
US EPA Approval Signature

Date

August 2, 2002

B-02-08-Y-5

Revised: August 20, 2002

Ms. Christine Clark
Regional Sample Control Custodian
Office of Environmental Measurement and Evaluation
U.S. EPA Region I
11 Technology Drive
North Chelmsford, MA 01863

Re: TO No. 09, Task No. 2, TDF No. 0523
Case No. Lower Connecticut River Fish Study
AXYS Analytical Services LTD - Sidney, BC, Canada
Lower Connecticut River

Dioxin/Furan: 12/Fish Tissue/CT1-SMB-FC02, CT1-WS-FC01, CT1-YP-FC05, CT4-SMB-FC04, CT4-WS-FC03, CT4-YP-FC03, CT5-SMB-FC01, CT5-WS-FC05, CT5-YP-FC03, CT7-SMB-FC02, CT7-WS-FC03, CT7-YP-FC04

Dear Ms. Clark:

A modified Tier II data validation was performed on the Dioxin/Furan analytical data for 12 fish tissue samples collected from the Connecticut River by the following state agencies: CTDEP, MADEP, NHDES with USFWS, and VTDEC for NEIWPC and the U.S. EPA. The samples were prepared by the U.S. EPA's New England Regional Laboratory and sent to the Environmental Research Institute of the University of Connecticut in Storrs, CT. ERI contracted AXYS for the analytical work. The samples were analyzed according to EPA Method 8290A Rev. 1, January 1998 and criteria in the Connecticut River Fish Tissue Study Quality Assurance Project Plan (QAPP), April 6, 2000 by AXYS Analytical Services LTD. The samples were validated using first the criteria in Connecticut River QAPP referenced above as well as additional criteria in EPA Method 8290A Rev. 1, January 1998, defaulting next to Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, December 1996 criteria, and to EPA Region I's Environmental Services Assistance Team Dioxin Data Validation SOP ESAT-01-0007 (01/31/01). The data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness (CSF Audit - Tier I)
- * ● Preservation and Technical Holding Times
- NR ● PE Samples/Accuracy Check
- * ● Window Defining Mix
- * ● Initial and Continuing Calibrations
- * ● Chromatographic Resolution
- * ● Instrument Sensitivity Check

- Blanks
- * ● Matrix Spike/Matrix Spike Duplicate
- NR ● Laboratory and Field Duplicates
- * ● Internal/Clean-up Standards
- * ● Sample Analysis and Identification
- Sample Quantitation
- * ● Estimated Detection Limits (EDL) and Estimated Maximum Possible Concentration (EMPC)
- 2378-TCDD Toxicity Equivalents (TE) and Isomer Specificity
- * ● Required Sample Reruns and Second Column Confirmation
- System Performance

* - All criteria were met for this parameter.

NR - Not Reported by the Laboratory

NA - Not analyzed by the laboratory

The following information was used to generate the Data Validation Memorandum attachments:

Table I: Recommendation Summary Table - summarizes validation recommendations

Table II: Overall Evaluation of Data - summarizes site objectives and potential usability issues

Data Summary Tables - summarize accepted, qualified, and rejected data

Overall Evaluation of Data and Potential Usability Issues

The following is a summary of the site investigation/assessment objectives:

- To perform a watershed-wide fish tissue monitoring program which will document current conditions with regard to contaminant concentrations of representative fish species from the mainstem of the Connecticut River. This information will enable states to revise human health risk assessments and will provide a basis for trend analysis when subsequent sampling is performed by monitoring teams.

The laboratory stated that the SRM data was lost due to computer disk failure. However, the laboratory did analyze a water and a soil Pre-award DLM01.3 PE sample for Dioxin and Furan Analysis by EPA Method 1613B in the same time frame as the fish tissue analysis. The laboratory scored 100% for the two PE samples, demonstrating good accuracy.

The laboratory did not analyze a duplicate sample from this batch of field samples. The laboratory was contacted and asked to provide the duplicate analyzed in the overall batch. The duplicate sample analyzed had acceptable precision. The laboratory demonstrated good duplicate precision. The results can be found in Attachment A.

The initial and continuing calibrations were run at the proper intervals and met method criteria.

