDF	pg/g	86.6		M	61.4		M	89.2		M	132		M
1,2,3,7,8-PeCDF	pg/g	24.2		M	24.1		M	38.4		M	57.0		M
2,3,4,7,8-PeCDF	pg/g	116		M	56.2		M	90.7		M	137		M
1,2,3,4,7,8-HxCDF	pg/g	200		M	208		M	369		M	680		M
1,2,3,6,7,8-HxCDF	pg/g	65.0		M	68.1		M	107		M	176		M
2,3,4,6,7,8-HxCDF	pg/g	57.4		M	61.5		M	96.7		M	154		M
1,2,3,7,8,9-HxCDF	pg/g	18.1		M	23.6		M	21.1		M	46.0		M
1,2,3,4,6,7,8-HpCDF	pg/g	1020		M	968		M	1700		M	2810		M
1,2,3,4,7,8,9-HpCDF	pg/g	50.6		M	51.3		M	82.6		M	134		M
OCDF	pg/g	2170		M	2120		M	3870		M	7150		M

Validated Data Table
FSIWP
Vista Analytical
SDG FSI002 - Dioxin

ANALYTE	UNITS	SD1-00-A01-030	LQ	VQ	A01-SD1-036-042	LQ	VQ	A01-SD1-042-048	LQ	VQ
2,3,7,8-TCDD	pg/g	16900	D	M	18900	D	M	21100	D,E	M
1,2,3,7,8-PeCDD	pg/g	65.5		M	70.5		M	63.3		M
1,2,3,4,7,8-HxCDD	pg/g	36.7		M	32.2		M	30.1		M
1,2,3,6,7,8-HxCDD	pg/g	229		M	226		M	197		M
1,2,3,7,8,9-HxCDD	pg/g	96.2		M	91.7		M	80.3		M
1,2,3,4,6,7,8-HpCDD	pg/g	3990		M	3110		M	2510		M
OCDD	pg/g	66800	D	M	42800	D	M	30900	D	M
2,3,7,8-TCDF	pg/g	131		M	139		M	120		M
1,2,3,7,8-PeCDF	pg/g	54.7		M	61.3		M	52.6		M
2,3,4,7,8-PeCDF	pg/g	132		M	150		M	129		M
1,2,3,4,7,8-HxCDF	pg/g	669		M	936		M	770		M
1,2,3,6,7,8-HxCDF	pg/g	172		M	216		M	175		M
2,3,4,6,7,8-HxCDF	pg/g	151		M	162		M	135		M
1,2,3,7,8,9-HxCDF	pg/g	36.6	EMPC	M	24.6		M	90.5		M
1,2,3,4,6,7,8-HpCDF	pg/g	2910		M	3700		EMPC M	3400		M
1,2,3,4,7,8,9-HpCDF	pg/g	137		M	152		M	138		M
OCDF	pg/g	6840		M	7350		M	10200	D	M

This Page Intentionally Left Blank

Validated Data Table
FSIWP
Vista Analytical
SDG FSI003 - Dioxin

ANALYTE	UNITS	B01-SD1-006-012	LQ	VQ	B01-SD1-018-024	LQ	VQ	B01-SD1-030-036	LQ	VQ	B01-SD1-042-048	LQ	VQ
2,3,7,8-TCDD	pg/g	11.7		EMPC	25.5		EMPC	5720	D		137		M
1,2,3,7,8-PeCDD	pg/g	0.630	G		1.07	G		29.6			16.5		M
1,2,3,4,7,8-HxCDD	pg/g	0.771	G		1.12	G		14.1			10.8		M
1,2,3,6,7,8-HxCDD	pg/g	2.63	G		9.05			86.0			59.9		M
1,2,3,7,8,9-HxCDD	pg/g	1.79	G		3.16	G		40.0			31.3		M
1,2,3,4,6,7,8-HpCDD	pg/g	55.6	B		232	B	JL	1320	B		983	B	M
OCDD	pg/g	592	B		2670	B		15900	B,D		11500	B,D	M
2,3,7,8-TCDF	pg/g	3.09			4.54			555			38.4		M
1,2,3,7,8-PeCDF	pg/g	0.896	G		1.67	G		24.3			18.5		M
2,3,4,7,8-PeCDF	pg/g	1.98	G	EMPC	3.56			66.5			52.4		M
1,2,3,4,7,8-HxCDF	pg/g	3.69		EMPC	6.89		EMPC	212			88.2		M
1,2,3,6,7,8-HxCDF	pg/g	2.43	G	EMPC	4.87		EMPC	67.2		EMPC	60.3		EMPC
2,3,4,6,7,8-HxCDF	pg/g	1.76	G	EMPC	2.69	G		54.0			42.9		M
1,2,3,7,8,9-HxCDF	pg/g	2.22	G		1.70	G		32.9			20.6		M
1,2,3,4,6,7,8-HpCDF	pg/g	31.4		EMPC	55.0		EMPC	1270		EMPC	864		M
1,2,3,4,7,8,9-HpCDF	pg/g	2.28	G		3.98			53.4			38.4		M
OCDF	pg/g	59.9		EMPC	134		EMPC	2430			919		M

Validated Data Table
FSIWP
Vista Analytical
SDG FSI003 - Dioxin

ANALYTE	UNITS	B02-SD1-006-012	LQ	VQ	B02-SD1-018-024	LQ	VQ	B02-SD1-030-036	LQ	VQ	SD-00-B02-030	LQ	VQ
2,3,7,8-TCDD	pg/g	4.96		EMPC	130			2980	D		3190	D	
1,2,3,7,8-PeCDD	pg/g	0.328	G		0.999	EMPC		9.29			10.5		
1,2,3,4,7,8-HxCDD	pg/g	0.436	G		0.852	G		5.05			5.47		
1,2,3,6,7,8-HxCDD	pg/g	1.64	G		4.09			31.8			34.3		
1,2,3,7,8,9-HxCDD	pg/g	1.02	G		2.32	G		14.6			14.9		
1,2,3,4,6,7,8-HpCDD	pg/g	28.4	B		78.0	B		470	B		540	B	
OCDD	pg/g	299	B		1080	B		4880	B		5600	B	
2,3,7,8-TCDF	pg/g	1.36			6.00			79.2			79.9		
1,2,3,7,8-PeCDF	pg/g	0.506	G		1.42	G		11.7			10.4		
2,3,4,7,8-PeCDF	pg/g	1.06	G	EMPC	3.24		EMPC	32.2			33.1		
1,2,3,4,7,8-HxCDF	pg/g	1.80	G	EMPC	6.11		EMPC	111			119		
1,2,3,6,7,8-HxCDF	pg/g	1.19	G	EMPC	3.35		EMPC	32.9		EMPC	34.4		EMPC
2,3,4,6,7,8-HxCDF	pg/g	0.862	G	EMPC	2.11	G	EMPC	20.9			19.0		
1,2,3,7,8,9-HxCDF	pg/g	0.365	G		2.45	G		8.11			25.3		
1,2,3,4,6,7,8-HpCDF	pg/g	12.4		EMPC	38.0		EMPC	618			639		
1,2,3,4,7,8,9-HpCDF	pg/g	1.04	G		2.40	G		22.5			23.7		
OCDF	pg/g	22.1		EMPC	85.2		EMPC	1450			1210		

Validated Data Table
FSIWP
Vista Analytical
SDG FSI003 - Dioxin

ANALYTE	UNITS	B02-SD1-042-048	LQ	VQ	B02-SD1-054-060	LQ	VQ	B02-SD1-066-072	LQ	VQ
2,3,7,8-TCDD	pg/g	10.2		EMPC	0.585	G	EMPC	0.263	G	EMPC
1,2,3,7,8-PeCDD	pg/g	4.53			0.527	G		0.149	U	
1,2,3,4,7,8-HxCDD	pg/g	3.06	G		0.262	G		0.210	U	
1,2,3,6,7,8-HxCDD	pg/g	16.1			1.95	G		0.234	U	
1,2,3,7,8,9-HxCDD	pg/g	8.40			0.878	G		0.218	U	
1,2,3,4,6,7,8-HpCDD	pg/g	239	B		21.0	B		1.33	G,B	EMPC
OCDD	pg/g	2600	B		245	B		35.1	B	EMPC
2,3,7,8-TCDF	pg/g	12.1			3.14			1.64		
1,2,3,7,8-PeCDF	pg/g	6.84			1.48	G		1.04	G	
2,3,4,7,8-PeCDF	pg/g	20.6			5.03			0.720	G	EMPC
1,2,3,4,7,8-HxCDF	pg/g	25.5		EMPC	3.31		EMPC	1.43	G	EMPC
1,2,3,6,7,8-HxCDF	pg/g	21.7			3.80		EMPC	1.36	G	EMPC
2,3,4,6,7,8-HxCDF	pg/g	16.4			4.01		EMPC	0.559	G	EMPC
1,2,3,7,8,9-HxCDF	pg/g	16.5			3.92	G		0.256	EMPC	
1,2,3,4,6,7,8-HpCDF	pg/g	264			30.1		EMPC	3.91		EMPC
1,2,3,4,7,8,9-HpCDF	pg/g	10.7			1.96	G		0.630	G	
OCDF	pg/g	242		EMPC	23.1		EMPC	4.11	G	EMPC

This Page Intentionally Left Blank

Validated Data Table
FSIWP
Vista Analytical
SDG FSI004 - Dioxin

ANALYTE	UNITS	A01-SD1-048-054	LQ	VQ	A01-SD1-054-060	LQ	VQ	A01-SD1-060-066	LQ	VQ	A01-SD1-066-072	LQ	VQ	A01-SD1-072-078
2378-TCDD	pg/g	27100	D,E	J	16400	D	M	8850	D		65.1		J	6.75
12378-PeCDD	pg/g	54.8		M	49.0		M	23.5			3.96	G		1.62
123478-HxCDD	pg/g	25.1		M	27.5		M	12.3			3.20	G		0.787
123678-HxCDD	pg/g	181		M	184		M	86.1			19.2			3.32
123789-HxCDD	pg/g	70.1		M	75.9		M	38.7			8.96			1.66
1234678-HpCDD	pg/g	2230		M	3360		M	1370			339			42.5
OCDD	pg/g	27500	B,D	M	56900	B,D	M	14700	B,D		5870	B		1670
2378-TCDF	pg/g	138		M	128		M	330			22.0			8.55
12378-PeCDF	pg/g	62.8		M	61.1		M	29.8			25.6			9.17
23478-PeCDF	pg/g	289		M	139		M	77.2			28.1			6.75
123478-HxCDF	pg/g	907		M	729		M	215			63.9			18.2
123678-HxCDF	pg/g	210		M	172		M	70.4			87.4			23.2
234678-HxCDF	pg/g	94.7		M	96.0		M	42.0			37.4			6.15
123789-HxCDF	pg/g	178		M	128		M	43.4			24.2			5.72
1234678-HpCDF	pg/g	3770		M	3170		M	1280			467			82.0
1234789-HpCDF	pg/g	158		M	144		M	53.4			105			17.7
OCDF	pg/g	7060		M	6280		M	2840			880			107

Validated Data Table
FSIWP
Vista Analytical
SDG FSI004 - Dioxin

ANALYTE	UNITS	LQ	VQ	A01-SD1-078-084	LQ	VQ	A02-SD1-000-006	LQ	VQ	A02-SD1-006-012	LQ	VQ
2378-TCDD	pg/g		EMPC	5.69		EMPC	15900	D	M	9600	D	
12378-PeCDD	pg/g	G		0.192	U		35.5		M	80.1		
123478-HxCDD	pg/g	EMPC		0.229	U		17.9		M	14.6		
123678-HxCDD	pg/g	G		0.480	G		112		M	92.7		
123789-HxCDD	pg/g	G		0.287	G		46.5		M	41.4		
1234678-HpCDD	pg/g			6.04			1720		M	1420		
OCDD	pg/g	B		216	B		27000	B,D	M	15300	B,D	
2378-TCDF	pg/g			2.38			92.3		M	384		
12378-PeCDF	pg/g			1.36	G		33.9		M	25.1		
23478-PeCDF	pg/g			1.42	G		88.5		M	77.7		
123478-HxCDF	pg/g			1.99	G		477		M	244		
123678-HxCDF	pg/g			1.08	G		125		M	76.6		
234678-HxCDF	pg/g			0.817	G		51.9		M	41.4		
123789-HxCDF	pg/g			0.866	U		28.2		M	18.7		
1234678-HpCDF	pg/g			5.20			1850		M	1330		
1234789-HpCDF	pg/g			1.16	G		81.6		M	60.7		
OCDF	pg/g			17.1			3590		M	2910		

Validated Data Table
FSIWP
Vista Analytical
SDG FSI004 - Dioxin

ANALYTE	UNITS	A02-SD1-012-018	LQ	VQ	A02-SD1-018-024	LQ	VQ	A02-SD1-024-030	LQ	VQ	A02-SD1-030-036	LQ	VQ
2378-TCDD	pg/g	248			26.9		EMPC	15.2		EMPC	8.38		EMPC
12378-PeCDD	pg/g	1.33	G		0.549	G		0.202	EMPC		0.169	U	
123478-HxCDD	pg/g	0.717	G		0.169	G		0.207	U		0.133	U	
123678-HxCDD	pg/g	4.06			0.456	EMPC		0.665	G		0.154	U	
123789-HxCDD	pg/g	2.09	G		0.331	G		0.611	G		0.162	U	
1234678-HpCDD	pg/g	67.5			6.97			21.8			2.93	G	
OCDD	pg/g	1520	B		237	B		1130	B		66.5	B	
2378-TCDF	pg/g	27.9			6.05			3.31			0.210	EMPC	
12378-PeCDF	pg/g	3.31	G		1.77	G		0.683	G		0.0749	G	
23478-PeCDF	pg/g	4.91			1.47	G		0.769	G		0.167	EMPC	
123478-HxCDF	pg/g	16.9			2.61	G		1.65	G		0.445	G	
123678-HxCDF	pg/g	5.50			0.976	G		0.652	G		0.166	G	
234678-HxCDF	pg/g	2.86	G		0.732	G		0.566	G		0.122	G	
123789-HxCDF	pg/g	4.07	G		0.484	G		0.278	G		0.167	U	
1234678-HpCDF	pg/g	57.3			5.03			5.32			2.03	G	
1234789-HpCDF	pg/g	5.73			0.782	G		0.549	G		0.145	U	
OCDF	pg/g	125			20.0			12.5			11.0		

Validated Data Table
FSIWP
Vista Analytical
SDG FSI004 - Dioxin

ANALYTE	UNITS	A02-SD1-036-042	LQ	VQ	A02-SD1-042-048	LQ	VQ	A02-SD1-048-054	LQ	VQ	A02-SD1-054-060	LQ	VQ
2378-TCDD	pg/g	9.63		EMPC	7.15		EMPC	4.13		EMPC	0.315	G	EMPC
12378-PeCDD	pg/g	0.137	U		0.134	U		0.0968	U		0.0936	U	
123478-HxCDD	pg/g	0.155	U		0.162	U		0.149	U		0.203	U	
123678-HxCDD	pg/g	0.153	G		0.185	U		0.171	U		0.225	U	
123789-HxCDD	pg/g	0.183	U		0.202	U		0.177	U		0.237	U	
1234678-HpCDD	pg/g	2.77	G		2.19	G		1.43	G		0.236	G	
OCDD	pg/g	48.5	B		45.0	B		22.3	B		4.95	G,B	
2378-TCDF	pg/g	0.341	G		0.138	U		0.131	U		0.0732	U	
12378-PeCDF	pg/g	0.112	U		0.094	U		0.0818	U		0.0510	U	
23478-PeCDF	pg/g	0.231	G		0.143	G		0.115	G		0.0513	U	
123478-HxCDF	pg/g	0.486	G		0.288	G		0.193	G		0.0544	U	
123678-HxCDF	pg/g	0.145	G		0.0806	G		0.0863	G		0.0579	U	
234678-HxCDF	pg/g	0.103	G		0.110	U		0.0708	G		0.0630	U	
123789-HxCDF	pg/g	0.112	U		0.144	U		0.0947	U		0.0865	U	
1234678-HpCDF	pg/g	1.99	G		1.10	G		0.768	G		0.101	EMPC	
1234789-HpCDF	pg/g	0.117	U		0.129	U		0.0801	U		0.0978	U	
OCDF	pg/g	5.39	G		3.83	G		2.21	G		0.426	G	

Validated Data Table
FSIWP
Vista Analytical
SDG FSI004 - Dioxin

ANALYTE	UNITS	SD-000-A02-054	LQ	VQ	A02-SD1-060-066	LQ	VQ	A02-SD1-066-072	LQ	VQ
2378-TCDD	pg/g	0.409	G	EMPC	0.363	G	EMPC	0.231	EMPC	
12378-PeCDD	pg/g	0.121	U		0.108	U		0.116	U	
123478-HxCDD	pg/g	0.183	U		0.157	U		0.298	U	
123678-HxCDD	pg/g	0.203	U		0.172	U		0.343	U	
123789-HxCDD	pg/g	0.206	U		0.177	U		0.324	U	
1234678-HpCDD	pg/g	0.527	G		0.155	U		0.259	U	
OCDD	pg/g	7.43	B		3.62	G,B		2.65	G,B	
2378-TCDF	pg/g	0.113	U		0.0799	U		0.0750	U	
12378-PeCDF	pg/g	0.0776	U		0.0536	U		0.0830	U	
23478-PeCDF	pg/g	0.0774	U		0.0520	U		0.0891	U	
123478-HxCDF	pg/g	0.0974	U		0.0572	U		0.133	U	
123678-HxCDF	pg/g	0.0975	U		0.0609	U		0.135	U	
234678-HxCDF	pg/g	0.116	U		0.0720	U		0.148	U	
123789-HxCDF	pg/g	0.140	U		0.0934	U		0.196	U	
1234678-HpCDF	pg/g	0.290	G		0.189	G		0.509	G	
1234789-HpCDF	pg/g	0.148	U		0.0881	U		0.132	U	
OCDF	pg/g	0.949	G		0.739	G		2.28	G	

This Page Intentionally Left Blank

Validated Data Table
FSIWP
Vista Analytical
SDG FSI005- Dioxin

ANALYTE	UNITS	A03-SD1-000-006	LQ	VQ	A03-SD1-006-012	LQ	VQ	A03-SD1-012-018	LQ	VQ	A03-SD1-018-024	LQ	VQ
2378-TCDD	pg/g	2070	D	M	1440	D		5930	D	M	9330	D	M
12378-PeCDD	pg/g	30.8		M	11.6			34.0		M	38.3		M
123478-HxCDD	pg/g	16.0		M	9.01			24.9		M	26.3		M
123678-HxCDD	pg/g	119		M	57.7			134		M	159		M
123789-HxCDD	pg/g	52.8		M	24.2			61.5		M	69.8		M
1234678-HpCDD	pg/g	1670		M	1450			3150		M	3390		M
OCDD	pg/g	21200	D	M	19700	D		56900	D	M	54800	D	M
2378-TCDF	pg/g	72.7		M	42.0			96.8		M	129		M
12378-PeCDF	pg/g	25.8		M	14.2			49.7		M	49.1		M
23478-PeCDF	pg/g	50.5		M	32.2			129		M	118		M
123478-HxCDF	pg/g	182		M	141			715		M	588		M
123678-HxCDF	pg/g	64.2		M	45.2			189		M	139		M
234678-HxCDF	pg/g	31.1		M	37.6			98.6		M	69.1		M
123789-HxCDF	pg/g	28.8		M	20.2			168		M	120		M
1234678-HpCDF	pg/g	896		M	678			4080		M	2910		M
1234789-HpCDF	pg/g	53.8		M	37.0			190		M	113		M
OCDF	pg/g	2480		M	1530		EMPC	7390		M	6650		M

