



DATA VALIDATION REPORT

**SAN JACINTO RIVER WASTE PITS
RUSH DIOXIN/FURAN SAMPLING**

Prepared for:

Integral Consulting, Inc.
1205 West Bay Dr. NW
Olympia, Washington 98502

Prepared by:

EcoChem, Inc.
500 Union Street, Suite 1010
Seattle, Washington 98101

EcoChem Project: C22130-26

September 20, 2017

Approved for Release:

A handwritten signature in black ink that reads "Christina Mott Frans". The signature is written in a cursive style.

Christina Mott Frans
Senior Project Chemist
EcoChem, Inc.

PROJECT NARRATIVE

Basis for Data Validation

This report summarizes the results of summary validation (EPA Stage 2B) performed on sediment sample data for the San Jacinto Waste Pits Rush Sampling. A complete list of samples is provided in the **Sample Index**.

Samples were analyzed by ALS Environmental, Houston, Texas. The analytical methods and EcoChem project chemists are listed below.

ANALYSIS	METHOD	PRIMARY REVIEW	SECONDARY REVIEW
Dioxin/Furan Compounds	1613B	E. Clayton	C. Frans

The data were reviewed using guidance and quality control criteria documented in the analytical methods and the following project and guidance documents:

- *Sampling and Analysis Plan: Sediment Study San Jacinto River Waste Pits Superfund Site* (Integral/Anchor QEA, April 2010).
- Addendum 3 (to the Sediment Sampling and Analysis Plan) - *Additional Sediment Sampling within the USEPA's Preliminary Site Perimeter, San Jacinto River Waste Pits Superfund Site* (Integral/Anchor QEA, March 2016).
- *USEPA National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review* (USEPA 2011).

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions, reason codes, and validation criteria are included as **APPENDIX A**. A Qualified Data Summary Table is included in **APPENDIX B**. Data Validation Worksheets and project associated communications will be kept on file at EcoChem, Inc. A qualified laboratory electronic data deliverable (EDD) is also submitted with this report.

Sample Index
San Jacinto Waste Pits
2017 Rush Sampling

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans
E1700939	SJWP-090717-COMP015	E1700939-001	✓
	SJWP-090717-006W	E1700939-002	✓
	SJWP-090717-007W	E1700939-003	✓
E1700943	SJWP-091117-Comp 02	E1700943-001	✓
	SJWP-091117-Comp-C 006S	E1700943-002	✓

DATA VALIDATION REPORT
San Jacinto River Waste Pits
Rush Surface Water Sampling
Dioxin/Furan Compounds by Method 1613B

This report documents the review of analytical data from the analysis of treated surface water samples and the associated laboratory and field quality control (QC) samples. Samples were analyzed by ALS Environmental, Houston, Texas. See the **Sample Index** for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
E1700939	2 Surface Water	EPA Stage 2B

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

The electronic data deliverable (EDD) was verified against the laboratory portable document format (PDF) data package. No errors were found.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

✓	Sample Receipt, Preservation, and Holding Times	✓	Laboratory Control Samples
✓	System Performance and Resolution Checks	1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
✓	Initial Calibration	1	Laboratory Duplicates
✓	Calibration Verification	1	Field Duplicates
2	Method Blanks	✓	Reported Results
1	Field Blanks	2	Compound Identification
✓	Labeled Compounds		

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.

1 Quality control results are discussed below, but no data were qualified.

2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Method Blanks

In order to assess the impact of blank contamination on the reported sample results, action levels were established at five times the blank concentrations. If the concentrations in the associated field samples were less than the action levels, the results were qualified as not detected (U-7) at the reported concentrations.

The laboratory assigned an "EMPC" flag to an analyte result when a detected peak did not meet identification criteria. These values cannot be considered as positive identifications, but are "estimated maximum possible concentrations". When a result in the method blank had an "EMPC" flag, the result was treated as not detected at an elevated detection limit; therefore, no action level was established for these analytes. Blank qualifiers are not assigned to homolog groups.