The method and instrument blanks had low level contamination. This contamination problem

does not have an impact on the usability of the data. Contaminants were found in both the blank and the field samples. When the analyte concentrations in the field samples were less than the corresponding blank action level, the field sample results reported by the laboratory are qualified as non-detected (U) on the Data Summary Table. See Table I for a summary of the qualifiers applied due to blank contamination.

Data validation indicated minor data quality problems which do not significantly impact the usability of the data. See the discussion below for details. The reported results are usable for the site objectives.

Data Completeness (CSF Audit - Tier I)

The following data or information in the data package had discrepancies and/or were missing:

1. AXYS was asked to submit the sample log-in, extraction, and run logs for this project.
2. The sample receipt dates on the Form Is do not match the C-O-Cs. AXYS was asked to reconcile this discrepancy and submit corrected forms.
3. ERI was asked to provide the date received on the C-O-Cs for sampling dates 8/23/00, 9/11/00, 10/23/00, and 11/1/00.
4. AXYS was asked to submit the duplicate analysis if a sample was analyzed in duplicate.
5. ERI was asked to submit % solids and % lipid determinations.

Items 1 thru 5 were requested via the TOPO on July 10, 2002. Items 1 and 2 were received via the TOPO on July 23, 2002. Items 1 and 2 were adequately addressed.

For item 3, Environmental Research Institute stated that the data gap is documented and no further would be taken.

For item 4, AXYS did send duplicate sample data on July 29, 2002. The laboratory did not analyze a duplicate sample from this batch of field samples. The laboratory was contacted and asked to provide the duplicate analyzed in the overall batch. The duplicate sample analyzed had acceptable precision. The laboratory demonstrated good duplicate precision. The results can be found in Attachment A.

For item 5, AXYS did not perform % solid or % lipid determinations. The % lipids were reported from ERI's (primary laboratory) percent lipid determinations.

Blanks

All of the blanks associated with this SDG were evaluated for possible sources of contamination. The following table summarizes the highest concentration of contamination that was detected in the blanks. The table lists the action levels and the samples affected:

| Congener | Type of Blank | Blank Concentration ng/Kg | Action Level ng/Kg | Samples Affected |
|--------------|--------------------------------|------------------------------|-----------------------|---|
| OCDD | Instrument Blank (04/03/01) | 0.26 | 2.6 | CT1-WS-FC01, CT1-YP-FC05, CT4-SMB-FC04, CT4-WS-FC03, CT4-YP-FC03, CT5-SMB-FC01, CT5-WS-FC05, CT5-YP-FC03, CT7-SMB-FC02, CT7-WS-FC03, CT7-YP-FC04 |
| 123478-HxCDF | Instrument Blank (04/03/01) | 0.12 | 0.60 | CT4-WS-FC03, CT5-SMB-FC01, CT5-WS-FC05 |
| OCDF | Instrument Blank (04/03/01) | 0.16 | 1.6 | CT4-WS-FC03 |
| Total HxCDF | Instrument Blank (04/03/01) | 0.12 | 1.2 | CT1-WS-FC01, CT4-WS-FC03, CT5-SMB-FC01, CT5-WS-FC05, CT7-WS-FC03 |

Blank actions are based on Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, December 1996 and EPA Region I's Environmental Services Assistance Team Dioxin Data Validation SOP ESAT-01-0007 (01/31/01) criteria. Blank action levels are calculated as ten times the highest concentration of the contaminant determined in any blank for common contaminants (OCDD/OCDF and Total Homologues) and five times the highest concentration for all other analytes. The positive sample results that are less than the blank action level are reported as non-detects (U) at the reported concentration on the Data Summary Table.

Sample Quantitation

Concentrations quantitated below the lowest calibration standard are flagged (J) on the Data Summary Tables. Quantitation is not accurate when the reported results are below the lowest calibration standard.

2378-TCDD Toxicity Equivalents (TE) and Isomer Specificity

All TE values reported on the Data Summary Tables have been calculated by the ESAT data validator using the validated data discussed above in this report. As a result, the TE values in the Data Summary Table differ slightly from the values reported by the laboratory. The validated data accounts for blank contamination. The TE calculations include the reported EMPC values. The Fish TEF values used by ESAT are the ones published in Environmental Health Perspectives, volume 106, Number 12, December 1998, "Toxic Equivalency factors (TEFs) for

PCBs, PCDDs, PCDFs for Humans and Wildlife.”

System Performance

No trends noted.