Validated Data Table
FSIWP
Vista Analytical
SDG FSI005- Dioxin

ANALYTE	UNITS	A03-SD1-024-030	LQ	VQ	SD-00-A03-024	LQ	VQ	A03-SD1-030-036	LQ	VQ	A03-SD1-036-042	LQ	VQ
2378-TCDD	pg/g	10400	D	M	9350	D	M	18600	D	M	19100	D,E	J
12378-PeCDD	pg/g	42.3		M	50.4		M	69.7		M	62.5		M
123478-HxCDD	pg/g	27.0		M	27.8		M	32.2		M	31.1		M
123678-HxCDD	pg/g	161		M	162		M	221		M	214		M
123789-HxCDD	pg/g	74.3		M	75.7		M	90.8		M	96.1		M
1234678-HpCDD	pg/g	3150		M	3610		M	3840		M	3370		M
OCDD	pg/g	51200	D	M	63300	D	M	60900	D	M	48600	D	M
2378-TCDF	pg/g	133		M	126		M	140		M	132		M
12378-PeCDF	pg/g	51.8		M	62.7		M	70.3		M	69.9		M
23478-PeCDF	pg/g	128		M	129		M	174		M	176		M
123478-HxCDF	pg/g	522		M	614		M	881		M	917		M
123678-HxCDF	pg/g	137		M	149		M	207		EMPC	208		M
234678-HxCDF	pg/g	70.1		M	69.4		M	159		M	157		M
123789-HxCDF	pg/g	89.8		M	78.9		M	45.3		M	461		M
1234678-HpCDF	pg/g	2300		M	2500		M	3420		M	3910		M
1234789-HpCDF	pg/g	103		M	112		M	144		M	159		M
OCDF	pg/g	4680		M	5080		M	7150		M	8200		M

Validated Data Table
FSIWP
Vista Analytical
SDG FSI005- Dioxin

ANALYTE	UNITS	A03-SD1-042-048	LQ	VQ	A03-SD1-048-054	LQ	VQ	A03-SD1-054-060	LQ	VQ
2378-TCDD	pg/g	17500	D	M	13000	D	M	808	D	
12378-PeCDD	pg/g	61.6		M	44.6		M	19.5		
123478-HxCDD	pg/g	30.8		M	22.8		M	9.18		
123678-HxCDD	pg/g	207		M	150		M	54.6		
123789-HxCDD	pg/g	90.9		M	63.4		M	22.8		
1234678-HpCDD	pg/g	3190		M	2530		M	1230		
OCDD	pg/g	44800	D	M	36800	D	M	17600	D	
2378-TCDF	pg/g	149		M	181		M	162		
12378-PeCDF	pg/g	72.9		M	46.4		M	14.2		
23478-PeCDF	pg/g	173		M	124		M	46.8		
123478-HxCDF	pg/g	985		M	661		M	156		
123678-HxCDF	pg/g	222		M	150		M	45.7		
234678-HxCDF	pg/g	163		M	88.2		M	31.0		
123789-HxCDF	pg/g	41.6		M	102		M	28.4		
1234678-HpCDF	pg/g	4160		M	2710		M	628		
1234789-HpCDF	pg/g	167		M	116		M	38.1		
OCDF	pg/g	8970		M	5600		M	1440		EMPC

Validated Data Table
FSIWP
Vista Analytical
SDG FSI005- Dioxin

ANALYTE	UNITS	A03-SD1-060-066	LQ	VQ	A03-SD1-066-072	LQ	VQ	A03-SD1-072-078	LQ	VQ	A03-SD1-078-084	LQ	VQ
2378-TCDD	pg/g	2950	D	M	2370	D		1170	D		17.8		EMPC
12378-PeCDD	pg/g	49.6		M	41.6			22.6			0.733	G	
123478-HxCDD	pg/g	25.2		M	15.5			8.67			0.493	G	
123678-HxCDD	pg/g	142		M	102			58.1			2.94	G	
123789-HxCDD	pg/g	59.7		M	46.3			25.8			1.43	G	
1234678-HpCDD	pg/g	2320		M	1790			1030			45.2		
OCDD	pg/g	31400	D	M	21800	D		13000	D		489		EMPC
2378-TCDF	pg/g	424		M	313			169			2.75		
12378-PeCDF	pg/g	59.3		M	22.6			12.0			1.00	G	
23478-PeCDF	pg/g	216		JH	61.8			31.6			2.63	G	
123478-HxCDF	pg/g	1596		M	215			99.1			4.00		EMPC
123678-HxCDF	pg/g	296		M	64.4			37.6			3.24		EMPC
234678-HxCDF	pg/g	112		JH	75.2			39.4			4.68		
123789-HxCDF	pg/g	236		JL	39.7			20.7			1.89	G	
1234678-HpCDF	pg/g	5220	E	J	1120			612			40.1		EMPC
1234789-HpCDF	pg/g	264		M	58.4			31.8			1.86	G	
OCDF	pg/g	16600	D	M	4720			1320		EMPC	56.3		EMPC

This Page Intentionally Left Blank

Validated Data Table
FSIWP
Vista Analytical
SDG FSI006 - Dioxin

ANALYTE	UNITS	C01-SD1-000-006	LQ	VQ	C01-SD1-006-012	LQ	VQ	SD-00-C01-006	LQ	VQ
2378-TCDD	pg/g	863		EMPC	1190	D	EMPC J	692		EMPC J
12378-PeCDD	pg/g	11.2		EMPC	13.0		EMPC	12.4		EMPC
123478-HxCDD	pg/g	9.92		EMPC	11.7		EMPC	10.4		EMPC
123678-HxCDD	pg/g	51.1		M	55.1		M	52.2		M
123789-HxCDD	pg/g	26.8		M	30.6		M	28.4		M
1234678-HpCDD	pg/g	879		M	1030		M	941		M
OCDD	pg/g	10100		M	12200	D	M	11100	D	M
2378-TCDF	pg/g	42.6		M	44.2		M	40.4		M
12378-PeCDF	pg/g	24.9		EMPC	29.0		EMPC	28.1		EMPC
23478-PeCDF	pg/g	54.8		EMPC	61.7		EMPC	58.3		EMPC
123478-HxCDF	pg/g	310		EMPC	388		EMPC	370		EMPC
123678-HxCDF	pg/g	82.7		EMPC	105		EMPC	97.6		EMPC
234678-HxCDF	pg/g	35.3		EMPC	37.6		EMPC	34.1		EMPC
123789-HxCDF	pg/g	12.2		EMPC	14.0		EMPC	14.3		EMPC
1234678-HpCDF	pg/g	1250		EMPC	1790		EMPC	1590		EMPC
1234789-HpCDF	pg/g	45.2		EMPC	63.8		EMPC	54.1		EMPC
OCDF	pg/g	1820		EMPC	2860		EMPC	2370		EMPC

Validated Data Table
FSIWP
Vista Analytical
SDG FSI006 - Dioxin

ANALYTE	UNITS	C01-SD1-012-018	LQ	VQ	C01-SD1-018-024	LQ	VQ	C01-SD1-024-030	LQ	VQ
2378-TCDD	pg/g	755		EMPC	839		EMPC	292		EMPC
12378-PeCDD	pg/g	12.6		EMPC	13.9		EMPC	5.07	G	EMPC
123478-HxCDD	pg/g	10.1		EMPC	11.0		EMPC	4.19	G	EMPC
123678-HxCDD	pg/g	50.9		M	54.8		M	20.0		EMPC
123789-HxCDD	pg/g	27.3		M	30.4		M	10.3		EMPC
1234678-HpCDD	pg/g	879		M	978		M	399		M
OCDD	pg/g	10900	D	M	11600	D	M	4940		M
2378-TCDF	pg/g	44.6		M	48.5		M	17.8		EMPC
12378-PeCDF	pg/g	26.8		EMPC	29.2		EMPC	9.97		EMPC
23478-PeCDF	pg/g	54.7		EMPC	61.8		EMPC	21.8		EMPC
123478-HxCDF	pg/g	298		EMPC	356		EMPC	113		EMPC
123678-HxCDF	pg/g	82.7		EMPC	95.1		EMPC	29.4		EMPC
234678-HxCDF	pg/g	33.4		EMPC	34.7		EMPC	12.4		EMPC
123789-HxCDF	pg/g	12.7		EMPC	14.3		EMPC	24.3		EMPC
1234678-HpCDF	pg/g	1230		EMPC	1510		EMPC	443		EMPC
1234789-HpCDF	pg/g	46.2		EMPC	53.5		EMPC	18.8		EMPC
OCDF	pg/g	1850		EMPC	2200		EMPC	793		EMPC

Validated Data Table
FSIWP
Vista Analytical
SDG FSI006 - Dioxin

ANALYTE	UNITS	C01-SD1-030-036	LQ	VQ	RB-20120111	LQ	VQ
2378-TCDD	pg/g	674	EMPC		305000	D	J
12378-PeCDD	pg/g	6.89	EMPC		1810		J
123478-HxCDD	pg/g	5.57	EMPC		928		J
123678-HxCDD	pg/g	28.3	EMPC		1920		J
123789-HxCDD	pg/g	15.4	EMPC		685		J
1234678-HpCDD	pg/g	473	M		5430		J
OCDD	pg/g	5520	M		62900		J
2378-TCDF	pg/g	24.4	EMPC		1560		J
12378-PeCDF	pg/g	11.9	EMPC		5350		J
23478-PeCDF	pg/g	28.6	EMPC		29300	D	J
123478-HxCDF	pg/g	114	EMPC		280000	D	J
123678-HxCDF	pg/g	34.4	EMPC		37200	D	EMPC J
234678-HxCDF	pg/g	14.6	EMPC		14400	D	J
123789-HxCDF	pg/g	6.63	EMPC		21200	D	J
1234678-HpCDF	pg/g	456	EMPC		570000	D	J
1234789-HpCDF	pg/g	22.5	EMPC		24800		J
OCDF	pg/g	809	EMPC		990000	D	J

Laboratory Data With Qualifiers Added

Sample ID:	Split Rinse Blanks 11312				EPA Method 1613
Client Data		5/17/12 DW	**Sample Data**		**Laboratory Data**			
Name:	Tierra Solutions, Inc.		Matrix:	Aqueous	Lab Sample:	33547-001	Date Received:	14-Jan-12
Project:	SDG# 1		Sample Size:	0.819 L	QC Batch No.:	4243	Date Extracted:	30-Jan-12
Date Collected:	13-Jan-12				Date Analyzed DB-5:	4-Feb-12	Date Analyzed DB-225:	NA
Time Collected:	0000							

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND		2.32	
1,2,3,7,8-PeCDD	ND	1.79		
1,2,3,4,7,8-HxCDD	ND	1.62		
1,2,3,6,7,8-HxCDD	ND	1.93		
1,2,3,7,8,9-HxCDD	ND	1.93		
1,2,3,4,6,7,8-HpCDD	ND	3.65		
OCDD	ND	2.51		
2,3,7,8-TCDF	ND	0.946		
1,2,3,7,8-PeCDF	ND	1.25		
2,3,4,7,8-PeCDF	ND	1.20		
1,2,3,4,7,8-HxCDF	ND	1.43		
1,2,3,6,7,8-HxCDF	ND	1.39		
2,3,4,6,7,8-HxCDF	ND	1.60		
1,2,3,7,8,9-HxCDF	ND	2.01		
1,2,3,4,6,7,8-HpCDF	ND	2.04		
1,2,3,4,7,8,9-HpCDF	ND	2.19		
OCDF	8.59			G

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	86.4	25 - 164	
	13C-1,2,3,7,8-PeCDD	79.9	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	80.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	72.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	77.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	69.4	23 - 140	
	13C-OCDD	61.2	17 - 157	
	13C-2,3,7,8-TCDF	86.4	24 - 169	
	13C-1,2,3,7,8-PeCDF	73.8	24 - 185	
	13C-2,3,4,7,8-PeCDF	76.4	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	80.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	75.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	76.4	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	77.1	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	67.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	69.6	26 - 138	
	13C-OCDF	59.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	91.9	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 0.00258

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: FEB

Approved By: Martha M. Maier 26-Feb-2012 08:59

This Page Intentionally Left Blank

Sample ID: **RB-20120108** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Solvent	Lab Sample:	33536-004	Date Received:	14-Jan-12
Project:	FSI-001	Sample Size:	0.100 L	QC Batch No.:	4206	Date Extracted:	18-Jan-12
Date Collected:	8-Jan-12			Date Analyzed DB-5:	27-Jan-12	Dates Analyzed SP-2331:	25-Feb-12
Time Collected:	1713						

5/15/12 DW

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	1100 J			
1,2,3,7,8-PeCDD	ND	13.4 UJ		
1,2,3,4,7,8-HxCDD	ND	21.2		
1,2,3,6,7,8-HxCDD	ND	25.0		
1,2,3,7,8,9-HxCDD	ND	23.7		
1,2,3,4,6,7,8-HpCDD	92.0 J			G
OCDD	1100 J			
2,3,7,8-TCDF	ND	22.9 UJ		
1,2,3,7,8-PeCDF	ND		35.1 UJ	
2,3,4,7,8-PeCDF	~~128~~ 92.6 EMPC J			G
1,2,3,4,7,8-HxCDF	945 J			
1,2,3,6,7,8-HxCDF	535 J			
2,3,4,6,7,8-HxCDF	65.2 J			G
1,2,3,7,8,9-HxCDF	ND	23.6 UJ		
1,2,3,4,6,7,8-HpCDF	5330 EMPC J			
1,2,3,4,7,8,9-HpCDF	ND		139 UJ	
OCDF	8380 J			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	108	25 - 164	
	13C-1,2,3,7,8-PeCDD	115	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	102	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	93.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	98.1	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	101	23 - 140	
	13C-OCDD	103	17 - 157	
	13C-2,3,7,8-TCDF	106	24 - 169	
	13C-1,2,3,7,8-PeCDF	105	24 - 185	
	13C-2,3,4,7,8-PeCDF	125 ~~107~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	104	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	97.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	101	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	103	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	104	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	106	26 - 138	
	13C-OCDF	103	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	113	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **1350**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: FEB

Approved By: Calvin Tanaka 02-Mar-2012 10:44

Sample ID: **RB-20120109-CL** **EPA Method 1613**

5/16/12 DW

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Solvent	Lab Sample:	33536-005	Date Received:	14-Jan-12
Project:	FSI-001	Sample Size:	0.100 L	QC Batch No.:	4206	Date Extracted:	18-Jan-12
Date Collected:	9-Jan-12			Date Analyzed DB-5:	27-Jan-12	Date Analyzed DB-225:	NA
Time Collected:	1538						

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	47.9 J			G
1,2,3,7,8-PeCDD	ND	8.28	UJ	
1,2,3,4,7,8-HxCDD	ND	7.26		
1,2,3,6,7,8-HxCDD	ND	8.76		
1,2,3,7,8,9-HxCDD	ND	8.70		
1,2,3,4,6,7,8-HpCDD	ND	31.6		
OCDD	164 J			G
2,3,7,8-TCDF	ND	13.8	UJ	
1,2,3,7,8-PeCDF	ND	7.67		
2,3,4,7,8-PeCDF	ND	7.04		
1,2,3,4,7,8-HxCDF	32.7 J			G
1,2,3,6,7,8-HxCDF	23.8 J			G
2,3,4,6,7,8-HxCDF	ND	8.58	UJ	
1,2,3,7,8,9-HxCDF	ND	11.1		
1,2,3,4,6,7,8-HpCDF	175 J			G
1,2,3,4,7,8,9-HpCDF	ND	16.8	UJ	
OCDF	363 J			G

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	104	25 - 164	
	13C-1,2,3,7,8-PeCDD	113	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	101	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	92.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	98.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	99.7	23 - 140	
	13C-OCDD	102	17 - 157	
	13C-2,3,7,8-TCDF	102	24 - 169	
	13C-1,2,3,7,8-PeCDF	106	24 - 185	
	13C-2,3,4,7,8-PeCDF	109	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	104	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	95.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	98.8	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	103	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	105	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	108	26 - 138	
	13C-OCDF	102	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	114	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **55.5**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: FEB

Approved By: Calvin Tanaka 02-Mar-2012 10:44

Sample ID: **RB-20120109** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Solvent	Lab Sample:	33536-006	Date Received:	14-Jan-12
Project:	FSI-001	Sample Size:	0.100 L	QC Batch No.:	4206	Date Extracted:	18-Jan-12
Date Collected:	9-Jan-12			Date Analyzed DB-5:	27-Jan-12	Dates Analyzed SP-2331:	25-Feb-12
Time Collected:	1610						

DKW 5/15/12

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	984 J			
1,2,3,7,8-PeCDD	ND	14.0 UJ		
1,2,3,4,7,8-HxCDD	ND	17.5		
1,2,3,6,7,8-HxCDD	ND	21.2		
1,2,3,7,8,9-HxCDD	ND	20.2		
1,2,3,4,6,7,8-HpCDD	ND		111 UJ	
OCDD	24100 J			
2,3,7,8-TCDF	24.3 J			G
1,2,3,7,8-PeCDF	78.3 EMPC J			G,I
2,3,4,7,8-PeCDF	~~173~~ 166 EMPC J			G
1,2,3,4,7,8-HxCDF	~~1670~~ 1610 J			
1,2,3,6,7,8-HxCDF	~~758~~ 204 EMPC J			G
2,3,4,6,7,8-HxCDF	100 J			G,I
1,2,3,7,8,9-HxCDF	46.7 J			G
1,2,3,4,6,7,8-HpCDF	8990 EMPC J			I
1,2,3,4,7,8,9-HpCDF	370 J			
OCDF	74000 J			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	107	25 - 164	
	13C-1,2,3,7,8-PeCDD	113	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	103	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	96.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	102	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	104	23 - 140	
	13C-OCDD	108	17 - 157	
	13C-2,3,7,8-TCDF	102	24 - 169	
	13C-1,2,3,7,8-PeCDF	106 ~~106~~	24 - 185	
	13C-2,3,4,7,8-PeCDF	123 ~~109~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	93.0 ~~106~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	91.5 ~~97.3~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	103	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	108	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	109	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	108	26 - 138	
	13C-OCDF	109	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	119	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **1420**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: FEB

Approved By: Calvin Tanaka 02-Mar-2012 10:44

This Page Intentionally Left Blank

Sample ID: B01-SD1-000-006 — **EPA Method 1613**

DLW 5-15-12

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-001	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.1 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	10-Jan-12	%Solids:	74.5	Date Analyzed DB-5:	5-Feb-12	Dates Analyzed SP-2331:	25-Feb-12
Time Collected:	0940						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	8.82		EMPC	
1,2,3,7,8-PeCDD	0.940			G
1,2,3,4,7,8-HxCDD	0.981			G
1,2,3,6,7,8-HxCDD	3.79			
1,2,3,7,8,9-HxCDD	2.32			G
1,2,3,4,6,7,8-HpCDD	68.2			
OCDD	789			
2,3,7,8-TCDF	4.67			
1,2,3,7,8-PeCDF	1.13			G
2,3,4,7,8-PeCDF	2.67		EMPC	G
1,2,3,4,7,8-HxCDF	3.93		EMPC	
1,2,3,6,7,8-HxCDF	2.88		EMPC	G
2,3,4,6,7,8-HxCDF	1.86		EMPC	G
1,2,3,7,8,9-HxCDF	~~0.762~~ 1.79			G
1,2,3,4,6,7,8-HpCDF	28.8		EMPC	
1,2,3,4,7,8,9-HpCDF	2.14			G
OCDF	53.2		EMPC	

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	96.4	25 - 164	
	13C-1,2,3,7,8-PeCDD	88.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	90.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	84.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	85.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	73.0	23 - 140	
	13C-OCDD	51.0	17 - 157	
	13C-2,3,7,8-TCDF	91.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	80.0	24 - 185	
	13C-2,3,4,7,8-PeCDF	81.7	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	94.2	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	86.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	87.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	85.1 ~~85.7~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	71.9	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	70.4	26 - 138	
	13C-OCDF	49.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	100	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 14.0