Although several target analytes were detected in the method blanks, only the following results were qualified based on method blank contamination:

Analyte	Samples	Qualifier
1,2,3,4,6,7,8-HpCDD	SJWP-090717-006W	U-7
1,2,3,4,7,8-HxCDF	SJWP-090717-007W	U-7
1,2,3,7,8,9-HxCDF	SJWP-090717-007W	U-7
OCDF	SJWP-090717-006W, SJWP-090717-007W	U-7
Total Hepta-Dioxins	SJWP-090717-006W	U-7
Total Penta-Furans	SJWP-090717-006W	U-7
Total Hexa-Furans	SJWP-090717-006W	U-7

Field Blanks

No field blanks were submitted.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicates were not analyzed and are not required by the method. Laboratory precision and accuracy were evaluated using the labeled compound recoveries and the LCS/LCSD recovery and RPD values.

Laboratory Duplicate

Laboratory duplicates were not analyzed. Precision was evaluated from the LCS/LCSD and field duplicate RPD values.

Field Duplicates

No field duplicates were submitted.

Compound Identification

The laboratory assigned K-flags to results where a peak was detected but did not meet ion ratio quantitation criteria. The reported values cannot be considered as positive identifications for these analytes. These results were considered potential false positives or estimated maximum possible concentrations (EMPC) and were qualified as not detected (U-25) at the reported values.

The method requires the confirmation of 2,3,7,8-TCDF using an alternate GC column as the DB5 column that is typically used cannot fully separate 2,3,7,8-TCDF from closely eluting non-target TCDF isomers. The laboratory did not perform a second column confirmation; however, the laboratory uses a DB-5MSUI column. This column provides adequate resolution of the TCDF isomers as indicated by the acceptable peak to valley ratios. Since the 2,3,7,8-TCDF resolution was acceptable, no action was necessary.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by the labeled compound and LCS/LCSD recoveries and precision was acceptable as demonstrated by the LCS/LCSD RPD values.

Detection limits were elevated based on ion ratio outliers and method blank contamination.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto River Waste Pits
Rush Sediment Sampling
Dioxin/Furan Compounds by EPA 1613B

This report documents the review of analytical data from the analyses of sediment samples and the associated laboratory and field quality control (QC) samples. Samples were analyzed by ALS Environmental, Houston, Texas. Refer to the **Sample Index** for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
E1700939	1 Sediment	EPA Stage 2B
E1700943	2 Sediment	EPA Stage 2B

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the laboratory data package.

SDG 17E00943: See the section on Sample Receipt, Preservation, and Holding Times for details regarding a sample identification discrepancy.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Receipt, Preservation, and Holding Times	✓	Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
✓	System Performance and Resolution Checks	1	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)
✓	Initial Calibration (ICAL)	1	Field Replicate Samples
✓	Calibration Verification	✓	Target Analyte List
2	Laboratory Blanks	1	Reported Results
1	Field Blanks	2	Compound Identification
✓	Labeled Compound Recovery		

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.

1 Quality control results are discussed below, but no data were qualified.

2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

The validation guidance documents state that the cooler temperatures should be within an advisory temperature range of 2° to 6°C. With the following exception noted below, the laboratory received the sample coolers within the advisory temperature range.

SDG 17E00943: Sample SJWP-091117-006S as listed on the Chain-of-Custody (COC) was reported in the laboratory report as SJWP-091117-Comp 006S and in the electronic data deliverable (EDD) as SJWP-091117-C 006S. The client advised that the identification of the sample was changed by them in the EDD and that the identifications as reported should remain as is.

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level was established at five times (5x) the concentration reported in the blank. If a contaminant was reported in an associated field sample and the concentration was less than the action level, the result was qualified as not detected (U-7). No action was taken if the sample result was greater than the action level or for non-detected results. The laboratory assigned K-flags to values for detected peaks that did not meet identification criteria. These values cannot be considered as positive identifications, but are "estimated maximum possible concentrations". When these occurred in the method blank, the results were considered as false positives. No action levels were established for these analytes.

Method blanks were analyzed at the appropriate frequency. Various target analytes were detected in the method blanks, however only the result noted below required qualification:

SDG	Analyte	Sample	Qualifier
E1700939	1,2,3,7,8,9-HxCDF	SJWP-090717-COMP015	U-7

Field Blanks

No field blanks were submitted.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) samples are not required by the method and were not analyzed. Accuracy and precision were evaluated using the labeled compound and laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results.

Field Replicates

No field replicates were submitted.

Reported Results

Reporting limits were adjusted for percent solids and starting sample size.

Compound Identification

The laboratory assigned K-flags to results where a peak was detected but did not meet ion ratio quantitation criteria. The reported values cannot be considered as positive identifications for these analytes. These results were considered potential false positives or estimated maximum possible concentrations (EMPC) and were qualified as not detected (U-25) at the reported values.

The method requires the confirmation of 2,3,7,8-TCDF using an alternate GC column as the DB5 column that is typically used cannot fully separate 2,3,7,8-TCDF from closely eluting non-target TCDF isomers. The laboratory did not perform a second column confirmation; however, the laboratory uses a DB-5MSUI column. This column provides adequate resolution of the TCDF isomers as indicated by the acceptable peak to valley ratios. Since the 2,3,7,8-TCDF resolution was acceptable, no action was necessary.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable as demonstrated by labeled compound and LCS/LCSD %R values. Precision was acceptable as demonstrated by the LCS/LCSD RPD values.

Detection limits were elevated due to ion ratio outliers and method blank contamination.

All data, as qualified, are acceptable for use.



APPENDIX A

DATA QUALIFIER DEFINITIONS REASON CODES AND CRITERIA TABLES

DATA VALIDATION QUALIFIER CODES

Based on National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration.
UJ	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.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.
-----	---

DATA QUALIFIER REASON CODES

Group	Code	Reason for Qualification
Sample Handling	1	Improper Sample Handling or Sample Preservation (i.e., headspace, cooler temperature, pH, summa canister pressure); Exceeded Holding Times
Instrument Performance	24	Instrument Performance (i.e., tune, resolution, retention time window, endrin breakdown, lock-mass)
	5A	Initial Calibration (RF, %RSD, r^2)
	5B	Calibration Verification (CCV, CCAL; RF, %D, %R) Use bias flags (H,L) ¹ where appropriate
	5C	Initial Calibration Verification (ICV %D, %R) Use bias flags (H,L) ¹ where appropriate
Blank Contamination	6	Field Blank Contamination (Equipment Rinsate, Trip Blank, etc.)
	7	Lab Blank Contamination (i.e., method blank, instrument blank, etc.) Use low bias flag (L) ¹ for negative instrument blanks
Precision and Accuracy	8	Matrix Spike (MS and/or MSD) Recoveries Use bias flags (H,L) ¹ where appropriate
	9	Precision (all replicates: LCS/LCSD, MS/MSD, Lab Replicate, Field Replicate)
	10	Laboratory Control Sample Recoveries (a.k.a. Blank Spikes) Use bias flags (H,L) ¹ where appropriate
	12	Reference Material Use bias flags (H,L) ¹ where appropriate
	13	Surrogate Spike Recoveries (a.k.a. labeled compounds, recovery standards) Use bias flags (H,L) ¹ where appropriate
Interferences	16	ICP/ICP-MS Serial Dilution Percent Difference
	17	ICP/ICP-MS Interference Check Standard Recovery Use bias flags (H,L) ¹ where appropriate
	19	Internal Standard Performance (i.e., area, retention time, recovery)
	22	Elevated Detection Limit due to Interference (i.e., chemical and/or matrix)
	23	Bias from Matrix Interference (i.e. diphenyl ether, PCB/pesticides)
Identification and Quantitation	2	Chromatographic pattern in sample does not match pattern of calibration standard
	3	2 nd column confirmation (RPD or %D)
	4	Tentatively Identified Compound (TIC) (associated with NJ only)
	20	Calibration Range or Linear Range Exceeded
	25	Compound Identification (i.e., ion ratio, retention time, relative abundance, etc.)
Miscellaneous	11	A more appropriate result is reported (multiple reported analyses i.e., dilutions, re-extractions, etc. Associated with "R" and "DNR" only)
	14	Other (See DV report for details)
	26	Method QC information not provided