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 11:54

Sample ID: **B01-SD1-012-018**

EPA Method 1613

DLW 5/15/12

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-002	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.0 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	10-Jan-12	%Solids:	50.2	Date Analyzed DB-5:	5-Feb-12	Dates Analyzed SP-2331:	25-Feb-12
Time Collected:	1045						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	112			
1,2,3,7,8-PeCDD	3.46			G
1,2,3,4,7,8-HxCDD	4.40			G
1,2,3,6,7,8-HxCDD	17.2			
1,2,3,7,8,9-HxCDD	11.1			
1,2,3,4,6,7,8-HpCDD	446			
OCDD	5990			
2,3,7,8-TCDF	9.94			
1,2,3,7,8-PeCDF	4.13			G
2,3,4,7,8-PeCDF	9.53			
1,2,3,4,7,8-HxCDF	~~28.4~~ 27.9			
1,2,3,6,7,8-HxCDF	~~13.5~~ 12.86 EMPC			
2,3,4,6,7,8-HxCDF	7.95			
1,2,3,7,8,9-HxCDF	~~2.98~~ 15.7			G
1,2,3,4,6,7,8-HpCDF	273			
1,2,3,4,7,8,9-HpCDF	11.1			
OCDF	462			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	85.6	25 - 164	
	13C-1,2,3,7,8-PeCDD	84.1	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	83.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	77.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	79.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	70.9	23 - 140	
	13C-OCDD	55.0	17 - 157	
	13C-2,3,7,8-TCDF	82.7	24 - 169	
	13C-1,2,3,7,8-PeCDF	75.8	24 - 185	
	13C-2,3,4,7,8-PeCDF	76.3	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	93.5 ~~84.0~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	95.0 ~~76.6~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	79.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	76.8 ~~74.4~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	70.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	67.0	26 - 138	
	13C-OCDF	51.3	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	96.4	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **137**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 11:54

Sample ID: B01-SD1-024-030

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-003	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.0 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	10-Jan-12	%Solids:	53.2	Date Analyzed DB-5:	5-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1123						

5/15/12 DMW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	1110			D
1,2,3,7,8-PeCDD	18.4			
1,2,3,4,7,8-HxCDD	8.35			
1,2,3,6,7,8-HxCDD	43.8			
1,2,3,7,8,9-HxCDD	22.3			
1,2,3,4,6,7,8-HpCDD	829			
OCDD	10900			D
2,3,7,8-TCDF	84.0			
1,2,3,7,8-PeCDF	9.85			
2,3,4,7,8-PeCDF	29.2			
1,2,3,4,7,8-HxCDF	104			
1,2,3,6,7,8-HxCDF	33.6			
2,3,4,6,7,8-HxCDF	18.5			
1,2,3,7,8,9-HxCDF	39.9			
1,2,3,4,6,7,8-HpCDF	731			
1,2,3,4,7,8,9-HpCDF	29.8			
OCDF	1820			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	94.5	25 - 164	D
	13C-1,2,3,7,8-PeCDD	90.9	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	90.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	82.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	86.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	79.2	23 - 140	
	13C-OCDD	66.1	17 - 157	D
	13C-2,3,7,8-TCDF	91.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	82.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	95.6 ~~82.7~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	92.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	81.6	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	89.2 ~~85.2~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	84.2 ~~79.9~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	76.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	72.2	26 - 138	
	13C-OCDF	58.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	104	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 1190

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 12:30

Sample ID: **B01-SD1-036-042** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-004	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.1 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	10-Jan-12	%Solids:	54.4	Date Analyzed DB-5:	5-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1211						

5/15/12 DW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	2550			D
1,2,3,7,8-PeCDD	17.4			
1,2,3,4,7,8-HxCDD	13.5			
1,2,3,6,7,8-HxCDD	66.1			
1,2,3,7,8,9-HxCDD	31.8			
1,2,3,4,6,7,8-HpCDD	1020			
OCDD	12100			D
2,3,7,8-TCDF	48.7			
1,2,3,7,8-PeCDF	18.2			
2,3,4,7,8-PeCDF	72.1			
1,2,3,4,7,8-HxCDF	169			
1,2,3,6,7,8-HxCDF	66.3			
2,3,4,6,7,8-HxCDF	44.8			
1,2,3,7,8,9-HxCDF	~~18.7~~ 18.5 EMPC			
1,2,3,4,6,7,8-HpCDF	976			
1,2,3,4,7,8,9-HpCDF	37.4			
OCDF	2220			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	94.8	25 - 164	D
	13C-1,2,3,7,8-PeCDD	96.0	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.7	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	83.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	86.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	83.0	23 - 140	
	13C-OCDD	72.0	17 - 157	D
	13C-2,3,7,8-TCDF	93.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	87.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	98.5 ~~88.1~~	~~21~~ - 178	
	13C-1,2,3,4,7,8-HxCDF	92.8	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	83.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	112 ~~86.6~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	85.0 ~~83.0~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	81.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	76.8	26 - 138	
	13C-OCDF	63.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	111	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **2660**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 12:30

Sample ID: **B02-SD1-000-006** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-005	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.1 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	78.2	Date Analyzed DB-5:	5-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	0631						

5/15/12 DMW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	7.57 EMPC			
1,2,3,7,8-PeCDD	0.629			G
1,2,3,4,7,8-HxCDD	1.17			G
1,2,3,6,7,8-HxCDD	3.61			
1,2,3,7,8,9-HxCDD	2.00			G
1,2,3,4,6,7,8-HpCDD	120			
OCDD	1200			
2,3,7,8-TCDF	2.75			
1,2,3,7,8-PeCDF	ND		0.555	
2,3,4,7,8-PeCDF	1.59 EMPC			G
1,2,3,4,7,8-HxCDF	2.02 EMPC			G
1,2,3,6,7,8-HxCDF	~~1.62~~ 1.43 EMPC			G
2,3,4,6,7,8-HxCDF	~~2.15~~ 1.12 EMPC			G
1,2,3,7,8,9-HxCDF	0.497			G
1,2,3,4,6,7,8-HpCDF	15.3 EMPC			
1,2,3,4,7,8,9-HpCDF	1.12			G
OCDF	28.5 EMPC			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	51.2	25 - 164	
	13C-1,2,3,7,8-PeCDD	53.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	58.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	52.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	55.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	51.3	23 - 140	
	13C-OCDD	38.4	17 - 157	
	13C-2,3,7,8-TCDF	52.9 ~~48.7~~	24 - 169	
	13C-1,2,3,7,8-PeCDF	48.1	24 - 185	
	13C-2,3,4,7,8-PeCDF	57.3 ~~49.9~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	58.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	61.7 ~~52.5~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	62.3 ~~56.1~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	50.7	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	50.3	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	46.6	26 - 138	
	13C-OCDF	33.5	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	96.6	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 12.0

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 11:55

Sample ID: **B02-SD1-012-018** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-006	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.1 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	80.4	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	0655						

5/15/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	13.8 EMPC			
1,2,3,7,8-PeCDD	ND		0.565	
1,2,3,4,7,8-HxCDD	0.503			G
1,2,3,6,7,8-HxCDD	2.23			G
1,2,3,7,8,9-HxCDD	1.32			G
1,2,3,4,6,7,8-HpCDD	36.8			
OCDD	429			
2,3,7,8-TCDF	2.67			
1,2,3,7,8-PeCDF	0.627			G
2,3,4,7,8-PeCDF	1.57		EMPC	G
1,2,3,4,7,8-HxCDF	~~2.52~~ 2.28		EMPC	G
1,2,3,6,7,8-HxCDF	~~1.63~~ 1.56		EMPC	G
2,3,4,6,7,8-HxCDF	2.29		EMPC	G
1,2,3,7,8,9-HxCDF	~~0.619~~ 0.838			G
1,2,3,4,6,7,8-HpCDF	15.2 EMPC			
1,2,3,4,7,8,9-HpCDF	1.23			G
OCDF	27.6 EMPC			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	93.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	91.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	93.4	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	91.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	90.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	77.9	23 - 140	
	13C-OCDD	56.6	17 - 157	
	13C-2,3,7,8-TCDF	92.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	83.7	24 - 185	
	13C-2,3,4,7,8-PeCDF	95.6 ~~84.2~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	108 ~~93.6~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	120 ~~88.2~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	89.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	82.8 ~~84.3~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	77.2	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	80.2	26 - 138	
	13C-OCDF	56.3	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	104	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 16.3

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 11:55

Sample ID: B02-SD1-024-030 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-008	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.0 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	55.7	Date Analyzed DB-5:	5-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	0705						

5/15/12 DMS

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	99.5			
1,2,3,7,8-PeCDD	2.98			G
1,2,3,4,7,8-HxCDD	4.53			
1,2,3,6,7,8-HxCDD	17.1			
1,2,3,7,8,9-HxCDD	12.3			
1,2,3,4,6,7,8-HpCDD	460			
OCDD	4530			
2,3,7,8-TCDF	7.82			
1,2,3,7,8-PeCDF	2.51			G
2,3,4,7,8-PeCDF	6.53			
1,2,3,4,7,8-HxCDF	15.5		EMPC	
1,2,3,6,7,8-HxCDF	~~8.31~~ 8.25		EMPC	
2,3,4,6,7,8-HxCDF	5.61			
1,2,3,7,8,9-HxCDF	~~1.97~~ 8.42			G
1,2,3,4,6,7,8-HpCDF	147		EMPC	
1,2,3,4,7,8,9-HpCDF	7.72			
OCDF	297			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	95.2	25 - 164	
	13C-1,2,3,7,8-PeCDD	89.7	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	89.6	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	80.5	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	82.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	75.2	23 - 140	
	13C-OCDD	59.7	17 - 157	
	13C-2,3,7,8-TCDF	90.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	82.0	24 - 185	
	13C-2,3,4,7,8-PeCDF	98.0 ~~81.9~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	90.6	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	94.5 ~~84.2~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	93.7 ~~85.7~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	82.8 ~~81.9~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	74.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	72.2	26 - 138	
	13C-OCDF	56.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	103	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 119

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 11:55

Sample ID: **B02-SD1-036-042** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-009	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.1 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	77.7	Date Analyzed DB-5:	5-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	0722						

5/15/12 DMW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	94.9			
1,2,3,7,8-PeCDD	2.74			G
1,2,3,4,7,8-HxCDD	1.45			G
1,2,3,6,7,8-HxCDD	8.44			
1,2,3,7,8,9-HxCDD	4.19			
1,2,3,4,6,7,8-HpCDD	123			
OCDD	1460			
2,3,7,8-TCDF	5.55			
1,2,3,7,8-PeCDF	2.53			G
2,3,4,7,8-PeCDF	7.42			
1,2,3,4,7,8-HxCDF	10.0		EMPC	
1,2,3,6,7,8-HxCDF	8.10		EMPC	
2,3,4,6,7,8-HxCDF	5.30			
1,2,3,7,8,9-HxCDF	~~2.60~~ 2.56		~~EMPC~~	G
1,2,3,4,6,7,8-HpCDF	78.0		EMPC	
1,2,3,4,7,8,9-HpCDF	4.27			
OCDF	104		EMPC	

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	86.0	25 - 164	
	13C-1,2,3,7,8-PeCDD	82.0	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	86.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	77.8	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	80.3	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	74.0	23 - 140	
	13C-OCDD	54.4	17 - 157	
	13C-2,3,7,8-TCDF	82.7	24 - 169	
	13C-1,2,3,7,8-PeCDF	74.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	86.7	~~75.7~~ 21 - 178	
	13C-1,2,3,4,7,8-HxCDF	85.8	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	78.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	91.0	~~79.1~~ 28 - 136	
	13C-1,2,3,7,8,9-HxCDF	92.7	~~76.0~~ 29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	73.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	69.5	26 - 138	
	13C-OCDF	52.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	100	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **107**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 11:55

Sample ID: **B02-SD1-048-054** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-010	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.0 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12 5/15/12 DM	%Solids:	56.5	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	0900						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	14.8 EMPC			
1,2,3,7,8-PeCDD	11.2			
1,2,3,4,7,8-HxCDD	7.40			
1,2,3,6,7,8-HxCDD	40.0			
1,2,3,7,8,9-HxCDD	22.9			
1,2,3,4,6,7,8-HpCDD	839			
OCDD	18100			D
2,3,7,8-TCDF	24.2			
1,2,3,7,8-PeCDF	13.8			
2,3,4,7,8-PeCDF	59.3			
1,2,3,4,7,8-HxCDF	45.2			
1,2,3,6,7,8-HxCDF	~~57.1~~ 55.4			
2,3,4,6,7,8-HxCDF	45.6			
1,2,3,7,8,9-HxCDF	35.5			
1,2,3,4,6,7,8-HpCDF	683			
1,2,3,4,7,8,9-HpCDF	25.4			
OCDF	710			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	76.2	25 - 164	
	13C-1,2,3,7,8-PeCDD	73.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	80.6	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	80.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	79.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	75.8	23 - 140	
	13C-OCDD	61.6	17 - 157	D
	13C-2,3,7,8-TCDF	74.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	74.0	24 - 185	
	13C-2,3,4,7,8-PeCDF	76.9 ~~72.1~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	81.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	108 ~~75.7~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	106 ~~75.7~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	69.0 ~~73.8~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	72.7	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	73.0	26 - 138	
	13C-OCDF	59.1	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	93.5	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 93.1

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 11:55

Sample ID: **B02-SD1-060-066** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-011	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.0 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	77.2	Date Analyzed DB-5:	8-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	0915						

6/15/12 DW

Analyte	Conc. (pg/g)		DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND			0.659	
1,2,3,7,8-PeCDD	0.300				G
1,2,3,4,7,8-HxCDD	ND		0.454		
1,2,3,6,7,8-HxCDD	1.19				G
1,2,3,7,8,9-HxCDD	ND		0.612		
1,2,3,4,6,7,8-HpCDD	13.7				
OCDD	248				
2,3,7,8-TCDF	2.94				
1,2,3,7,8-PeCDF	2.38				G
2,3,4,7,8-PeCDF	2.37	EMPC			G
1,2,3,4,7,8-HxCDF	4.43	EMPC			
1,2,3,6,7,8-HxCDF	5.44	EMPC			
2,3,4,6,7,8-HxCDF	ND			1.84	
1,2,3,7,8,9-HxCDF	ND			~~1.20~~ 0.575	
1,2,3,4,6,7,8-HpCDF	29.8	EMPC			
1,2,3,4,7,8,9-HpCDF	3.62				
OCDF	27.2	EMPC			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	95.6	25 - 164	
	13C-1,2,3,7,8-PeCDD	90.9	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	87.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	81.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	83.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	74.9	23 - 140	
	13C-OCDD	63.1	17 - 157	
	13C-2,3,7,8-TCDF	95.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	87.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	86.0 ~~86.2~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	93.7	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	87.5	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	88.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	76.6 ~~84.2~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	76.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	82.1	26 - 138	
	13C-OCDF	69.0	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	100	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 3.04

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 05-Mar-2012 11:55

Sample ID: A01-SD1-000-006 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-012	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.1 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	37.8	Date Analyzed DB-5:	8-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1030						

5/15/12 DM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	791			
1,2,3,7,8-PeCDD	11.7			
1,2,3,4,7,8-HxCDD	10.2			
1,2,3,6,7,8-HxCDD	54.2			
1,2,3,7,8,9-HxCDD	30.2			
1,2,3,4,6,7,8-HpCDD	1100			
OCDD	16500			D
2,3,7,8-TCDF	38.5			
1,2,3,7,8-PeCDF	24.2			
2,3,4,7,8-PeCDF	52.5			
1,2,3,4,7,8-HxCDF	255			
1,2,3,6,7,8-HxCDF	76.0			
2,3,4,6,7,8-HxCDF	30.5			
1,2,3,7,8,9-HxCDF	~~60.6~~ 12.1 EMPC		M	M
1,2,3,4,6,7,8-HpCDF	1180			
1,2,3,4,7,8,9-HpCDF	42.3			
OCDF	1700			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	85.8	25 - 164	
	13C-1,2,3,7,8-PeCDD	91.1	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	82.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	75.5	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	78.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	78.1	23 - 140	
	13C-OCDD	64.9	17 - 157	D
	13C-2,3,7,8-TCDF	86.3	24 - 169	
	13C-1,2,3,7,8-PeCDF	82.2	24 - 185	
	13C-2,3,4,7,8-PeCDF	87.8 ~~86.9~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	85.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	78.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	110 ~~80.3~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	80.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	76.9	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	82.3	26 - 138	
	13C-OCDF	82.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	107	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 903

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 05-Mar-2012 11:55

Sample ID: A01-SD1-006-012

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-013	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.0 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	40.1	Date Analyzed DB-5:	8-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1040						

5/15/12 DW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	750			
1,2,3,7,8-PeCDD	12.5			
1,2,3,4,7,8-HxCDD	10.4			
1,2,3,6,7,8-HxCDD	66.7			
1,2,3,7,8,9-HxCDD	37.3			
1,2,3,4,6,7,8-HpCDD	1110			
OCDD	15300			D
2,3,7,8-TCDF	46.6			
1,2,3,7,8-PeCDF	20.6			
2,3,4,7,8-PeCDF	69.1			
1,2,3,4,7,8-HxCDF	204			
1,2,3,6,7,8-HxCDF	61.9			
2,3,4,6,7,8-HxCDF	27.4			
1,2,3,7,8,9-HxCDF	52.5			
1,2,3,4,6,7,8-HpCDF	959			
1,2,3,4,7,8,9-HpCDF	37.5			
OCDF	1550			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	83.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	90.3	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	80.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	74.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	77.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	76.6	23 - 140	
	13C-OCDD	68.9	17 - 157	D
	13C-2,3,7,8-TCDF	82.9	24 - 169	
	13C-1,2,3,7,8-PeCDF	83.2	24 - 185	
	13C-2,3,4,7,8-PeCDF	85.6 ~~84.7~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	84.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	75.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	106 ~~78.0~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	72.6 ~~78.6~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	75.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	81.8	26 - 138	
	13C-OCDF	78.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 861

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 05-Mar-2012 11:55

Sample ID: **A01-SD1-012-018** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-014	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.0 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	42.5	Date Analyzed DB-5:	8-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1048						

5/15/17 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	1910			D
1,2,3,7,8-PeCDD	24.4			
1,2,3,4,7,8-HxCDD	15.9			
1,2,3,6,7,8-HxCDD	146			
1,2,3,7,8,9-HxCDD	72.2			
1,2,3,4,6,7,8-HpCDD	2340			
OCDD	32200			D
2,3,7,8-TCDF	86.6			
1,2,3,7,8-PeCDF	24.2			
2,3,4,7,8-PeCDF	116			
1,2,3,4,7,8-HxCDF	200			
1,2,3,6,7,8-HxCDF	65.0			
2,3,4,6,7,8-HxCDF	~~32.0~~ 57.4			
1,2,3,7,8,9-HxCDF	18.1			
1,2,3,4,6,7,8-HpCDF	1020			
1,2,3,4,7,8,9-HpCDF	50.6			
OCDF	2170			

M

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	92.7	25 - 164	D
	13C-1,2,3,7,8-PeCDD	98.6	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	87.9	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	79.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	81.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	84.5	23 - 140	
	13C-OCDD	67.2	17 - 157	D
	13C-2,3,7,8-TCDF	91.9	24 - 169	
	13C-1,2,3,7,8-PeCDF	91.8	24 - 185	
	13C-2,3,4,7,8-PeCDF	92.7 ~~94.0~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	86.8	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	79.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	82.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	80.3 ~~82.4~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	78.9	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	86.3	26 - 138	
	13C-OCDF	84.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	98.3	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **2080**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 05-Mar-2012 12:30

Sample ID: A01-SD1-018-024

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-015	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.0 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	47.0	Date Analyzed DB-5:	8-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1057						

5/15/12 DW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	2730			D
1,2,3,7,8-PeCDD	18.0			
1,2,3,4,7,8-HxCDD	12.3			
1,2,3,6,7,8-HxCDD	89.4			
1,2,3,7,8,9-HxCDD	33.7			
1,2,3,4,6,7,8-HpCDD	1660			
OCDD	22700			D
2,3,7,8-TCDF	61.4			
1,2,3,7,8-PeCDF	24.1			
2,3,4,7,8-PeCDF	56.2			
1,2,3,4,7,8-HxCDF	208			
1,2,3,6,7,8-HxCDF	68.1			
2,3,4,6,7,8-HxCDF	~~31.7~~ 61.5			
1,2,3,7,8,9-HxCDF	23.6			
1,2,3,4,6,7,8-HpCDF	968			
1,2,3,4,7,8,9-HpCDF	51.3			
OCDF	2120			

M

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	79.1	25 - 164	D
	13C-1,2,3,7,8-PeCDD	93.9	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	81.9	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	72.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	78.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	79.6	23 - 140	
	13C-OCDD	61.6	17 - 157	D
	13C-2,3,7,8-TCDF	86.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	87.1	24 - 185	
	13C-2,3,4,7,8-PeCDF	83.8 ~~89.3~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	82.8	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	75.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	78.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	78.3 ~~78.7~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	75.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	82.2	26 - 138	
	13C-OCDF	78.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 2850

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 05-Mar-2012 12:30

Sample ID: A01-SD1-024-030

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-016	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.1 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	44.9	Date Analyzed DB-5:	8-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1107						

5/15/12 DW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	9240			D
1,2,3,7,8-PeCDD	33.4			
1,2,3,4,7,8-HxCDD	20.8			
1,2,3,6,7,8-HxCDD	142			
1,2,3,7,8,9-HxCDD	57.8			
1,2,3,4,6,7,8-HpCDD	2500			
OCDD	37500			D
2,3,7,8-TCDF	89.2			
1,2,3,7,8-PeCDF	38.4			
2,3,4,7,8-PeCDF	90.7			
1,2,3,4,7,8-HxCDF	369			
1,2,3,6,7,8-HxCDF	107			
2,3,4,6,7,8-HxCDF	~~49.1~~ 96.7			
1,2,3,7,8,9-HxCDF	21.1			
1,2,3,4,6,7,8-HpCDF	1700			
1,2,3,4,7,8,9-HpCDF	82.6			
OCDF	3870			

M

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	85.7	25 - 164	D
	13C-1,2,3,7,8-PeCDD	101	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	88.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	76.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	83.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	87.3	23 - 140	
	13C-OCDD	69.2	17 - 157	D
	13C-2,3,7,8-TCDF	89.7	24 - 169	
	13C-1,2,3,7,8-PeCDF	92.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	101 ~~88.4~~ ~~92.9~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	90.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	80.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	85.1	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	77.8 ~~102~~ ~~84.7~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	84.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	87.7	26 - 138	
	13C-OCDF	86.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	141	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 9440

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 12:30

Sample ID: A01-SD1-030-036

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-017	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.2 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	38.1	Date Analyzed DB-5:	8-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1120						

5/15/12 DW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	13100	M		D
1,2,3,7,8-PeCDD	62.5			
1,2,3,4,7,8-HxCDD	37.6			
1,2,3,6,7,8-HxCDD	231			
1,2,3,7,8,9-HxCDD	101			
1,2,3,4,6,7,8-HpCDD	4210			
OCDD	70800			D
2,3,7,8-TCDF	132			
1,2,3,7,8-PeCDF	~~57.0~~ ~~54.7~~ 57.0			
2,3,4,7,8-PeCDF	137			
1,2,3,4,7,8-HxCDF	680			
1,2,3,6,7,8-HxCDF	176			
2,3,4,6,7,8-HxCDF	~~87.4~~ 154			
1,2,3,7,8,9-HxCDF	46.0			
1,2,3,4,6,7,8-HpCDF	2810			
1,2,3,4,7,8,9-HpCDF	134			
OCDF	7150			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	83.5	25 - 164	D
	13C-1,2,3,7,8-PeCDD	103	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	83.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	77.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	81.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	86.8	23 - 140	
	13C-OCDD	73.6	17 - 157	D
	13C-2,3,7,8-TCDF	90.7	24 - 169	
	13C-1,2,3,7,8-PeCDF	93.9 ~~93.9~~	24 - 185	
	13C-2,3,4,7,8-PeCDF	88.4 ~~95.5~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	87.9	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	77.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	83.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	102 ~~85.8~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	83.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	88.7	26 - 138	
	13C-OCDF	85.1	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	132	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 13400

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 12:30

Sample ID: SD-00-A01-030

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-018	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.1 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	38.2	Date Analyzed DB-5:	8-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	0000						

5/15/12 DW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	16900			D
1,2,3,7,8-PeCDD	65.5			
1,2,3,4,7,8-HxCDD	36.7			
1,2,3,6,7,8-HxCDD	229			
1,2,3,7,8,9-HxCDD	96.2			
1,2,3,4,6,7,8-HpCDD	3990			
OCDD	66800			D
2,3,7,8-TCDF	131			
1,2,3,7,8-PeCDF	54.7			
2,3,4,7,8-PeCDF	132			
1,2,3,4,7,8-HxCDF	669			
1,2,3,6,7,8-HxCDF	172			
2,3,4,6,7,8-HxCDF	~~78.2~~ 151			
1,2,3,7,8,9-HxCDF	ND		36.6	
1,2,3,4,6,7,8-HpCDF	2910			
1,2,3,4,7,8,9-HpCDF	137			
OCDF	6840			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	89.2	25 - 164	D
	13C-1,2,3,7,8-PeCDD	109	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	95.4	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	83.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	91.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	96.0	23 - 140	
	13C-OCDD	70.4	17 - 157	D
	13C-2,3,7,8-TCDF	99.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	101	24 - 185	
	13C-2,3,4,7,8-PeCDF	88.4 ~~103~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	96.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	85.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	91.6	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	95.6	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	90.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	97.2	26 - 138	
	13C-OCDF	94.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	152	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 17200

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 12:30

Sample ID: **A01-SD1-036-042**

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-019	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.1 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	40.9	Date Analyzed DB-5:	8-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1135						

5/15/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	18900			D
1,2,3,7,8-PeCDD	70.5			
1,2,3,4,7,8-HxCDD	32.2			
1,2,3,6,7,8-HxCDD	226			
1,2,3,7,8,9-HxCDD	91.7			
1,2,3,4,6,7,8-HpCDD	3110			
OCDD	42800			D
2,3,7,8-TCDF	139			
1,2,3,7,8-PeCDF	61.3			
2,3,4,7,8-PeCDF	150			
1,2,3,4,7,8-HxCDF	936			
1,2,3,6,7,8-HxCDF	216			
2,3,4,6,7,8-HxCDF	~~93.0~~ 162			
1,2,3,7,8,9-HxCDF	24.6			
1,2,3,4,6,7,8-HpCDF	3700		EMPC	
1,2,3,4,7,8,9-HpCDF	152			
OCDF	7350			

M

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	94.0	25 - 164	D
	13C-1,2,3,7,8-PeCDD	107	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	93.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	76.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	86.4	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	89.8	23 - 140	
	13C-OCDD	74.7	17 - 157	D
	13C-2,3,7,8-TCDF	95.2	24 - 169	
	13C-1,2,3,7,8-PeCDF	97.1	24 - 185	
	13C-2,3,4,7,8-PeCDF	97.5 ~~97.5~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	93.1	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	82.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	88.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	102 ~~88.7~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	87.3	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	91.0	26 - 138	
	13C-OCDF	86.5	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	177	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **19300**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 05-Mar-2012 12:30

Sample ID: A01-SD1-042-048

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33541-020	Date Received:	12-Jan-12
Project:	FSI002	Sample Size:	10.2 g	QC Batch No.:	4236	Date Extracted:	29-Jan-12
Date Collected:	11-Jan-12	%Solids:	46.5	Date Analyzed DB-5:	8-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1148						

5/15/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	21100			D,E
1,2,3,7,8-PeCDD	63.3			
1,2,3,4,7,8-HxCDD	30.1			
1,2,3,6,7,8-HxCDD	197			
1,2,3,7,8,9-HxCDD	80.3			
1,2,3,4,6,7,8-HpCDD	2510			
OCDD	30900			D
2,3,7,8-TCDF	120			
1,2,3,7,8-PeCDF	52.6			
2,3,4,7,8-PeCDF	129			
1,2,3,4,7,8-HxCDF	770			
1,2,3,6,7,8-HxCDF	175			
2,3,4,6,7,8-HxCDF	~~78.1~~ 135			
1,2,3,7,8,9-HxCDF	90.5			
1,2,3,4,6,7,8-HpCDF	3400			
1,2,3,4,7,8,9-HpCDF	138			
OCDF	10200			D

M

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	89.8	25 - 164	D
	13C-1,2,3,7,8-PeCDD	110	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	95.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	79.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	89.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	94.2	23 - 140	
	13C-OCDD	78.8	17 - 157	D
	13C-2,3,7,8-TCDF	96.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	99.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	97.3 ~~98.8~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	94.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	85.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	90.6	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	86.3 ~~92.2~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	89.3	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	92.3	26 - 138	
	13C-OCDF	79.2	17 - 157	D
CRS	37Cl-2,3,7,8-TCDD	213	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 21400

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 05-Mar-2012 12:30

This Page Intentionally Left Blank

Sample ID: B01-SD1-006-012 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-001	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.1 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	10-Jan-12	%Solids:	80.5	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1030						

5/16/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	11.7 EMPC			
1,2,3,7,8-PeCDD	0.630			G
1,2,3,4,7,8-HxCDD	0.771			G
1,2,3,6,7,8-HxCDD	2.63			G
1,2,3,7,8,9-HxCDD	1.79			G
1,2,3,4,6,7,8-HpCDD	55.6			B
OCDD	592			B
2,3,7,8-TCDF	3.09			
1,2,3,7,8-PeCDF	0.896 ~~EMPC~~ DLW			G
2,3,4,7,8-PeCDF	1.98 EMPC			G
1,2,3,4,7,8-HxCDF	3.69 EMPC			
1,2,3,6,7,8-HxCDF	~~2.46~~ 2.43 EMPC			G
2,3,4,6,7,8-HxCDF	1.76 EMPC			G
1,2,3,7,8,9-HxCDF	~~0.640~~ 2.22			G
1,2,3,4,6,7,8-HpCDF	31.4 EMPC			
1,2,3,4,7,8,9-HpCDF	2.28			G
OCDF	59.9 EMPC			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	89.7	25 - 164	
	13C-1,2,3,7,8-PeCDD	88.7	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	90.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	94.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	76.4	23 - 140	
	13C-OCDD	57.5	17 - 157	
	13C-2,3,7,8-TCDF	87.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	86.2	24 - 185	
	13C-2,3,4,7,8-PeCDF	83.3 ~~84.7~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	91.7	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	99.0 ~~86.6~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	98.1 ~~85.9~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	66.3 ~~85.5~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	78.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	74.5	26 - 138	
	13C-OCDF	53.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 15.7

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 10:40

Sample ID: **B01-SD1-018-024** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-002	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.0 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	10-Jan-12	%Solids:	75.7	Date Analyzed DB-5:	16-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1059						

5/16/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	25.5 EMPC			
1,2,3,7,8-PeCDD	1.07			G
1,2,3,4,7,8-HxCDD	1.12			G
1,2,3,6,7,8-HxCDD	9.05			
1,2,3,7,8,9-HxCDD	3.16			G
1,2,3,4,6,7,8-HpCDD	232 JL			B
OCDD	2670			B
2,3,7,8-TCDF	4.54			
1,2,3,7,8-PeCDF	1.67			G
2,3,4,7,8-PeCDF	3.56			
1,2,3,4,7,8-HxCDF	6.89 EMPC			
1,2,3,6,7,8-HxCDF	~~5.04~~ 4.87 EMPC			
2,3,4,6,7,8-HxCDF	2.69			G
1,2,3,7,8,9-HxCDF	1.70			G
1,2,3,4,6,7,8-HpCDF	55.0 EMPC			
1,2,3,4,7,8,9-HpCDF	3.98			
OCDF	134 EMPC			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	88.4	25 - 164	
	13C-1,2,3,7,8-PeCDD	91.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	85.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	88.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	90.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	83.4	23 - 140	
	13C-OCDD	80.5	17 - 157	
	13C-2,3,7,8-TCDF	87.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	87.1	24 - 185	
	13C-2,3,4,7,8-PeCDF	79.7 ~~88.0~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	88.9	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	99.6 ~~84.1~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	83.4	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	86.1	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	84.9	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	86.7	26 - 138	
	13C-OCDF	78.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	99.7	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **34.9**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: MAS

Approved By: Calvin Tanaka 07-Mar-2012 10:40

Sample ID: B01-SD1-030-036 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-003	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.1 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	10-Jan-12	%Solids:	53.3	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	29-Feb-12
Time Collected:	1136						

5/16/17 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	5720			D
1,2,3,7,8-PeCDD	29.6			
1,2,3,4,7,8-HxCDD	14.1			
1,2,3,6,7,8-HxCDD	86.0			
1,2,3,7,8,9-HxCDD	40.0			
1,2,3,4,6,7,8-HpCDD	1320			B
OCDD	15900			B,D
2,3,7,8-TCDF	555			
1,2,3,7,8-PeCDF	24.3			
2,3,4,7,8-PeCDF	66.5			
1,2,3,4,7,8-HxCDF	~~216~~ 212			
1,2,3,6,7,8-HxCDF	67.2		EMPC	
2,3,4,6,7,8-HxCDF	54.0			
1,2,3,7,8,9-HxCDF	32.9			
1,2,3,4,6,7,8-HpCDF	1270		EMPC	
1,2,3,4,7,8,9-HpCDF	53.4			
OCDF	2430			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	94.0	25 - 164	D
	13C-1,2,3,7,8-PeCDD	93.1	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	90.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	92.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	86.5	23 - 140	
	13C-OCDD	77.4	17 - 157	D
	13C-2,3,7,8-TCDF	93.9	24 - 169	
	13C-1,2,3,7,8-PeCDF	87.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	109 ~~86.7~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	116 ~~93.4~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	89.4	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	139 ~~87.9~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	73.7 ~~90.7~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	83.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	81.6	26 - 138	
	13C-OCDF	60.3	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	145	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 5910

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: MAS

Approved By: Calvin Tanaka 07-Mar-2012 10:40

Sample ID: B01-SD1-042-048 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-004	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.0 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	10-Jan-12	%Solids:	49.2	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1227						

5/16/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	137 M			
1,2,3,7,8-PeCDD	16.5			
1,2,3,4,7,8-HxCDD	10.8			
1,2,3,6,7,8-HxCDD	59.9			
1,2,3,7,8,9-HxCDD	31.3			
1,2,3,4,6,7,8-HpCDD	983			B
OCDD	11500			B,D
2,3,7,8-TCDF	38.4			
1,2,3,7,8-PeCDF	18.5			
2,3,4,7,8-PeCDF	52.4			
1,2,3,4,7,8-HxCDF	88.2			
1,2,3,6,7,8-HxCDF	60.3 EMPC			
2,3,4,6,7,8-HxCDF	42.9 M			
1,2,3,7,8,9-HxCDF	~~30.4~~ 20.6 M			
1,2,3,4,6,7,8-HpCDF	864 M			
1,2,3,4,7,8,9-HpCDF	38.4			
OCDF	919			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	90.8	25 - 164	
	13C-1,2,3,7,8-PeCDD	89.5	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	89.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	86.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	94.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	80.2	23 - 140	
	13C-OCDD	76.8	17 - 157	D
	13C-2,3,7,8-TCDF	90.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	87.4	24 - 185	
	13C-2,3,4,7,8-PeCDF	87.2 ~~85.4~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	91.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	84.6	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	97.9 ~~84.8~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	82.1	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	79.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	75.0	26 - 138	
	13C-OCDF	54.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 229

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 10:40

Sample ID: B02-SD1-006-012 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-006	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.0 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	11-Jan-12	%Solids:	80.0	Date Analyzed DB-5:	16-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	0647						

5/16/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	4.96 EMPC			
1,2,3,7,8-PeCDD	0.328			G
1,2,3,4,7,8-HxCDD	0.436			G
1,2,3,6,7,8-HxCDD	1.64			G
1,2,3,7,8,9-HxCDD	1.02			G
1,2,3,4,6,7,8-HpCDD	28.4			B
OCDD	299			B
2,3,7,8-TCDF	1.36			
1,2,3,7,8-PeCDF	0.506			G
2,3,4,7,8-PeCDF	~~2.46~~ 1.06 EMPC			G
1,2,3,4,7,8-HxCDF	1.80 EMPC			G
1,2,3,6,7,8-HxCDF	1.19 EMPC			G
2,3,4,6,7,8-HxCDF	~~1.73~~ 0.862 EMPC			G
1,2,3,7,8,9-HxCDF	0.365			G
1,2,3,4,6,7,8-HpCDF	12.4 EMPC			
1,2,3,4,7,8,9-HpCDF	1.04			G
OCDF	22.1 EMPC			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	99.7	25 - 164	
	13C-1,2,3,7,8-PeCDD	97.7	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	89.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	84.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	91.1	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	84.3	23 - 140	
	13C-OCDD	76.0	17 - 157	
	13C-2,3,7,8-TCDF	93.7	24 - 169	
	13C-1,2,3,7,8-PeCDF	93.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	88.1 ~~92.5~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	96.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	87.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	103 ~~90.2~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	92.7	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	86.2	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	89.9	26 - 138	
	13C-OCDF	77.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	105	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 7.51

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: MAS

Approved By: Calvin Tanaka 07-Mar-2012 10:40

Sample ID: B02-SD1-018-024 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-007	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.0 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	11-Jan-12	%Solids:	79.2	Date Analyzed DB-5:	16-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	0658						

5/16/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	130			
1,2,3,7,8-PeCDD	ND		0.999	
1,2,3,4,7,8-HxCDD	0.852			G
1,2,3,6,7,8-HxCDD	4.09			
1,2,3,7,8,9-HxCDD	2.32			G
1,2,3,4,6,7,8-HpCDD	78.0			B
OCDD	1080			B
2,3,7,8-TCDF	6.00			
1,2,3,7,8-PeCDF	1.42			G
2,3,4,7,8-PeCDF	3.24		EMPC	
1,2,3,4,7,8-HxCDF	6.11		EMPC	
1,2,3,6,7,8-HxCDF	3.35		EMPC	
2,3,4,6,7,8-HxCDF	2.11		EMPC	G
1,2,3,7,8,9-HxCDF	~~0.995~~ 2.45			G
1,2,3,4,6,7,8-HpCDF	38.0		EMPC	
1,2,3,4,7,8,9-HpCDF	2.40			G
OCDF	85.2		EMPC	

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	96.7	25 - 164	
	13C-1,2,3,7,8-PeCDD	99.6	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.7	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	84.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	90.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	87.9	23 - 140	
	13C-OCDD	79.4	17 - 157	
	13C-2,3,7,8-TCDF	93.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	95.1	24 - 185	
	13C-2,3,4,7,8-PeCDF	84.4 ~~93.9~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	99.7	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	85.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	107 ~~90.3~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	69 ~~92.0~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	88.9	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	96.6	26 - 138	
	13C-OCDF	79.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	109	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 135

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 07-Mar-2012 10:40

Sample ID: B02-SD1-030-036 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-008	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.0 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	11-Jan-12	%Solids:	67.3	Date Analyzed DB-5:	16-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	0716						