¹H = high bias indicated

L = low bias indicated

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Waters/Solids ≤ 6°C & in the dark Tissues < -10°C & in the dark Preservation Aqueous: If Cl ₂ is present Thiosulfate must be added and if pH > 9 it must be adjusted to 7 - 9	NFG ⁽¹⁾ Method ⁽²⁾	J(pos)/R(ND) if thiosulfate not added if Cl ₂ present; J(pos)/UJ(ND) if pH not adjusted J(pos)/UJ(ND) if temp > 20°C	1	EcoChem PJ, see TM-05
Holding Time	If properly stored, 1 year or: Extraction (all matrices): 30 days from collection Analysis (all matrices): 45 days from extraction	NFG ⁽¹⁾ Method ⁽²⁾	If not properly stored or HT exceedance: J(pos)/UJ(ND)	1	EcoChem PJ, see TM-05 Gross exceedance = > 1 year 2011 NFG Note: Under CWA, SDWA, and RCRA the HT for H ₂ O is 7 days.
Instrument Performance					
Mass Resolution (Tuning)	PFK (Perfluorokerosene) ≥10,000 resolving power at m/z 304.9824. Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) . Analyzed prior to ICAL and at the start and end of each 12 hr. shift.	NFG ⁽¹⁾ Method ⁽²⁾	R(pos/ND) all analytes in all samples associated with the tune	24	Notify PM
Windows Defining Mix	Peaks for first and last eluters must be within established retention time windows for each selector group (chlorination level)	NFG ⁽¹⁾ Method ⁽²⁾	If peaks are not completely within windows (clipped): If natives are ok, J(pos)/UJ(ND) homologs (Totals) If natives are affected, R all results for that selector group	24	Notify PM
Column Performance Mix	Both mixes must be analyzed before ICAL and CCAL Valley < 25% (valley = (x/y)*100%) where x = ht. of TCDD (or TCDF) & y = baseline to bottom of valley For all isomers eluting near the 2378-TCDD (TCDF) peak (TCDD only for 8290)	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) if valley > 25%	24	EcoChem PJ, see TM-05, Rev. 2; Note: TCDF is evaluated only if second column confirmation is performed
Initial Calibration Sensitivity	S/N ratio > 10 for all native and labeled compounds in CS1 std.	NFG ⁽¹⁾ Method ⁽²⁾	If <10, elevate Det. Limit or R(ND)	5A	
Initial Calibration Selectivity	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	NFG ⁽¹⁾ Method ⁽²⁾	If 2 or more ion ratios are out for one compound in ICAL, J(pos)	5A	EcoChem PJ, see TM-05, Rev. 2

**Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Performance (continued)					
Initial Calibration (Minimum 5 stds.) Stability	%RSD < 20% for native compounds %RSD < 30% for labeled compounds (%RSD < 35% for labeled compounds under 1613b)	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) natives if %RSD > 20%	5A	EcoChem PJ, see TM-05, Rev. 2
	Absolute RT of ¹³ C ₁₂ -1234-TCDD >25 min on DB5 & >15 min on DB-225	NFG ⁽¹⁾ Method ⁽²⁾	Narrate, no action		
Continuing Calibration (Prior to each 12 hr. shift) Sensitivity	S/N ratio for CS3 standard > 10	NFG ⁽¹⁾ Method ⁽²⁾	If <10, elevate Det. Limit or R(ND)	5B	
Continuing Calibration (Prior to each 12 hr. shift) Selectivity	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	NFG ⁽¹⁾ Method ⁽²⁾	For congener with ion ratio outlier, J(pos) natives in all samples associated with CCAL. No action for labeled congener ion ratio outliers.	25	EcoChem PJ, see TM-05
Continuing Calibration (Prior to each 12 hr. shift) Stability	%D +/-20% for native compounds %D +/-30% for labeled compounds (Must meet limits in Table 6, Method 1613B) If %D in the closing CCAL are within 25%/35%, the mean RF from the two CCAL may be used to calculate samples (Section 8.3.2.4 of 8290).	NFG ⁽¹⁾ Method ⁽²⁾	Labeled compounds: Narrate, no action. Native compounds: 1613: J(pos)/UJ(ND) if %D is outside Table 6 limits J(pos)/R(ND) if %D is +/-75% of Table 6 limits 8290: J(pos)/UJ(ND) if %D = 20% - 75% J(pos)/R(ND) if %D > 75%	5B (H,L) ³	
	Absolute RT of ¹³ C ₁₂ -1234-TCDD and ¹³ C ₁₂ -123789-HxCDD should be ± 15 seconds of ICAL RRT for all other compounds must meet criteria listed in Table 2 Method 1316.	NFG ⁽¹⁾ Method ⁽²⁾	Narrate, no action	5B	EcoChem PJ, see TM-05
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > RL	NFG ⁽¹⁾ Method ⁽²⁾	U(pos) if result is < 5X action level.	7	Hierarchy of blank review: #1 - Review MB, qualify as needed #2 - Review FB, qualify as needed
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL		U(pos) if result is < 5X action level.	6	

**Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	MS/MSD not typically required for HRMS analyses. If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) if both %R > UCL - high bias J(pos)/UJ(ND) if both %R < LCL - low bias J(pos)/R(ND) if both %R < 10% - very low bias J(pos)/UJ(ND) if one > UCL & one < LCL, with no bias PJ if only one %R outlier	8 (H,L) ³	No action if only one spike %R is outside criteria. No action if parent concentration is > 4x the amount spiked. Qualify parent sample only unless other QC indicates systematic problems.
MS/MSD (RPD)	MS/MSD not typically required for HRMS analyses. If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) in parent sample if RPD > CL	9	Qualify parent sample only.
LCS (or OPR)	One per lab batch (of ≤ 20 samples) Use most current laboratory control limits or Limits from Table 6 of 1613B	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	10 (H,L) ³	No action if only one spike %R is outside criteria, when LCSD is analyzed. Qualify all associated samples.
LCS/LCSD (RPD)	LCSD not typically required for HRMS analyses. One set per matrix and batch of 20 samples RPD < 35%	Method ⁽²⁾ EcoChem standard policy	J(pos) assoc. compound in all samples if RPD > CL	9	Qualify all associated samples.
Lab Duplicate (RPD)	Lab Dup not typically required for HRMS analyses. One per lab batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos)/UJ(ND) if RPD > CL	9	
Labeled Compounds (Internal Standards)	Added to all samples %R = 40% - 135% in all samples 8290 %R must meet limits in Table 7 Method 1613B	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	13 (H,L) ³	
Field Duplicates	Solids: RPD < 50% OR difference < 2X RL (for results < 5X RL) Aqueous: RPD < 35% OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Narrate and qualify if required by project	9	Use professional judgment

**Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound ID and Calculation					
Quantitation/ Identification	All ions for each isomer must maximize within ± 2 seconds. S/N ratio >2.5 Ion ratios must meet criteria listed in Table 8 Method 8290, or Table 9 of 1613B; RRTs w/in limits in Table 2 of 1613B	NFG ⁽¹⁾ Method ⁽²⁾	Narrate in report; qualify if necessary NJ(pos) for retention time outliers. U(pos) for ion ratio outliers.	25	EcoChem PJ, see TM-05
EMPC (estimated maximum possible concentration)	If quantitation identification criteria are not met, laboratory should report an EMPC value.	NFG ⁽¹⁾ Method ⁽²⁾	If laboratory correctly reported an EMPC value, qualify the native compound U(pos) to indicate that the value is a detection limit and qualify total homolog groups J (pos)	25	Use professional judgment See TM-18
Interferences	Interferences from chlorodiphenyl ether compounds	NFG ⁽¹⁾ Method ⁽²⁾	J(pos)/UJ(ND) if present	23	See TM-16
	Lock masses must not deviate $\pm 20\%$ from values in Table 8 of 1613B	Method ⁽²⁾	J(pos)/UJ(ND) if present	24	See TM-17
Second Column Confirmation	All 2,3,7,8-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC criteria must also be met for the confirmation analysis.	NFG ⁽¹⁾ Method ⁽²⁾	Report the DB-225 value. If not performed use PJ.	3	DNR-11 DB5 result if both results from both columns are reported. EcoChem PJ, see TM-05
Calculation Check	Check 10% of field & QC sample results	EcoChem standard policy	Contact laboratory for resolution and/or corrective action	na	Full data validation only.
Electronic Data Deliverable (EDD)					
Verification of EDD to hardcopy data	EcoChem verify @ 10% unless problems noted; then increase level up to 100% for next several packages.		Depending on scope of problem, correct at EcoChem (minor issues) to resubmittal by laboratory (major issues).	na	EcoChem Project Manager and/or Database Administrator will work with lab to provide long-term corrective action.
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	

(pos) - positive (detected) results; (ND) - not detected results

¹ National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) & Chlorinated Dibenzofurans (CDFs) Data Review, September 2011

² Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry (HRGC/HRMS), USEPA SW-846, Method 8290

² EPA Method 1613, Rev.B, Tetra-through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGS/HRMS, October 1994

³ NFG 2013 suggests using "+" / "-" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.