5/16/12 DW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	2980			D
1,2,3,7,8-PeCDD	9.29			
1,2,3,4,7,8-HxCDD	5.05			
1,2,3,6,7,8-HxCDD	31.8			
1,2,3,7,8,9-HxCDD	14.6			
1,2,3,4,6,7,8-HpCDD	470			B
OCDD	4880			B
2,3,7,8-TCDF	79.2			
1,2,3,7,8-PeCDF	11.7			
2,3,4,7,8-PeCDF	32.2			
1,2,3,4,7,8-HxCDF	111			
1,2,3,6,7,8-HxCDF	32.9 EMPC			
2,3,4,6,7,8-HxCDF	20.9			
1,2,3,7,8,9-HxCDF	~~26.1~~ 8.11			
1,2,3,4,6,7,8-HpCDF	618			
1,2,3,4,7,8,9-HpCDF	22.5			
OCDF	1450			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	90.5	25 - 164	D
	13C-1,2,3,7,8-PeCDD	99.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	82.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	89.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	90.1	23 - 140	
	13C-OCDD	67.4	17 - 157	
	13C-2,3,7,8-TCDF	92.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	93.4	24 - 185	
	13C-2,3,4,7,8-PeCDF	79.9 ~~93.3~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	97.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	85.4	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	95.2 ~~86.9~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	92.1	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	90.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	97.4	26 - 138	
	13C-OCDF	83.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	116	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 3040

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 07-Mar-2012 10:40

Sample ID: SD-00-B02-030 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-009	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.0 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	11-Jan-12	%Solids:	64.4	Date Analyzed DB-5:	16-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	0000						

5/16/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	3190			D
1,2,3,7,8-PeCDD	10.5			
1,2,3,4,7,8-HxCDD	5.47			
1,2,3,6,7,8-HxCDD	34.3			
1,2,3,7,8,9-HxCDD	14.9			
1,2,3,4,6,7,8-HpCDD	540			B
OCDD	5600			B
2,3,7,8-TCDF	79.9			
1,2,3,7,8-PeCDF	10.4			
2,3,4,7,8-PeCDF	33.1			
1,2,3,4,7,8-HxCDF	119			
1,2,3,6,7,8-HxCDF	34.4		EMPC	
2,3,4,6,7,8-HxCDF	19.0			
1,2,3,7,8,9-HxCDF	25.3			
1,2,3,4,6,7,8-HpCDF	639			
1,2,3,4,7,8,9-HpCDF	23.7			
OCDF	1210			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	92.1	25 - 164	D
	13C-1,2,3,7,8-PeCDD	102	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	91.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	86.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	99.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	92.4	23 - 140	
	13C-OCDD	87.6	17 - 157	
	13C-2,3,7,8-TCDF	93.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	94.7	24 - 185	
	13C-2,3,4,7,8-PeCDF	84.5 ~~96.0~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	93.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	81.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	95.4 ~~87.3~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	76.9 ~~96.3~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	91.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	97.2	26 - 138	
	13C-OCDF	83.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	119	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 3260

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 07-Mar-2012 10:40

Sample ID: B02-SD1-042-048 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-010	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.0 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	11-Jan-12	%Solids:	69.3	Date Analyzed DB-5:	16-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	0754						

5/16/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	10.2		EMPC	
1,2,3,7,8-PeCDD	4.53			
1,2,3,4,7,8-HxCDD	3.06			G
1,2,3,6,7,8-HxCDD	16.1			
1,2,3,7,8,9-HxCDD	8.40			
1,2,3,4,6,7,8-HpCDD	239			B
OCDD	2600			B
2,3,7,8-TCDF	12.1			
1,2,3,7,8-PeCDF	6.84			
2,3,4,7,8-PeCDF	20.6			
1,2,3,4,7,8-HxCDF	25.5		EMPC	
1,2,3,6,7,8-HxCDF	21.7			
2,3,4,6,7,8-HxCDF	16.4			
1,2,3,7,8,9-HxCDF	16.5			
1,2,3,4,6,7,8-HpCDF	264			
1,2,3,4,7,8,9-HpCDF	10.7			
OCDF	242		EMPC	

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	94.8	25 - 164	
	13C-1,2,3,7,8-PeCDD	101	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.9	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	84.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	103	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	91.5	23 - 140	
	13C-OCDD	85.8	17 - 157	
	13C-2,3,7,8-TCDF	92.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	95.2	24 - 185	
	13C-2,3,4,7,8-PeCDF	79.9 ~~95.6~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	97.6	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	83.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	93.9 ~~87.6~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	67.7 ~~94.7~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	91.7	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	98.1	26 - 138	
	13C-OCDF	84.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	104	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 39.1

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 07-Mar-2012 10:40

Sample ID: B02-SD1-054-060 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-011	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.1 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	11-Jan-12	%Solids:	78.2	Date Analyzed DB-5:	17-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	0907						

5/16/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	0.585 EMPC			G
1,2,3,7,8-PeCDD	0.527			G
1,2,3,4,7,8-HxCDD	0.262			G
1,2,3,6,7,8-HxCDD	1.95			G
1,2,3,7,8,9-HxCDD	0.878			G
1,2,3,4,6,7,8-HpCDD	21.0			B
OCDD	245			B
2,3,7,8-TCDF	3.14			
1,2,3,7,8-PeCDF	1.48			G
2,3,4,7,8-PeCDF	5.03			
1,2,3,4,7,8-HxCDF	3.31 EMPC			
1,2,3,6,7,8-HxCDF	3.80 EMPC			
2,3,4,6,7,8-HxCDF	4.01 EMPC			
1,2,3,7,8,9-HxCDF	~~1.23~~ 3.92			G
1,2,3,4,6,7,8-HpCDF	30.1 EMPC			
1,2,3,4,7,8,9-HpCDF	1.96			G
OCDF	23.1 EMPC			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	85.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	89.5	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	83.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	75.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	80.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	77.9	23 - 140	
	13C-OCDD	66.6	17 - 157	
	13C-2,3,7,8-TCDF	82.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	83.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	78.3 ~~84.0~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	87.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	77.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	88.3 ~~79.4~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	57.8 ~~81.8~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	80.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	85.5	26 - 138	
	13C-OCDF	70.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	99.0	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 5.13

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: MAS

Approved By: Calvin Tanaka 07-Mar-2012 10:40

Sample ID: B02-SD1-066-072 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33542-012	Date Received:	12-Jan-12
Project:	FSI003	Sample Size:	10.0 g	QC Batch No.:	4247	Date Extracted:	1-Feb-12
Date Collected:	11-Jan-12	%Solids:	80.7	Date Analyzed DB-5:	16-Feb-12	Dates Analyzed SP-2331:	29-Feb-12
Time Collected:	0921						

5/16/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	0.263 EMPC			G
1,2,3,7,8-PeCDD	ND	0.149		
1,2,3,4,7,8-HxCDD	ND	0.210		
1,2,3,6,7,8-HxCDD	ND	0.234		
1,2,3,7,8,9-HxCDD	ND	0.218		
1,2,3,4,6,7,8-HpCDD	1.33 EMPC			G,B
OCDD	35.1 EMPC			B
2,3,7,8-TCDF	~~1.80~~ 1.64			
1,2,3,7,8-PeCDF	1.04			G
2,3,4,7,8-PeCDF	~~0.763~~ 0.720 EMPC			G
1,2,3,4,7,8-HxCDF	1.43 EMPC			G
1,2,3,6,7,8-HxCDF	1.36 EMPC			G
2,3,4,6,7,8-HxCDF	0.559 EMPC			G
1,2,3,7,8,9-HxCDF	ND		0.256	
1,2,3,4,6,7,8-HpCDF	3.91 EMPC			
1,2,3,4,7,8,9-HpCDF	0.630			G
OCDF	4.11 EMPC			G

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	95.0	25 - 164	
	13C-1,2,3,7,8-PeCDD	102	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	87.7	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	82.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	90.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	92.1	23 - 140	
	13C-OCDD	84.2	17 - 157	
	13C-2,3,7,8-TCDF	98.1 ~~91.9~~	24 - 169	
	13C-1,2,3,7,8-PeCDF	97.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	96.3 ~~96.1~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	99.7	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	85.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	86.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	67.5 ~~90.8~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	89.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	97.4	26 - 138	
	13C-OCDF	84.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	104	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 1.11

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: MAS

Approved By: Calvin Tanaka 07-Mar-2012 10:40

This Page Intentionally Left Blank

Sample ID: A01-SD1-048-054

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-001	Date Received:	12-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	11-Jan-12	%Solids:	44.4	Date Analyzed DB-5:	12-Feb-12	Dates Analyzed SP-2331:	28-Feb-12
Time Collected:	1435						

5/18/12 J49

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	27100 J			D,E
1,2,3,7,8-PeCDD	54.8			
1,2,3,4,7,8-HxCDD	25.1			
1,2,3,6,7,8-HxCDD	181			
1,2,3,7,8,9-HxCDD	70.1			
1,2,3,4,6,7,8-HpCDD	2230			
OCDD	27500			B,D
2,3,7,8-TCDF	138			
1,2,3,7,8-PeCDF	62.8			
2,3,4,7,8-PeCDF	~~162~~ 289			
1,2,3,4,7,8-HxCDF	907			
1,2,3,6,7,8-HxCDF	210			
2,3,4,6,7,8-HxCDF	94.7			
1,2,3,7,8,9-HxCDF	~~41.7~~ 178			
1,2,3,4,6,7,8-HpCDF	3770			
1,2,3,4,7,8,9-HpCDF	158			
OCDF	7060			

M

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	107	25 - 164	D
	13C-1,2,3,7,8-PeCDD	109	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	94.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	86.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	93.3	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	100	23 - 140	
	13C-OCDD	88.6	17 - 157	D
	13C-2,3,7,8-TCDF	101	24 - 169	
	13C-1,2,3,7,8-PeCDF	103	24 - 185	
	13C-2,3,4,7,8-PeCDF	103 ~~94.0~~ ~~103~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	104 ~~102~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	90.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	97.2 ~~94.4~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	76.2 ~~97.9~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	101	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	107	26 - 138	
	13C-OCDF	98.3	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	240	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 27400

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Martha M. Maier 08-Mar-2012 09:07

Sample ID: A01-SD1-054-060 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-002	Date Received:	12-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	11-Jan-12	%Solids:	43.3	Date Analyzed DB-5:	13-Feb-12	Dates Analyzed SP-2331:	28-Feb-12
Time Collected:	1445						

5/18/12 DM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	16400			D
1,2,3,7,8-PeCDD	49.0			
1,2,3,4,7,8-HxCDD	27.5			
1,2,3,6,7,8-HxCDD	184			
1,2,3,7,8,9-HxCDD	75.9			
1,2,3,4,6,7,8-HpCDD	3360			
OCDD	56900			B,D
2,3,7,8-TCDF	128			
1,2,3,7,8-PeCDF	61.1			
2,3,4,7,8-PeCDF	139			
1,2,3,4,7,8-HxCDF	729			
1,2,3,6,7,8-HxCDF	172			
2,3,4,6,7,8-HxCDF	96.0			
1,2,3,7,8,9-HxCDF	128			
1,2,3,4,6,7,8-HpCDF	3170			
1,2,3,4,7,8,9-HpCDF	144			
OCDF	6280			

M

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	101	25 - 164	D
	13C-1,2,3,7,8-PeCDD	111	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	97.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	85.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	94.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	102	23 - 140	
	13C-OCDD	73.4	17 - 157	D
	13C-2,3,7,8-TCDF	101	24 - 169	
	13C-1,2,3,7,8-PeCDF	102	24 - 185	
	13C-2,3,4,7,8-PeCDF	99.9 ~~104~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	106	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	94.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	95.9 ~~96.1~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	93.9 ~~99.9~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	103	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	107	26 - 138	
	13C-OCDF	101	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	175	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **16700**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A01-SD1-060-066 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-003	Date Received:	12-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	11-Jan-12	%Solids:	53.7	Date Analyzed DB-5:	13-Feb-12	Dates Analyzed SP-2331:	28-Feb-12
Time Collected:	1444						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	8850			D
1,2,3,7,8-PeCDD	23.5			
1,2,3,4,7,8-HxCDD	12.3			
1,2,3,6,7,8-HxCDD	86.1			
1,2,3,7,8,9-HxCDD	38.7			
1,2,3,4,6,7,8-HpCDD	1370			
OCDD	14700			B,D
2,3,7,8-TCDF	330			
1,2,3,7,8-PeCDF	29.8			
2,3,4,7,8-PeCDF	77.2			
1,2,3,4,7,8-HxCDF	215			
1,2,3,6,7,8-HxCDF	70.4			
2,3,4,6,7,8-HxCDF	42.0			
1,2,3,7,8,9-HxCDF	43.4			
1,2,3,4,6,7,8-HpCDF	1280			
1,2,3,4,7,8,9-HpCDF	53.4			
OCDF	2840			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	109	25 - 164	D
	13C-1,2,3,7,8-PeCDD	107	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	97.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	85.5	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	96.3	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	97.0	23 - 140	
	13C-OCDD	79.9	17 - 157	D
	13C-2,3,7,8-TCDF	103	24 - 169	
	13C-1,2,3,7,8-PeCDF	105	24 - 185	
	13C-2,3,4,7,8-PeCDF	96.5 ~~104~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	105	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	91.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	91.3 ~~97.0~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	110 ~~105~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	101	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	107	26 - 138	
	13C-OCDF	94.1	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	138	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 9010

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: MAS

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A01-SD1-066-072 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-004	Date Received:	12-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	11-Jan-12	%Solids:	55.7	Date Analyzed DB-5:	13-Feb-12	Dates Analyzed SP-2331:	28-Feb-12
Time Collected:	1508						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	65.1 J			
1,2,3,7,8-PeCDD	3.96			G
1,2,3,4,7,8-HxCDD	3.20			G
1,2,3,6,7,8-HxCDD	19.2			
1,2,3,7,8,9-HxCDD	8.96			
1,2,3,4,6,7,8-HpCDD	339			
OCDD	5870			B
2,3,7,8-TCDF	22.0			
1,2,3,7,8-PeCDF	25.6			
2,3,4,7,8-PeCDF	28.1			
1,2,3,4,7,8-HxCDF	63.9			
1,2,3,6,7,8-HxCDF	87.4			
2,3,4,6,7,8-HxCDF	37.4			
1,2,3,7,8,9-HxCDF	36.3			
1,2,3,4,6,7,8-HpCDF	467			
1,2,3,4,7,8,9-HpCDF	105			
OCDF	880			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	118	25 - 164	
	13C-1,2,3,7,8-PeCDD	120	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	106	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	94.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	113	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	104	23 - 140	
	13C-OCDD	99.7	17 - 157	
	13C-2,3,7,8-TCDF	113	24 - 169	
	13C-1,2,3,7,8-PeCDF	114	24 - 185	
	13C-2,3,4,7,8-PeCDF	84.8 ~~115~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	116	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	104	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	92.2 ~~105~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	77.4 ~~116~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	108	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	115	26 - 138	
	13C-OCDF	100	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 117

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: MAS

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A01-SD1-072-078 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc. 5/18/12	Matrix:	Sediment	Lab Sample:	33543-005	Date Received:	12-Jan-12
Project:	FSI004	Sample Size:	10.0 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	11-Jan-12	%Solids:	64.1	Date Analyzed DB-5:	16-Feb-12	Dates Analyzed SP-2331:	29-Feb-12
Time Collected:	1522						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	6.75 EMPC			
1,2,3,7,8-PeCDD	1.62			G
1,2,3,4,7,8-HxCDD	ND		0.787	
1,2,3,6,7,8-HxCDD	3.32			G
1,2,3,7,8,9-HxCDD	1.66			G
1,2,3,4,6,7,8-HpCDD	42.5			
OCDD	1670			B
2,3,7,8-TCDF	8.55			
1,2,3,7,8-PeCDF	9.17			
2,3,4,7,8-PeCDF	~~6.75~~ ~~11.3~~ 6.75			
1,2,3,4,7,8-HxCDF	18.2			
1,2,3,6,7,8-HxCDF	23.2			
2,3,4,6,7,8-HxCDF	~~6.15~~ ~~14.6~~ 6.15			
1,2,3,7,8,9-HxCDF	~~6.04~~ 5.72			
1,2,3,4,6,7,8-HpCDF	82.0			
1,2,3,4,7,8,9-HpCDF	17.7			
OCDF	107			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	105	25 - 164	
	13C-1,2,3,7,8-PeCDD	111	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	103	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	94.8	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	103	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	101	23 - 140	
	13C-OCDD	96.3	17 - 157	
	13C-2,3,7,8-TCDF	103	24 - 169	
	13C-1,2,3,7,8-PeCDF	108	24 - 185	
	13C-2,3,4,7,8-PeCDF	103 ~~107~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	111	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	97.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	121 ~~98.7~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	102 ~~102~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	100	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	110	26 - 138	
	13C-OCDF	97.0	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	99.0	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 19.3

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: MAS

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A01-SD1-078-084 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-006	Date Received:	12-Jan-12
Project:	FSI004	Sample Size:	10.0 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	11-Jan-12	%Solids:	75.1	Date Analyzed DB-5:	17-Feb-12	Dates Analyzed SP-2331:	29-Feb-12
Time Collected:	1533						

5/18/12 AM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	5.69 EMPC			
1,2,3,7,8-PeCDD	ND	0.192		
1,2,3,4,7,8-HxCDD	ND	0.229		
1,2,3,6,7,8-HxCDD	0.480			G
1,2,3,7,8,9-HxCDD	0.287			G
1,2,3,4,6,7,8-HpCDD	6.04			
OCDD	216			B
2,3,7,8-TCDF	2.38			
1,2,3,7,8-PeCDF	1.36			G
2,3,4,7,8-PeCDF	1.42			G
1,2,3,4,7,8-HxCDF	1.99			G
1,2,3,6,7,8-HxCDF	1.08			G
2,3,4,6,7,8-HxCDF	0.817			G
1,2,3,7,8,9-HxCDF	~~0.498~~ ND	0.866		~~G~~
1,2,3,4,6,7,8-HpCDF	5.20			
1,2,3,4,7,8,9-HpCDF	1.16			G
OCDF	17.1			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	99.6	25 - 164	
	13C-1,2,3,7,8-PeCDD	106	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	100	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	91.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	94.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	93.2	23 - 140	
	13C-OCDD	80.8	17 - 157	
	13C-2,3,7,8-TCDF	98.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	101	24 - 185	
	13C-2,3,4,7,8-PeCDF	102	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	103	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	91.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	95.8	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	66.7 ~~97.3~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	94.7	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	101	26 - 138	
	13C-OCDF	83.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	97.1	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 7.10

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A02-SD1-000-006 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-008	Date Received:	13-Jan-12
Project:	FSI004	Sample Size:	10.0 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	37.9	Date Analyzed DB-5:	16-Feb-12	Dates Analyzed SP-2331:	28-Feb-12
Time Collected:	0705						

5/18/12 JM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	15900 M			D
1,2,3,7,8-PeCDD	35.5			
1,2,3,4,7,8-HxCDD	17.9			
1,2,3,6,7,8-HxCDD	112			
1,2,3,7,8,9-HxCDD	46.5			
1,2,3,4,6,7,8-HpCDD	1720			
OCDD	27000			B,D
2,3,7,8-TCDF	92.3			
1,2,3,7,8-PeCDF	33.9			
2,3,4,7,8-PeCDF	88.5			
1,2,3,4,7,8-HxCDF	477			
1,2,3,6,7,8-HxCDF	~~130~~ 125			
2,3,4,6,7,8-HxCDF	51.9			
1,2,3,7,8,9-HxCDF	~~86.8~~ 28.2 M			
1,2,3,4,6,7,8-HpCDF	1850			
1,2,3,4,7,8,9-HpCDF	81.6			
OCDF	3590			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	108	25 - 164	D
	13C-1,2,3,7,8-PeCDD	106	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	102	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	99.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	101	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	107	23 - 140	
	13C-OCDD	77.7	17 - 157	D
	13C-2,3,7,8-TCDF	102	24 - 169	
	13C-1,2,3,7,8-PeCDF	103	24 - 185	
	13C-2,3,4,7,8-PeCDF	96.6 ~~104~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	107	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	102 ~~97.3~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	93.6 ~~99.0~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	102	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	103	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	107	26 - 138	
	13C-OCDF	101	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	168	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 16100

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A02-SD1-006-012 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-009	Date Received:	13-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	52.1	Date Analyzed DB-5:	17-Feb-12	Dates Analyzed SP-2331:	28-Feb-12
Time Collected:	0720						

5/18/12 dm

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	9600			D
1,2,3,7,8-PeCDD	80.1			
1,2,3,4,7,8-HxCDD	14.6			
1,2,3,6,7,8-HxCDD	92.7			
1,2,3,7,8,9-HxCDD	41.4			
1,2,3,4,6,7,8-HpCDD	1420			
OCDD	15300			B,D
2,3,7,8-TCDF	384			
1,2,3,7,8-PeCDF	25.1			
2,3,4,7,8-PeCDF	77.7			
1,2,3,4,7,8-HxCDF	244			
1,2,3,6,7,8-HxCDF	76.6			
2,3,4,6,7,8-HxCDF	41.4			
1,2,3,7,8,9-HxCDF	~~57.8~~ 18.7			
1,2,3,4,6,7,8-HpCDF	1330			
1,2,3,4,7,8,9-HpCDF	60.7			
OCDF	2910			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	97.3	25 - 164	D
	13C-1,2,3,7,8-PeCDD	98.7	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	94.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	89.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	93.4	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	96.1	23 - 140	
	13C-OCDD	76.2	17 - 157	D
	13C-2,3,7,8-TCDF	94.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	93.5	24 - 185	
	13C-2,3,4,7,8-PeCDF	78.9 ~~93.3~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	96.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	93.2	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	93.5 ~~89.3~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	94.6	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	95.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	96.4	26 - 138	
	13C-OCDF	90.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	139	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 9830

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A02-SD1-012-018

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc. 5/18/12 dm	Matrix:	Sediment	Lab Sample:	33543-010	Date Received:	13-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	71.4	Date Analyzed DB-5:	17-Feb-12	Dates Analyzed SP-2331:	28-Feb-12
Time Collected:	0734						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	248			
1,2,3,7,8-PeCDD	1.33			G
1,2,3,4,7,8-HxCDD	0.717			G
1,2,3,6,7,8-HxCDD	4.06			
1,2,3,7,8,9-HxCDD	2.09			G
1,2,3,4,6,7,8-HpCDD	67.5			
OCDD	1520			B
2,3,7,8-TCDF	~~30.2~~ 27.9			
1,2,3,7,8-PeCDF	3.31			G
2,3,4,7,8-PeCDF	4.91			
1,2,3,4,7,8-HxCDF	16.9			
1,2,3,6,7,8-HxCDF	5.50			
2,3,4,6,7,8-HxCDF	2.86			G
1,2,3,7,8,9-HxCDF	~~2.09~~ 4.07			G
1,2,3,4,6,7,8-HpCDF	57.3			
1,2,3,4,7,8,9-HpCDF	5.73			
OCDF	125			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	83.7	25 - 164	
	13C-1,2,3,7,8-PeCDD	85.4	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	84.7	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	83.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	91.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	81.2	23 - 140	
	13C-OCDD	74.1	17 - 157	
	13C-2,3,7,8-TCDF	91.0 ~~83.8~~	24 - 169	
	13C-1,2,3,7,8-PeCDF	83.2	24 - 185	
	13C-2,3,4,7,8-PeCDF	92.5 ~~84.0~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	88.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	81.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	82.1 ~~82.4~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	69.8 ~~86.2~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	81.2	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	86.6	26 - 138	
	13C-OCDF	74.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	88.7	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 259

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: **A02-SD1-018-024** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-011	Date Received:	13-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	75.2	Date Analyzed DB-5:	17-Feb-12	Dates Analyzed SP-2331:	28-Feb-12
Time Collected:	0744						

5/18/12 DLW

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	26.9 EMPC			
1,2,3,7,8-PeCDD	0.549			G
1,2,3,4,7,8-HxCDD	0.169			G
1,2,3,6,7,8-HxCDD	ND		0.456	
1,2,3,7,8,9-HxCDD	0.331			G
1,2,3,4,6,7,8-HpCDD	6.97			
OCDD	237			B
2,3,7,8-TCDF	~~6.08~~ 6.05			
1,2,3,7,8-PeCDF	1.77			G
2,3,4,7,8-PeCDF	~~2.12~~ 1.47			G
1,2,3,4,7,8-HxCDF	2.61			G
1,2,3,6,7,8-HxCDF	0.976			G
2,3,4,6,7,8-HxCDF	~~0.810~~ 0.732			G
1,2,3,7,8,9-HxCDF	~~0.579~~ 0.484			G
1,2,3,4,6,7,8-HpCDF	5.03			
1,2,3,4,7,8,9-HpCDF	0.782			G
OCDF	20.0			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	103	25 - 164	
	13C-1,2,3,7,8-PeCDD	109	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	106	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	101	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	106	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	102	23 - 140	
	13C-OCDD	86.0	17 - 157	
	13C-2,3,7,8-TCDF	105 ~~102~~	24 - 169	
	13C-1,2,3,7,8-PeCDF	103	24 - 185	
	13C-2,3,4,7,8-PeCDF	103 ~~104~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	106	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	97.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	101 ~~102~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	85.1 ~~104~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	98.5	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	105	26 - 138	
	13C-OCDF	88.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 29.5

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A02-SD1-024-030 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc. 5/18/12 JM	Matrix:	Sediment	Lab Sample:	33543-012	Date Received:	13-Jan-12
Project:	FSI004	Sample Size:	10.0 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	66.9	Date Analyzed DB-5:	17-Feb-12	Dates Analyzed SP-2331:	29-Feb-12
Time Collected:	0757						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	15.2 EMPC			
1,2,3,7,8-PeCDD	ND		0.202	
1,2,3,4,7,8-HxCDD	ND	0.207		
1,2,3,6,7,8-HxCDD	0.665			G
1,2,3,7,8,9-HxCDD	0.611			G
1,2,3,4,6,7,8-HpCDD	21.8			
OCDD	1130			B
2,3,7,8-TCDF	3.31			
1,2,3,7,8-PeCDF	0.683			G
2,3,4,7,8-PeCDF	~~1.02~~ 0.769			G
1,2,3,4,7,8-HxCDF	1.65			G
1,2,3,6,7,8-HxCDF	~~0.705~~ 0.652			G
2,3,4,6,7,8-HxCDF	0.566			G
1,2,3,7,8,9-HxCDF	0.278			G
1,2,3,4,6,7,8-HpCDF	5.32			
1,2,3,4,7,8,9-HpCDF	0.549			G
OCDF	12.5			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	92.3	25 - 164	
	13C-1,2,3,7,8-PeCDD	94.3	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	93.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	94.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	93.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	88.6	23 - 140	
	13C-OCDD	79.6	17 - 157	
	13C-2,3,7,8-TCDF	91.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	92.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	88.2 ~~95.3~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	98.2	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	93.3 ~~89.8~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	92.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	94.7	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	90.7	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	93.3	26 - 138	
	13C-OCDF	81.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	94.2	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 16.9

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: **A02-SD1-030-036** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-013	Date Received:	13-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	83.4	Date Analyzed DB-5:	17-Feb-12	Date Analyzed DB-225:	NA
Time Collected:	0838						

5/18/12 dm

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	8.38 EMPC			
1,2,3,7,8-PeCDD	ND	0.169		
1,2,3,4,7,8-HxCDD	ND	0.133		
1,2,3,6,7,8-HxCDD	ND	0.154		
1,2,3,7,8,9-HxCDD	ND	0.162		
1,2,3,4,6,7,8-HpCDD	2.93			G
OCDD	66.5			B
2,3,7,8-TCDF	ND		0.210	
1,2,3,7,8-PeCDF	0.0749			G
2,3,4,7,8-PeCDF	ND		0.167	
1,2,3,4,7,8-HxCDF	0.445			G
1,2,3,6,7,8-HxCDF	0.166			G
2,3,4,6,7,8-HxCDF	0.122			G
1,2,3,7,8,9-HxCDF	ND	0.167		
1,2,3,4,6,7,8-HpCDF	2.03			G
1,2,3,4,7,8,9-HpCDF	ND	0.145		
OCDF	11.0			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	106	25 - 164	
	13C-1,2,3,7,8-PeCDD	108	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	103	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	104	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	105	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	98.5	23 - 140	
	13C-OCDD	82.9	17 - 157	
	13C-2,3,7,8-TCDF	102	24 - 169	
	13C-1,2,3,7,8-PeCDF	104	24 - 185	
	13C-2,3,4,7,8-PeCDF	106	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	108	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	103	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	103	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	104	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	98.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	102	26 - 138	
	13C-OCDF	88.5	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	88.9	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 8.53

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A02-SD1-036-042 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-014	Date Received:	13-Jan-12
Project:	FSI004	Sample Size:	10.0 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	85.0	Date Analyzed DB-5:	17-Feb-12	Date Analyzed DB-225:	NA
Time Collected:	0904						

5/18/12 JDS

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	9.63 EMPC			
1,2,3,7,8-PeCDD	ND	0.137		
1,2,3,4,7,8-HxCDD	ND	0.155		
1,2,3,6,7,8-HxCDD	0.153			G
1,2,3,7,8,9-HxCDD	ND	0.183		
1,2,3,4,6,7,8-HpCDD	2.77			G
OCDD	48.5			B
2,3,7,8-TCDF	0.341			G
1,2,3,7,8-PeCDF	ND	0.112		
2,3,4,7,8-PeCDF	0.231			G
1,2,3,4,7,8-HxCDF	0.486			G
1,2,3,6,7,8-HxCDF	0.145			G
2,3,4,6,7,8-HxCDF	0.103			G
1,2,3,7,8,9-HxCDF	ND	0.112		
1,2,3,4,6,7,8-HpCDF	1.99			G
1,2,3,4,7,8,9-HpCDF	ND	0.117		
OCDF	5.39			G

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	90.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	90.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	86.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	87.1	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	83.4	23 - 140	
	13C-OCDD	70.0	17 - 157	
	13C-2,3,7,8-TCDF	88.9	24 - 169	
	13C-1,2,3,7,8-PeCDF	88.7	24 - 185	
	13C-2,3,4,7,8-PeCDF	88.7	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	94.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	86.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	85.9	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	88.6	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	82.9	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	85.0	26 - 138	
	13C-OCDF	71.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	93.3	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 9.89

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: **A02-SD1-042-048** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-015	Date Received:	13-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	68.4	Date Analyzed DB-5:	17-Feb-12	Date Analyzed DB-225:	NA
Time Collected:	0920						

5/18/12 JM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	7.15 EMPC			
1,2,3,7,8-PeCDD	ND	0.134		
1,2,3,4,7,8-HxCDD	ND	0.162		
1,2,3,6,7,8-HxCDD	ND	0.185		
1,2,3,7,8,9-HxCDD	ND	0.202		
1,2,3,4,6,7,8-HpCDD	2.19			G
OCDD	45.0			B
2,3,7,8-TCDF	ND	0.138		
1,2,3,7,8-PeCDF	ND	0.0940		
2,3,4,7,8-PeCDF	0.143			G
1,2,3,4,7,8-HxCDF	0.288			G
1,2,3,6,7,8-HxCDF	0.0806			G
2,3,4,6,7,8-HxCDF	ND	0.110		
1,2,3,7,8,9-HxCDF	ND	0.144		
1,2,3,4,6,7,8-HpCDF	1.10			G
1,2,3,4,7,8,9-HpCDF	ND	0.129		
OCDF	3.83			G

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	96.0	25 - 164	
	13C-1,2,3,7,8-PeCDD	97.1	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	96.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	93.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	94.4	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	87.4	23 - 140	
	13C-OCDD	73.0	17 - 157	
	13C-2,3,7,8-TCDF	94.3	24 - 169	
	13C-1,2,3,7,8-PeCDF	94.2	24 - 185	
	13C-2,3,4,7,8-PeCDF	93.2	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	96.7	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	91.2	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	91.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	92.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	87.7	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	90.4	26 - 138	
	13C-OCDF	76.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	93.9	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 7.28

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A02-SD1-048-054 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-016	Date Received:	16-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	81.2	Date Analyzed DB-5:	17-Feb-12	Date Analyzed DB-225:	NA
Time Collected:	0930						

5/18/12 dm

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	4.13 EMPC			
1,2,3,7,8-PeCDD	ND	0.0968		
1,2,3,4,7,8-HxCDD	ND	0.149		
1,2,3,6,7,8-HxCDD	ND	0.171		
1,2,3,7,8,9-HxCDD	ND	0.177		
1,2,3,4,6,7,8-HpCDD	1.43			G
OCDD	22.3			B
2,3,7,8-TCDF	ND	0.131		
1,2,3,7,8-PeCDF	ND	0.0818		
2,3,4,7,8-PeCDF	0.115			G
1,2,3,4,7,8-HxCDF	0.193			G
1,2,3,6,7,8-HxCDF	0.0863			G
2,3,4,6,7,8-HxCDF	0.0708			G
1,2,3,7,8,9-HxCDF	ND	0.0947		
1,2,3,4,6,7,8-HpCDF	0.768			G
1,2,3,4,7,8,9-HpCDF	ND	0.0801		
OCDF	2.21			G

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	104	25 - 164	
	13C-1,2,3,7,8-PeCDD	104	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	103	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	102	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	101	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	95.9	23 - 140	
	13C-OCDD	77.9	17 - 157	
	13C-2,3,7,8-TCDF	99.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	101	24 - 185	
	13C-2,3,4,7,8-PeCDF	101	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	107	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	99.6	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	100	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	102	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	94.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	99.9	26 - 138	
	13C-OCDF	82.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	97.9	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 4.23

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A02-SD1-054-060

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-017	Date Received:	16-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	86.1	Date Analyzed DB-5:	17-Feb-12	Date Analyzed DB-225:	NA
Time Collected:	0950						

5/18/12

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	0.315 EMPC			G
1,2,3,7,8-PeCDD	ND	0.0936		
1,2,3,4,7,8-HxCDD	ND	0.203		
1,2,3,6,7,8-HxCDD	ND	0.225		
1,2,3,7,8,9-HxCDD	ND	0.237		
1,2,3,4,6,7,8-HpCDD	0.236			G
OCDD	4.95			G,B
2,3,7,8-TCDF	ND	0.0732		
1,2,3,7,8-PeCDF	ND	0.0510		
2,3,4,7,8-PeCDF	ND	0.0513		
1,2,3,4,7,8-HxCDF	ND	0.0544		
1,2,3,6,7,8-HxCDF	ND	0.0579		
2,3,4,6,7,8-HxCDF	ND	0.0630		
1,2,3,7,8,9-HxCDF	ND	0.0865		
1,2,3,4,6,7,8-HpCDF	ND		0.101	
1,2,3,4,7,8,9-HpCDF	ND	0.0978		
OCDF	0.426			G

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	101	25 - 164	
	13C-1,2,3,7,8-PeCDD	101	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	101	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	97.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	97.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	91.6	23 - 140	
	13C-OCDD	75.3	17 - 157	
	13C-2,3,7,8-TCDF	101	24 - 169	
	13C-1,2,3,7,8-PeCDF	97.2	24 - 185	
	13C-2,3,4,7,8-PeCDF	97.3	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	104	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	97.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	96.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	97.8	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	92.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	93.4	26 - 138	
	13C-OCDF	79.0	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	98.6	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 0.319

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: SD-00-A02-054

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-018	Date Received:	16-Jan-12
Project:	FSI004	Sample Size:	10.0 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	81.0	Date Analyzed DB-5:	17-Feb-12	Date Analyzed DB-225:	NA
Time Collected:	0000						

5/18/12 dmy

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	0.409 EMPC			G
1,2,3,7,8-PeCDD	ND	0.121		
1,2,3,4,7,8-HxCDD	ND	0.183		
1,2,3,6,7,8-HxCDD	ND	0.203		
1,2,3,7,8,9-HxCDD	ND	0.206		
1,2,3,4,6,7,8-HpCDD	0.527			G
OCDD	7.43			B
2,3,7,8-TCDF	ND	0.113		
1,2,3,7,8-PeCDF	ND	0.0776		
2,3,4,7,8-PeCDF	ND	0.0774		
1,2,3,4,7,8-HxCDF	ND	0.0974		
1,2,3,6,7,8-HxCDF	ND	0.0975		
2,3,4,6,7,8-HxCDF	ND	0.116		
1,2,3,7,8,9-HxCDF	ND	0.140		
1,2,3,4,6,7,8-HpCDF	0.290			G
1,2,3,4,7,8,9-HpCDF	ND	0.148		
OCDF	0.949			G

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	91.8	25 - 164	
	13C-1,2,3,7,8-PeCDD	97.6	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	95.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	87.7	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	93.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	90.1	23 - 140	
	13C-OCDD	80.2	17 - 157	
	13C-2,3,7,8-TCDF	92.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	93.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	94.2	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	96.7	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	86.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	91.1	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	93.9	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	88.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	97.5	26 - 138	
	13C-OCDF	82.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	100	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 0.420

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: A02-SD1-060-066

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-019	Date Received:	16-Jan-12
Project:	FSI004	Sample Size:	10.0 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	88.3	Date Analyzed DB-5:	17-Feb-12	Date Analyzed DB-225:	NA
Time Collected:	1000						

5/18/12 dm

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	0.363 EMPC			G
1,2,3,7,8-PeCDD	ND	0.108		
1,2,3,4,7,8-HxCDD	ND	0.157		
1,2,3,6,7,8-HxCDD	ND	0.172		
1,2,3,7,8,9-HxCDD	ND	0.177		
1,2,3,4,6,7,8-HpCDD	ND	0.155		
OCDD	3.62			G,B
2,3,7,8-TCDF	ND	0.0799		
1,2,3,7,8-PeCDF	ND	0.0536		
2,3,4,7,8-PeCDF	ND	0.0520		
1,2,3,4,7,8-HxCDF	ND	0.0572		
1,2,3,6,7,8-HxCDF	ND	0.0609		
2,3,4,6,7,8-HxCDF	ND	0.0720		
1,2,3,7,8,9-HxCDF	ND	0.0934		
1,2,3,4,6,7,8-HpCDF	0.189			G
1,2,3,4,7,8,9-HpCDF	ND	0.0881		
OCDF	0.739			G

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	87.6	25 - 164	
	13C-1,2,3,7,8-PeCDD	89.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	85.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	80.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	82.1	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	78.1	23 - 140	
	13C-OCDD	67.0	17 - 157	
	13C-2,3,7,8-TCDF	85.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	87.0	24 - 185	
	13C-2,3,4,7,8-PeCDF	88.4	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	93.9	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	80.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	83.4	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	83.9	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	80.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	83.4	26 - 138	
	13C-OCDF	69.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	84.5	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 0.366

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

Sample ID: **A02-SD1-066-072** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33543-020	Date Received:	16-Jan-12
Project:	FSI004	Sample Size:	10.1 g	QC Batch No.:	4244	Date Extracted:	30-Jan-12
Date Collected:	12-Jan-12	%Solids:	90.1	Date Analyzed DB-5:	19-Feb-12	Date Analyzed DB-225:	NA
Time Collected:	1010						

5/18/12 dm

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND		0.231	
1,2,3,7,8-PeCDD	ND	0.116		
1,2,3,4,7,8-HxCDD	ND	0.298		
1,2,3,6,7,8-HxCDD	ND	0.343		
1,2,3,7,8,9-HxCDD	ND	0.324		
1,2,3,4,6,7,8-HpCDD	ND	0.259		
OCDD	2.65			G,B
2,3,7,8-TCDF	ND	0.0750		
1,2,3,7,8-PeCDF	ND	0.0830		
2,3,4,7,8-PeCDF	ND	0.0891		
1,2,3,4,7,8-HxCDF	ND	0.133		
1,2,3,6,7,8-HxCDF	ND	0.135		
2,3,4,6,7,8-HxCDF	ND	0.148		
1,2,3,7,8,9-HxCDF	ND	0.196		
1,2,3,4,6,7,8-HpCDF	0.509			G
1,2,3,4,7,8,9-HpCDF	ND	0.132		
OCDF	2.28			G