ECO-CHEM
Data Quality

APPENDIX B

QUALIFIED DATA SUMMARY TABLE

Qualified Data Summary Table
San Jacinto Waste Pits
Rush Dioxins Sampling

SDG	Sample ID	Lab Sample ID	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1700939	SJWP-090717-COMP015	E1700939-001	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0797	ng/kg	JK	U	25
	SJWP-090717-COMP015	E1700939-001	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.081	ng/kg	BJK	U	25
	SJWP-090717-COMP015	E1700939-001	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.178	ng/kg	BJK	U	25
	SJWP-090717-COMP015	E1700939-001	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.121	ng/kg	BJ	U	7
	SJWP-090717-COMP015	E1700939-001	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.151	ng/kg	JK	U	25
	SJWP-090717-COMP015	E1700939-001	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.206	ng/kg	JK	U	25
	SJWP-090717-006W	E1700939-002	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	7.93	pg/L	BJ	U	7
	SJWP-090717-006W	E1700939-002	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.184	pg/L	JK	U	25
	SJWP-090717-006W	E1700939-002	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.177	pg/L	BJK	U	25
	SJWP-090717-006W	E1700939-002	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.113	pg/L	BJK	U	25
	SJWP-090717-006W	E1700939-002	EPA1613B	Heptachlorodibenzo-p-dioxin (Total)	7.93	pg/L	J	U	7
	SJWP-090717-006W	E1700939-002	EPA1613B	Hexachlorodibenzofuran (Total)	1.04	pg/L	J	U	7
	SJWP-090717-006W	E1700939-002	EPA1613B	Octachlorodibenzofuran	3.82	pg/L	BJ	U	7
	SJWP-090717-006W	E1700939-002	EPA1613B	Pentachlorodibenzofuran (Total)	0.336	pg/L	J	U	7
	SJWP-090717-007W	E1700939-003	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.352	pg/L	BJK	U	25
	SJWP-090717-007W	E1700939-003	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.178	pg/L	BJK	U	25
	SJWP-090717-007W	E1700939-003	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	1.91	pg/L	BJ	U	7
	SJWP-090717-007W	E1700939-003	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.645	pg/L	JK	U	25
	SJWP-090717-007W	E1700939-003	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.417	pg/L	BJ	U	7
	SJWP-090717-007W	E1700939-003	EPA1613B	Octachlorodibenzofuran	11.6	pg/L	BJ	U	7
E1700943	SJWP-091117- Comp 02	E1700943-001	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.29	ng/kg	JK	U	25
	SJWP-091117- Comp 02	E1700943-001	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.336	ng/kg	JK	U	25
	SJWP-091117- Comp 02	E1700943-001	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.957	ng/kg	JK	U	25
	SJWP-091117- Comp 02	E1700943-001	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.127	ng/kg	BJK	U	25
	SJWP-091117- Comp 02	E1700943-001	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.176	ng/kg	JK	U	25
	SJWP-091117- Comp 02	E1700943-001	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.265	ng/kg	JK	U	25
	SJWP-091117- Comp 02	E1700943-001	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.2	ng/kg	BJK	U	25
	SJWP-091117- Comp 02	E1700943-001	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.55	ng/kg	K	U	25
	SJWP-091117- C 006S	E1700943-002	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.613	ng/kg	JK	U	25
	SJWP-091117- C 006S	E1700943-002	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.502	ng/kg	JK	U	25
	SJWP-091117- C 006S	E1700943-002	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.788	ng/kg	JK	U	25
	SJWP-091117- C 006S	E1700943-002	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	1.11	ng/kg	JK	U	25