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	102	25 - 164	
	13C-1,2,3,7,8-PeCDD	102	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	107	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	94.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	101	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	92.7	23 - 140	
	13C-OCDD	82.5	17 - 157	
	13C-2,3,7,8-TCDF	101	24 - 169	
	13C-1,2,3,7,8-PeCDF	99.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	101	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	104	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	94.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	98.1	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	99.5	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	93.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	103	26 - 138	
	13C-OCDF	84.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **0.00657**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 07-Mar-2012 13:25

This Page Intentionally Left Blank

Sample ID: A03-SD1-000-006 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-001	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	44.1	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1211						

5/13/12 DM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	2070 M			D
1,2,3,7,8-PeCDD	30.8			
1,2,3,4,7,8-HxCDD	16.0			
1,2,3,6,7,8-HxCDD	119			
1,2,3,7,8,9-HxCDD	52.8			
1,2,3,4,6,7,8-HpCDD	1670			
OCDD	21200			D
2,3,7,8-TCDF	72.7			
1,2,3,7,8-PeCDF	25.8			
2,3,4,7,8-PeCDF	50.5			
1,2,3,4,7,8-HxCDF	182			
1,2,3,6,7,8-HxCDF	64.2			
2,3,4,6,7,8-HxCDF	31.1			
1,2,3,7,8,9-HxCDF	28.8			
1,2,3,4,6,7,8-HpCDF	896			
1,2,3,4,7,8,9-HpCDF	53.8			
OCDF	2480			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	83.7	25 - 164	D
	13C-1,2,3,7,8-PeCDD	82.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	83.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	81.7	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	80.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	78.9	23 - 140	
	13C-OCDD	69.4	17 - 157	D
	13C-2,3,7,8-TCDF	82.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	76.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	78.3 ~~75.5~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	81.6	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	76.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	148 ~~77.5~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	62.2	78.2 29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	74.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	72.9	26 - 138	
	13C-OCDF	59.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **2210**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-006-012

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-002	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	59.7	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1222						

5/18/12 DM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	1440			D
1,2,3,7,8-PeCDD	11.6			
1,2,3,4,7,8-HxCDD	9.01			
1,2,3,6,7,8-HxCDD	57.7			
1,2,3,7,8,9-HxCDD	24.2			
1,2,3,4,6,7,8-HpCDD	1450			
OCDD	19700			D
2,3,7,8-TCDF	42.0			
1,2,3,7,8-PeCDF	14.2			
2,3,4,7,8-PeCDF	32.2			
1,2,3,4,7,8-HxCDF	141			
1,2,3,6,7,8-HxCDF	45.2			
2,3,4,6,7,8-HxCDF	~~20.7~~ 37.6			
1,2,3,7,8,9-HxCDF	20.2			
1,2,3,4,6,7,8-HpCDF	678			
1,2,3,4,7,8,9-HpCDF	37.0			
OCDF	1530		EMPC	

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	81.4	25 - 164	D
	13C-1,2,3,7,8-PeCDD	80.0	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	82.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	81.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	82.4	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	74.9	23 - 140	
	13C-OCDD	73.6	17 - 157	D
	13C-2,3,7,8-TCDF	78.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	77.3	24 - 185	
	13C-2,3,4,7,8-PeCDF ~~77.7~~	~~76.7~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	81.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	75.2	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	74.8	28 - 136	
	13C-1,2,3,7,8,9-HxCDF 65.8	~~76.1~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	72.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	70.6	26 - 138	
	13C-OCDF	57.1	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	103	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 1530

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-012-018 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-003	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.1 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	44.3	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1236						

5/18/12 dm

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	5930 M			D
1,2,3,7,8-PeCDD	34.0			
1,2,3,4,7,8-HxCDD	24.9			
1,2,3,6,7,8-HxCDD	134			
1,2,3,7,8,9-HxCDD	61.5			
1,2,3,4,6,7,8-HpCDD	3150			
OCDD	56900			D
2,3,7,8-TCDF	96.8			
1,2,3,7,8-PeCDF	49.7			
2,3,4,7,8-PeCDF	129			
1,2,3,4,7,8-HxCDF	715			
1,2,3,6,7,8-HxCDF	~~199~~ 189			
2,3,4,6,7,8-HxCDF	98.6			
1,2,3,7,8,9-HxCDF	163			
1,2,3,4,6,7,8-HpCDF	4080			
1,2,3,4,7,8,9-HpCDF	190			
OCDF	7390			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	91.8	25 - 164	D
	13C-1,2,3,7,8-PeCDD	87.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	91.9	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	90.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	90.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	86.6	23 - 140	
	13C-OCDD	72.4	17 - 157	D
	13C-2,3,7,8-TCDF	86.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	81.2	24 - 185	
	13C-2,3,4,7,8-PeCDF 86.3	~~80.1~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	91.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF 83.4	~~83.7~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF 78.6	~~84.0~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF 84.3	~~83.4~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	83.7	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	80.0	26 - 138	
	13C-OCDF	68.1	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	117	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 6250

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-018-024 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-004	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	38.0	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1240						

5/18/12 dd

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	9330			D
1,2,3,7,8-PeCDD	38.3			
1,2,3,4,7,8-HxCDD	26.3			
1,2,3,6,7,8-HxCDD	159			
1,2,3,7,8,9-HxCDD	69.8			
1,2,3,4,6,7,8-HpCDD	3390			
OCDD	54800			D
2,3,7,8-TCDF	~~132~~ 129			
1,2,3,7,8-PeCDF	49.1			
2,3,4,7,8-PeCDF	118			
1,2,3,4,7,8-HxCDF	~~604~~ 588			
1,2,3,6,7,8-HxCDF	~~154~~ 139			
2,3,4,6,7,8-HxCDF	69.1			
1,2,3,7,8,9-HxCDF	120			
1,2,3,4,6,7,8-HpCDF	2910			
1,2,3,4,7,8,9-HpCDF	113			
OCDF	6650			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	89.5	25 - 164	D
	13C-1,2,3,7,8-PeCDD	89.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	87.6	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	85.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	88.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	81.9	23 - 140	
	13C-OCDD	74.1	17 - 157	D
	13C-2,3,7,8-TCDF 90.7	~~87.5~~	24 - 169	
	13C-1,2,3,7,8-PeCDF	84.6	24 - 185	
	13C-2,3,4,7,8-PeCDF 92.6	~~83.4~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF 87.8	~~86.5~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF 85.6	~~81.1~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF 80.8	~~81.4~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF 82.2	~~83.5~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	77.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	76.3	26 - 138	
	13C-OCDF	61.1	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	127	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 9620

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-024-030

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-005	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	41.3	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1252						

5/18/12 (DM)

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	10400			D
1,2,3,7,8-PeCDD	42.3			
1,2,3,4,7,8-HxCDD	27.0			
1,2,3,6,7,8-HxCDD	161			
1,2,3,7,8,9-HxCDD	74.3			
1,2,3,4,6,7,8-HpCDD	3150			
OCDD	51200			D
2,3,7,8-TCDF	133			
1,2,3,7,8-PeCDF	51.8			
2,3,4,7,8-PeCDF	128			
1,2,3,4,7,8-HxCDF	~~529~~ 522			
1,2,3,6,7,8-HxCDF	~~148~~ 137			
2,3,4,6,7,8-HxCDF	70.1			
1,2,3,7,8,9-HxCDF	89.8			
1,2,3,4,6,7,8-HpCDF	2300			
1,2,3,4,7,8,9-HpCDF	103			
OCDF	4680			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	90.5	25 - 164	D
	13C-1,2,3,7,8-PeCDD	86.0	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	89.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	85.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	89.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	84.0	23 - 140	
	13C-OCDD	76.8	17 - 157	D
	13C-2,3,7,8-TCDF	85.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	82.1	24 - 185	
	13C-2,3,4,7,8-PeCDF	86.5 ~~79.8~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	88.6 ~~88.9~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	85.7 ~~81.1~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	~~79.7~~ ~~81.5~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	84.9 ~~82.2~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	78.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	76.1	26 - 138	
	13C-OCDF	60.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	134	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **10700**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: SD-00-A03-024 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-006	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	41.7	Date Analyzed DB-5:	14-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	0000						

5/18/12 dm

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	9350 M			D
1,2,3,7,8-PeCDD	50.4			
1,2,3,4,7,8-HxCDD	27.8			
1,2,3,6,7,8-HxCDD	162			
1,2,3,7,8,9-HxCDD	75.7			
1,2,3,4,6,7,8-HpCDD	3610			
OCDD	63300			D
2,3,7,8-TCDF	126			
1,2,3,7,8-PeCDF	62.7			
2,3,4,7,8-PeCDF	129			
1,2,3,4,7,8-HxCDF	~~629~~ 614			
1,2,3,6,7,8-HxCDF	~~166~~ 149			
2,3,4,6,7,8-HxCDF	69.4			
1,2,3,7,8,9-HxCDF	78.9			
1,2,3,4,6,7,8-HpCDF	2500			
1,2,3,4,7,8,9-HpCDF	112			
OCDF	5080			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	89.0	25 - 164	D
	13C-1,2,3,7,8-PeCDD	90.1	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	89.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	89.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	87.7	23 - 140	
	13C-OCDD	76.5	17 - 157	D
	13C-2,3,7,8-TCDF	88.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	85.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	88.5 ~~83.4~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	109 ~~90.6~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	112 ~~84.7~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	112 ~~84.2~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	92.5 ~~86.2~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	83.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	79.8	26 - 138	
	13C-OCDF	65.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	136	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 9660

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-030-036

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-007	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	41.6	Date Analyzed DB-5:	12-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1305						

5/18/12 AM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	18600	M		D
1,2,3,7,8-PeCDD	69.7			
1,2,3,4,7,8-HxCDD	32.2			
1,2,3,6,7,8-HxCDD	221			
1,2,3,7,8,9-HxCDD	90.8			
1,2,3,4,6,7,8-HpCDD	3840			
OCDD	60900			D
2,3,7,8-TCDF	140			
1,2,3,7,8-PeCDF	70.3			
2,3,4,7,8-PeCDF	174			
1,2,3,4,7,8-HxCDF	881			
1,2,3,6,7,8-HxCDF	207			
2,3,4,6,7,8-HxCDF	~~93.2~~ 159	M	EMPC	
1,2,3,7,8,9-HxCDF	~~61.4~~ 45.3	M		
1,2,3,4,6,7,8-HpCDF	3420			
1,2,3,4,7,8,9-HpCDF	144			
OCDF	7150			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	89.7	25 - 164	D
	13C-1,2,3,7,8-PeCDD	89.7	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	84.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	73.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	81.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	83.8	23 - 140	
	13C-OCDD	78.7	17 - 157	D
	13C-2,3,7,8-TCDF	87.3	24 - 169	
	13C-1,2,3,7,8-PeCDF	85.8	24 - 185	
	13C-2,3,4,7,8-PeCDF	84.1 ~~85.5~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	84.9	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	77.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	81.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	84.8	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	83.3	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	88.8	26 - 138	
	13C-OCDF	81.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	155	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **19000**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-036-042 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-009	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.1 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	42.4	Date Analyzed DB-5:	12-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1320						

5/18/12 JM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	19100 J			D,E
1,2,3,7,8-PeCDD	62.5 M			
1,2,3,4,7,8-HxCDD	31.1			
1,2,3,6,7,8-HxCDD	214			
1,2,3,7,8,9-HxCDD	96.1			
1,2,3,4,6,7,8-HpCDD	3370			
OCDD	48600			D
2,3,7,8-TCDF	132			
1,2,3,7,8-PeCDF	69.9			
2,3,4,7,8-PeCDF	176			
1,2,3,4,7,8-HxCDF	917			
1,2,3,6,7,8-HxCDF	208			
2,3,4,6,7,8-HxCDF	~~98.6~~ 157			
1,2,3,7,8,9-HxCDF	46.1			
1,2,3,4,6,7,8-HpCDF	3910			
1,2,3,4,7,8,9-HpCDF	159			
OCDF	8200			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	86.5	25 - 164	D
	13C-1,2,3,7,8-PeCDD	94.4	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	84.4	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	77.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	85.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	85.2	23 - 140	
	13C-OCDD	79.6	17 - 157	D
	13C-2,3,7,8-TCDF	87.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	87.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	85.0 ~~87.3~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	88.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	79.6	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	84.2	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	100 ~~89.0~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	85.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	89.1	26 - 138	
	13C-OCDF	80.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	173	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 19500

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-042-048 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-010	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.1 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	42.1	Date Analyzed DB-5:	12-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1339						

5/18/12 dtj

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	17500 M			D
1,2,3,7,8-PeCDD	61.6			
1,2,3,4,7,8-HxCDD	30.8			
1,2,3,6,7,8-HxCDD	207			
1,2,3,7,8,9-HxCDD	90.9			
1,2,3,4,6,7,8-HpCDD	3190			
OCDD	44800			D
2,3,7,8-TCDF	149			
1,2,3,7,8-PeCDF	72.9			
2,3,4,7,8-PeCDF	173			
1,2,3,4,7,8-HxCDF	~~986~~ 985			
1,2,3,6,7,8-HxCDF	222			
2,3,4,6,7,8-HxCDF	~~95.3~~ 163			
1,2,3,7,8,9-HxCDF	41.6			
1,2,3,4,6,7,8-HpCDF	4160			
1,2,3,4,7,8,9-HpCDF	167			
OCDF	8970			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	85.9	25 - 164	D
	13C-1,2,3,7,8-PeCDD	97.6	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	87.9	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	77.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	85.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	88.0	23 - 140	
	13C-OCDD	84.1	17 - 157	D
	13C-2,3,7,8-TCDF	91.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	93.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	86 ~~90.7~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	89.2	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	77.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	83.2	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	113 ~~90.9~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	87.5	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	91.1	26 - 138	
	13C-OCDF	85.3	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	166	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **17900**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-048-054

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-011	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	48.5	Date Analyzed DB-5:	12-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1439						

5/18/12 DM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	13000			D
1,2,3,7,8-PeCDD	44.6			
1,2,3,4,7,8-HxCDD	22.8			
1,2,3,6,7,8-HxCDD	150			
1,2,3,7,8,9-HxCDD	63.4			
1,2,3,4,6,7,8-HpCDD	2530			
OCDD	36800			D
2,3,7,8-TCDF	181			
1,2,3,7,8-PeCDF	46.4			
2,3,4,7,8-PeCDF	124			
1,2,3,4,7,8-HxCDF	~~663~~ 661			
1,2,3,6,7,8-HxCDF	~~153~~ 150			
2,3,4,6,7,8-HxCDF	88.2			
1,2,3,7,8,9-HxCDF	102			
1,2,3,4,6,7,8-HpCDF	2710			
1,2,3,4,7,8,9-HpCDF	116			
OCDF	5600			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	92.2	25 - 164	D
	13C-1,2,3,7,8-PeCDD	99.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	88.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	78.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	88.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	91.3	23 - 140	
	13C-OCDD	79.3	17 - 157	D
	13C-2,3,7,8-TCDF	89.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	93.0	24 - 185	
	13C-2,3,4,7,8-PeCDF	85.6 ~~92.2~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	95.7 ~~91.8~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	93.9 ~~81.2~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	85.0 ~~85.1~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	83.5 ~~94.1~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	89.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	96.4	26 - 138	
	13C-OCDF	87.5	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	161	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 13300

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 12-Mar-2012 11:16

Sample ID: **A03-SD1-054-060** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-012	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	61.3	Date Analyzed DB-5:	12-Feb-12	Dates Analyzed SP-2331:	27-Feb-12
Time Collected:	1457						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	808			D
1,2,3,7,8-PeCDD	19.5			
1,2,3,4,7,8-HxCDD	9.18			
1,2,3,6,7,8-HxCDD	54.6			
1,2,3,7,8,9-HxCDD	22.8			
1,2,3,4,6,7,8-HpCDD	1230			
OCDD	17600			D
2,3,7,8-TCDF	162			
1,2,3,7,8-PeCDF	14.2			
2,3,4,7,8-PeCDF	46.8			
1,2,3,4,7,8-HxCDF	156			
1,2,3,6,7,8-HxCDF	45.7			
2,3,4,6,7,8-HxCDF	31.0			
1,2,3,7,8,9-HxCDF	28.4			
1,2,3,4,6,7,8-HpCDF	628			
1,2,3,4,7,8,9-HpCDF	38.1			
OCDF	1440		EMPC	

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	90.0	25 - 164	D
	13C-1,2,3,7,8-PeCDD	98.3	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	88.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	77.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	90.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	89.8	23 - 140	
	13C-OCDD	74.7	17 - 157	D
	13C-2,3,7,8-TCDF	88.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	93.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	81.5	~~93.9~~ 21 - 178	
	13C-1,2,3,4,7,8-HxCDF	90.1	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	82.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	76.8	~~85.7~~ 28 - 136	
	13C-1,2,3,7,8,9-HxCDF	80.6	~~91.2~~ 29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	90.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	96.3	26 - 138	
	13C-OCDF	86.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	104	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **918**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-060-066 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-013	Date Received:	13-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	49.4	Date Analyzed DB-5:	12-Feb-12	Dates Analyzed SP-2331:	28-Feb-12
Time Collected:	1510						

5/18/12 JD

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	2950 M			D
1,2,3,7,8-PeCDD	49.6			
1,2,3,4,7,8-HxCDD	25.2			
1,2,3,6,7,8-HxCDD	142			
1,2,3,7,8,9-HxCDD	59.7			
1,2,3,4,6,7,8-HpCDD	2320			
OCDD	31400			D
2,3,7,8-TCDF	~~445~~ 424			
1,2,3,7,8-PeCDF	59.3 M			
2,3,4,7,8-PeCDF	216 JH			
1,2,3,4,7,8-HxCDF	~~1630~~ 1596			
1,2,3,6,7,8-HxCDF	~~304~~ 296			
2,3,4,6,7,8-HxCDF	112 JH			
1,2,3,7,8,9-HxCDF	236 JL			
1,2,3,4,6,7,8-HpCDF	5220 J			E
1,2,3,4,7,8,9-HpCDF	264 M			
OCDF	16600 M			D

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	89.9	25 - 164	D
	13C-1,2,3,7,8-PeCDD	103	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	88.9	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	78.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	87.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	93.5	23 - 140	
	13C-OCDD	65.7	17 - 157	D
	13C-2,3,7,8-TCDF	82.9 ~~91.4~~	24 - 169	
	13C-1,2,3,7,8-PeCDF	93.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	70.6 ~~93.4~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	91.3 ~~92.8~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	89.3 ~~83.1~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	79.8 ~~87.7~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	71.0 ~~93.5~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	93.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	98.3	26 - 138	
	13C-OCDF	71.4	17 - 157	D
CRS	37Cl-2,3,7,8-TCDD	111	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 3450

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-066-072

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-014	Date Received:	16-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	54.3	Date Analyzed DB-5:	12-Feb-12	Dates Analyzed SP-2331:	29-Feb-12
Time Collected:	1520						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	2370			D
1,2,3,7,8-PeCDD	41.6			
1,2,3,4,7,8-HxCDD	15.5			
1,2,3,6,7,8-HxCDD	102			
1,2,3,7,8,9-HxCDD	46.3			
1,2,3,4,6,7,8-HpCDD	1790			
OCDD	21800			D
2,3,7,8-TCDF	313			
1,2,3,7,8-PeCDF	22.6			
2,3,4,7,8-PeCDF	61.8			
1,2,3,4,7,8-HxCDF	~~217~~ 215			
1,2,3,6,7,8-HxCDF	64.4			
2,3,4,6,7,8-HxCDF	~~77.9~~ 75.2			
1,2,3,7,8,9-HxCDF	39.7			
1,2,3,4,6,7,8-HpCDF	1120			
1,2,3,4,7,8,9-HpCDF	58.4			
OCDF	4720			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	94.6	25 - 164	D
	13C-1,2,3,7,8-PeCDD	105	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	93.4	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	83.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	93.1	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	96.6	23 - 140	
	13C-OCDD	74.3	17 - 157	D
	13C-2,3,7,8-TCDF	94.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	99.2	24 - 185	
	13C-2,3,4,7,8-PeCDF	104 ~~97.9~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	109 ~~96.3~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	87.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	91.4	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	71.8 ~~95.8~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	96.5	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	102	26 - 138	
	13C-OCDF	92.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	116	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 2560

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-072-078

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-015	Date Received:	16-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	62.4	Date Analyzed DB-5:	12-Feb-12	Dates Analyzed SP-2331:	29-Feb-12
Time Collected:	1531						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	1170			D
1,2,3,7,8-PeCDD	22.6			
1,2,3,4,7,8-HxCDD	8.67			
1,2,3,6,7,8-HxCDD	58.1			
1,2,3,7,8,9-HxCDD	25.8			
1,2,3,4,6,7,8-HpCDD	1030			
OCDD	13000			D
2,3,7,8-TCDF	~~171~~ 169			
1,2,3,7,8-PeCDF	12.0			
2,3,4,7,8-PeCDF	31.6			
1,2,3,4,7,8-HxCDF	~~99.9~~ 99.1			
1,2,3,6,7,8-HxCDF	37.6			
2,3,4,6,7,8-HxCDF	39.4			
1,2,3,7,8,9-HxCDF	20.7			
1,2,3,4,6,7,8-HpCDF	612			
1,2,3,4,7,8,9-HpCDF	31.8			
OCDF	1320		EMPC	

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	91.4	25 - 164	D
	13C-1,2,3,7,8-PeCDD	102	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	91.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	80.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	89.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	92.6	23 - 140	
	13C-OCDD	69.1	17 - 157	D
	13C-2,3,7,8-TCDF	96.5 ~~92.8~~	24 - 169	
	13C-1,2,3,7,8-PeCDF	95.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	94.0 ~~95.6~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	110.0 ~~94.8~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	85.2	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	113 ~~89.0~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	66.8 ~~94.4~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	91.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	100	26 - 138	
	13C-OCDF	86.5	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	103	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 1270

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 12-Mar-2012 11:18

Sample ID: A03-SD1-078-084

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33545-016	Date Received:	16-Jan-12
Project:	FSI005	Sample Size:	10.0 g	QC Batch No.:	4246	Date Extracted:	1-Feb-12
Date Collected:	12-Jan-12	%Solids:	84.5	Date Analyzed DB-5:	12-Feb-12	Dates Analyzed SP-2331:	29-Feb-12
Time Collected:	1543						

5/18/12 AM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	17.8		EMPC	
1,2,3,7,8-PeCDD	0.733			G
1,2,3,4,7,8-HxCDD	0.493			G
1,2,3,6,7,8-HxCDD	2.94			G
1,2,3,7,8,9-HxCDD	1.43			G
1,2,3,4,6,7,8-HpCDD	45.2			
OCDD	489		EMPC	
2,3,7,8-TCDF	2.75			
1,2,3,7,8-PeCDF	1.00			G
2,3,4,7,8-PeCDF	2.63			G
1,2,3,4,7,8-HxCDF	4.00		EMPC	
1,2,3,6,7,8-HxCDF	3.24		EMPC	
2,3,4,6,7,8-HxCDF	~~9.65~~		4.68	
1,2,3,7,8,9-HxCDF	~~0.951~~		1.89	G
1,2,3,4,6,7,8-HpCDF	40.1		EMPC	
1,2,3,4,7,8,9-HpCDF	1.86			G
OCDF	56.3		EMPC	

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	99.8	25 - 164	
	13C-1,2,3,7,8-PeCDD	107	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	81.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	95.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	94.9	23 - 140	
	13C-OCDD	83.8	17 - 157	
	13C-2,3,7,8-TCDF	93.4	24 - 169	
	13C-1,2,3,7,8-PeCDF	100	24 - 185	
	13C-2,3,4,7,8-PeCDF	97.5 ~~97.9~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	99.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	88.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	91.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	68.8 ~~95.4~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	92.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	103	26 - 138	
	13C-OCDF	88.3	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	108	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 22.9

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 12-Mar-2012 11:18

This Page Intentionally Left Blank

Sample ID: C01-SD1-000-006

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33546-001	Date Received:	14-Jan-12
Project:	FSI006	Sample Size:	10.0 g	QC Batch No.:	4226	Date Extracted:	25-Jan-12
Date Collected:	13-Jan-12	%Solids:	35.0	Date Analyzed DB-5:	28-Jan-12	Dates Analyzed SP-2331:	25-Feb-12
Time Collected:	1314						

5/18/12 dm

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	863		EMPC	
1,2,3,7,8-PeCDD	11.2			
1,2,3,4,7,8-HxCDD	9.92			
1,2,3,6,7,8-HxCDD	51.1		M	
1,2,3,7,8,9-HxCDD	26.8			
1,2,3,4,6,7,8-HpCDD	879			
OCDD	10100			
2,3,7,8-TCDF	42.6			
1,2,3,7,8-PeCDF	24.9		EMPC	
2,3,4,7,8-PeCDF	54.8			
1,2,3,4,7,8-HxCDF	310			
1,2,3,6,7,8-HxCDF	~~86.1~~ 82.7		EMPC	
2,3,4,6,7,8-HxCDF	35.3			
1,2,3,7,8,9-HxCDF	53.5			
1,2,3,4,6,7,8-HpCDF	1250			
1,2,3,4,7,8,9-HpCDF	45.2			
OCDF	1820			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	97.7	25 - 164	
	13C-1,2,3,7,8-PeCDD	109	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	96.3	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	88.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	93.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	100	23 - 140	
	13C-OCDD	88.6	17 - 157	
	13C-2,3,7,8-TCDF	99.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	99.7	24 - 185	
	13C-2,3,4,7,8-PeCDF	102 ~~101~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	95.6	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	83.1 ~~86.8~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	87.1 ~~93.0~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	91.2 ~~94.3~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	98.2	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	102	26 - 138	
	13C-OCDF	89.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	110	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 978

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Rose Harrelson 08-Mar-2012 14:23

Sample ID: C01-SD1-006-012 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33546-002	Date Received:	14-Jan-12
Project:	FSI006	Sample Size:	10.1 g	QC Batch No.:	4226	Date Extracted:	25-Jan-12
Date Collected:	13-Jan-12	%Solids:	38.0	Date Analyzed DB-5:	28-Jan-12	Dates Analyzed SP-2331:	25-Feb-12
Time Collected:	1502						

5/18/12 JAD

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	1190	EMPC J		D
1,2,3,7,8-PeCDD	13.0	EMPC		
1,2,3,4,7,8-HxCDD	11.7	EMPC		
1,2,3,6,7,8-HxCDD	55.1	M		
1,2,3,7,8,9-HxCDD	30.6			
1,2,3,4,6,7,8-HpCDD	1030			
OCDD	12200			D
2,3,7,8-TCDF	44.2			
1,2,3,7,8-PeCDF	29.0	EMPC		
2,3,4,7,8-PeCDF	61.7			
1,2,3,4,7,8-HxCDF	~~398~~ 388			
1,2,3,6,7,8-HxCDF	105			
2,3,4,6,7,8-HxCDF	37.6			
1,2,3,7,8,9-HxCDF	82.6			
1,2,3,4,6,7,8-HpCDF	1790			
1,2,3,4,7,8,9-HpCDF	63.8			
OCDF	2860			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	98.7	25 - 164	D
	13C-1,2,3,7,8-PeCDD	107	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	95.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	90.7	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	94.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	102	23 - 140	
	13C-OCDD	79.4	17 - 157	D
	13C-2,3,7,8-TCDF	99.3	24 - 169	
	13C-1,2,3,7,8-PeCDF	102 ~~103~~ ~~102~~	24 - 185	
	13C-2,3,4,7,8-PeCDF	103 ~~102~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	86.2 ~~97.6~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	88.5	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	93.6	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	87.1 ~~96.9~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	98.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	106	26 - 138	
	13C-OCDF	92.0	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	119	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 1330

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Rose Harrelson 08-Mar-2012 14:24

Sample ID: SD-00-C01-006

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33546-003	Date Received:	14-Jan-12
Project:	FSI006	Sample Size:	10.0 g	QC Batch No.:	4226	Date Extracted:	25-Jan-12
Date Collected:	13-Jan-12	%Solids:	39.4	Date Analyzed DB-5:	28-Jan-12	Dates Analyzed SP-2331:	25-Feb-12
Time Collected:	1522						

5/18/12 JMD

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	692 J EMPC			
1,2,3,7,8-PeCDD	12.4			
1,2,3,4,7,8-HxCDD	10.4			
1,2,3,6,7,8-HxCDD	52.2 M			
1,2,3,7,8,9-HxCDD	28.4			
1,2,3,4,6,7,8-HpCDD	941			
OCDD	11100			D
2,3,7,8-TCDF	40.4			
1,2,3,7,8-PeCDF	28.1 EMPC			
2,3,4,7,8-PeCDF	58.3			
1,2,3,4,7,8-HxCDF	~~372~~ 370			
1,2,3,6,7,8-HxCDF	99.4 97.6			
2,3,4,6,7,8-HxCDF	34.1			
1,2,3,7,8,9-HxCDF	63.5			
1,2,3,4,6,7,8-HpCDF	1590			
1,2,3,4,7,8,9-HpCDF	54.1			
OCDF	2370			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	101	25 - 164	
	13C-1,2,3,7,8-PeCDD	108	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	97.3	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	86.7	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	93.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	101	23 - 140	
	13C-OCDD	78.4	17 - 157	D
	13C-2,3,7,8-TCDF	100	24 - 169	
	13C-1,2,3,7,8-PeCDF	102	24 - 185	
	13C-2,3,4,7,8-PeCDF	109 ~~104~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	102 ~~98.1~~	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	105 ~~88.6~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	110 ~~94.5~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	93.9 ~~97.1~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	98.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	107	26 - 138	
	13C-OCDF	95.5	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	112	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 823

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Rose Harrelson 08-Mar-2012 14:24

Sample ID: C01-SD1-012-018 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33546-004	Date Received:	14-Jan-12
Project:	FSI006	Sample Size:	10.1 g	QC Batch No.:	4226	Date Extracted:	25-Jan-12
Date Collected:	13-Jan-12	%Solids:	41.1	Date Analyzed DB-5:	28-Jan-12	Dates Analyzed SP-2331:	25-Feb-12
Time Collected:	0000						

5/18/12 AM

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	755		EMPC	
1,2,3,7,8-PeCDD	12.6			
1,2,3,4,7,8-HxCDD	10.1			
1,2,3,6,7,8-HxCDD	50.9		M	
1,2,3,7,8,9-HxCDD	27.3			
1,2,3,4,6,7,8-HpCDD	879			
OCDD	10900			D
2,3,7,8-TCDF	44.6			
1,2,3,7,8-PeCDF	26.8		EMPC	
2,3,4,7,8-PeCDF	54.7			
1,2,3,4,7,8-HxCDF	298			
1,2,3,6,7,8-HxCDF	~~85.3~~ 82.7			
2,3,4,6,7,8-HxCDF	33.4			
1,2,3,7,8,9-HxCDF	66.1			
1,2,3,4,6,7,8-HpCDF	1230			
1,2,3,4,7,8,9-HpCDF	46.2			
OCDF	1850			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	98.7	25 - 164	
	13C-1,2,3,7,8-PeCDD	105	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	91.6	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	83.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	87.3	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	95.3	23 - 140	
	13C-OCDD	71.5	17 - 157	D
	13C-2,3,7,8-TCDF	94.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	94.4	24 - 185	
	13C-2,3,4,7,8-PeCDF	95.8 ~~95.2~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	92.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	84 ~~83.3~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	82 ~~88.5~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	86 ~~92.6~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	93.5	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	97.4	26 - 138	
	13C-OCDF	90.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	106	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 872

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Rose Harrelson 08-Mar-2012 14:24

Sample ID: C01-SD1-018-024

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33546-007	Date Received:	14-Jan-12
Project:	FSI006	Sample Size:	10.1 g	QC Batch No.:	4226	Date Extracted:	25-Jan-12
Date Collected:	13-Jan-12	%Solids:	39.3	Date Analyzed DB-5:	28-Jan-12	Dates Analyzed SP-2331:	25-Feb-12
Time Collected:	1535						

5/18/12 dm

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	839		EMPC	
1,2,3,7,8-PeCDD	13.9			
1,2,3,4,7,8-HxCDD	11.0			
1,2,3,6,7,8-HxCDD	54.8		M	
1,2,3,7,8,9-HxCDD	30.4			
1,2,3,4,6,7,8-HpCDD	978			
OCDD	11600			D
2,3,7,8-TCDF	48.5			
1,2,3,7,8-PeCDF	29.2		EMPC	
2,3,4,7,8-PeCDF	61.8			
1,2,3,4,7,8-HxCDF	356			
1,2,3,6,7,8-HxCDF	~~98.1~~ 95.1			
2,3,4,6,7,8-HxCDF	34.7			
1,2,3,7,8,9-HxCDF	74.3			
1,2,3,4,6,7,8-HpCDF	1510			
1,2,3,4,7,8,9-HpCDF	53.5			
OCDF	2200			

	Labeled Standard		%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD		97.1	25 - 164	
	13C-1,2,3,7,8-PeCDD		88.4	25 - 181	
	13C-1,2,3,4,7,8-HxCDD		94.6	32 - 141	
	13C-1,2,3,6,7,8-HxCDD		85.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD		89.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD		94.5	23 - 140	
	13C-OCDD		76.0	17 - 157	D
	13C-2,3,7,8-TCDF		99.1	24 - 169	
	13C-1,2,3,7,8-PeCDF		96.7	24 - 185	
	13C-2,3,4,7,8-PeCDF	101	~~89.3~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF		95.2	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	85.3	~~86.6~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	82.2	~~91.4~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	86.3	~~94.4~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF		93.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF		99.8	26 - 138	
	13C-OCDF		88.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD		104	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 973

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Rose Harrelson 08-Mar-2012 14:24

Sample ID: C01-SD1-024-030 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Sediment	Lab Sample:	33546-008	Date Received:	14-Jan-12
Project:	FSI006	Sample Size:	10.0 g	QC Batch No.:	4226	Date Extracted:	25-Jan-12
Date Collected:	13-Jan-12 5/18/12	%Solids:	44.2	Date Analyzed DB-5:	28-Jan-12	Dates Analyzed SP-2331:	25-Feb-12
Time Collected:	1604						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	292 EMPC			
1,2,3,7,8-PeCDD	5.07			G
1,2,3,4,7,8-HxCDD	4.19			G
1,2,3,6,7,8-HxCDD	20.0			
1,2,3,7,8,9-HxCDD	10.3			
1,2,3,4,6,7,8-HpCDD	399 M			
OCDD	4940			
2,3,7,8-TCDF	17.8 EMPC			
1,2,3,7,8-PeCDF	9.97			
2,3,4,7,8-PeCDF	21.8			
1,2,3,4,7,8-HxCDF	113			
1,2,3,6,7,8-HxCDF	~~31.3~~ 29.4			
2,3,4,6,7,8-HxCDF	12.4			
1,2,3,7,8,9-HxCDF	~~5.39~~ 24.3			~~G~~
1,2,3,4,6,7,8-HpCDF	443			
1,2,3,4,7,8,9-HpCDF	18.8			
OCDF	793			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	103	25 - 164	
	13C-1,2,3,7,8-PeCDD	110	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	97.7	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	88.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	94.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	100	23 - 140	
	13C-OCDD	89.7	17 - 157	
	13C-2,3,7,8-TCDF	101	24 - 169	
	13C-1,2,3,7,8-PeCDF	102	24 - 185	
	13C-2,3,4,7,8-PeCDF	106 ~~103~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	99.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	87.8 ~~90.8~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	87.9 ~~95.3~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	88.4 ~~97.6~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	98.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	105	26 - 138	
	13C-OCDF	91.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	111	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 336

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: MAS

Approved By: Rose Harrelson 08-Mar-2012 14:24

Sample ID: C01-SD1-030-036 **EPA Method 1613**

Client Data
Name: Tierra Solutions, Inc.
Project: FSI006
Date Collected: 13-Jan-12
Time Collected: 1640
5/18/12 JH

Sample Data
Matrix: Sediment
Sample Size: 10.1 g
%Solids: 45.5

Laboratory Data
Lab Sample: 33546-010
QC Batch No.: 4226
Date Analyzed DB-5: 28-Jan-12
Date Received: 14-Jan-12
Date Extracted: 25-Jan-12
Dates Analyzed SP-2331: 25-Feb-12

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	674		EMPC	
1,2,3,7,8-PeCDD	6.89			
1,2,3,4,7,8-HxCDD	5.57			
1,2,3,6,7,8-HxCDD	28.3			
1,2,3,7,8,9-HxCDD	15.4			
1,2,3,4,6,7,8-HpCDD	473		M	
OCDD	5520			
2,3,7,8-TCDF	24.4		EMPC	
1,2,3,7,8-PeCDF	11.9			
2,3,4,7,8-PeCDF	28.6			
1,2,3,4,7,8-HxCDF	116			
1,2,3,6,7,8-HxCDF	~~35.2~~ 34.4			
2,3,4,6,7,8-HxCDF	14.6			
1,2,3,7,8,9-HxCDF	~~27.3~~ 6.63			
1,2,3,4,6,7,8-HpCDF	456			
1,2,3,4,7,8,9-HpCDF	22.5			
OCDF	809			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	95.3	25 - 164	
	13C-1,2,3,7,8-PeCDD	103	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.6	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	85.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	88.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	96.8	23 - 140	
	13C-OCDD	85.9	17 - 157	
	13C-2,3,7,8-TCDF	96.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	98.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	93.6 ~~99.5~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	93.7	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	83.7 ~~85.9~~	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	83.2 ~~90.2~~	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	91.8	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	93.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	99.2	26 - 138	
	13C-OCDF	89.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	104	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 728

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.
e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)
The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: MAS

Approved By: Rose Harrelson 08-Mar-2012 14:25

Sample ID: **RB-20120111** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.	Matrix:	Solvent	Lab Sample:	33546-006	Date Received:	14-Jan-12
Project:	FSI006	Sample Size:	0.100 L	QC Batch No.:	4262	Date Extracted:	5-Feb-12
Date Collected:	11-Jan-12			Date Analyzed DB-5:	7-Feb-12	Dates Analyzed SP-2331:	26-Feb-12
Time Collected:	1715						

5/18/12 dm

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	305000 J			D
1,2,3,7,8-PeCDD	1810			
1,2,3,4,7,8-HxCDD	928			
1,2,3,6,7,8-HxCDD	1920			
1,2,3,7,8,9-HxCDD	685			
1,2,3,4,6,7,8-HpCDD	5430			
OCDD	62900			
2,3,7,8-TCDF	~~1820~~ 1560 J			
1,2,3,7,8-PeCDF	5350 J			
2,3,4,7,8-PeCDF	29300			D
1,2,3,4,7,8-HxCDF	280000			D
1,2,3,6,7,8-HxCDF	37200 EMPC J			D
2,3,4,6,7,8-HxCDF	~~9530~~ 14400 J			D
1,2,3,7,8,9-HxCDF	21200			D
1,2,3,4,6,7,8-HpCDF	570000			D
1,2,3,4,7,8,9-HpCDF	24800			
OCDF	990000			D

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	101	25 - 164	D
	13C-1,2,3,7,8-PeCDD	115	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	96.6	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	82.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	92.1	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	94.2	23 - 140	
	13C-OCDD	87.2	17 - 157	
	13C-2,3,7,8-TCDF	96.9	24 - 169	
	13C-1,2,3,7,8-PeCDF	101	24 - 185	
	13C-2,3,4,7,8-PeCDF	85.3 ~~99.2~~	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	107	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	97.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	93.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	90.2 ~~98.4~~	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	104	28 - 143	D
	13C-1,2,3,4,7,8,9-HpCDF	104	26 - 138	
	13C-OCDF	85.2	17 - 157	D
CRS	37Cl-2,3,7,8-TCDD	154	35 - 197	D

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **357000**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: FEB

Approved By: Martha M. Maier 08-Mar-2012 14:29