Very truly yours,

LOCKHEED ENVIRONMENTAL

Janine Bartels
Principal Scientist

Louis Macri
ESAT Program Manager

cc: Anna Krasko, EPA Project (DV Memorandum, Data Summary Table)

Attachments: Table I: Recommendation Summary Table
Table II: Overall Evaluation of Data
Data Summary Tables
Data Validation Worksheets
Analytical Method
Communication/Phone Logs
DQO Summary Form

Table I
 Recommendation Summary Table for Dioxins/Furans
 Lower Connecticut River Fish Study

| Sample Nos. | CT1-SMB-FC02 | CT1-WS-FC01 | CT1-YP-FC05 | CT4-SMB-FC04 | CT4-WS-FC03 | CT4-YP-FC03 | CT5-SMB-FC01 |
|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Compound | | | | | | | |
| 2378-TCDD | A | A | A | A | A | A | A |
| 12378-PeCDD | A | A | A | A | A | A | A |
| 123478-HxCDD | A | A | A | A | A | A | A |
| 123678-HxCDD | A | A | A | A | A | A | A |
| 123789-HxCDD | A | A | A | A | A | A | A |
| 1234678-HpCDD | A | A | A | A | A | A | A |
| OCDD | J ¹ |
| 2378-TCDF | A | A | A | A | A | A | A |
| 12378-PeCDF | A | A | A | A | A | A | A |
| 23478-PeCDF | A | A | A | A | A | A | A |
| 123478-HxCDF | A | A | A | A | J ¹ | A | J ¹ |
| 123678-HxCDF | A | A | A | A | A | A | A |
| 123789-HxCDF | A | A | A | A | A | A | A |
| 234678-HxCDF | A | A | A | A | A | A | A |
| 1234678-HpCDF | A | A | A | A | A | A | A |
| 1234789-HpCDF | A | A | A | A | A | A | A |
| OCDF | A | A | A | A | J ¹ | A | A |

Table I
 Recommendation Summary Table for Dioxins/Furans
 Lower Connecticut River Fish Study

| Sample Nos. | CT5-WS-FC05 | CT5-YP-FC03 | CT7-SMB-FC02 | CT7-WS-FC03 | CT7-YP-FC04 |
|---------------|----------------|----------------|----------------|----------------|----------------|
| Compound | | | | | |
| 2378-TCDD | A | A | A | A | A |
| 12378-PeCDD | A | A | A | A | A |
| 123478-HxCDD | A | A | A | A | A |
| 123678-HxCDD | A | A | A | A | A |
| 123789-HxCDD | A | A | A | A | A |
| 1234678-HpCDD | A | A | A | A | A |
| OCDD | J ¹ |
| 2378-TCDF | A | A | A | A | A |
| 12378-PeCDF | A | A | A | A | A |
| 23478-PeCDF | A | A | A | A | A |
| 123478-HxCDF | J ¹ | A | A | A | A |
| 123678-HxCDF | A | A | A | A | A |
| 123789-HxCDF | A | A | A | A | A |
| 234678-HxCDF | A | A | A | A | A |
| 1234678-HpCDF | A | A | A | A | A |
| 1234789-HpCDF | A | A | A | A | A |
| OCDF | A | A | A | A | A |

Table I
Recommendation Summary Table for Dioxins/Furans

- A - Accept results.
- J¹ - Method blank contamination; positive sample results less than the blank action level are reported as non-detects (U) at the concentration reported.

EPA-NE - Data Validation Worksheet

Overall Evaluation of Data - Data Validation Memorandum - Table II

| DIOXIN/FURAN ANALYSIS | | | | | |
|--|--|---|--|-------------------------|---|
| DQO (list all DQOs) | Sampling and/or Analytical Method Appropriate Yes or No | Measurement Error | | Sampling Variability | Potential Usability Issues |
| | | Analytical Error | Sampling Error* | | |
| <p>To perform a watershed-wide fish tissue monitoring program which will document current conditions with regard to contaminant concentrations of representative fish species from the mainstem of the Connecticut River. This information will enable states to revise human health risk assessments and will provide a basis for trend analysis when subsequent sampling is performed by monitoring teams.</p> | <p>Yes, Sampling Method appropriate for all samples</p> <p>Yes, Analytical Method appropriate for all samples.</p> | <p>Refer to qualification in R/S Key on Table I:</p> <p>J¹</p> | <p>Refer to qualification in R/S Key on Table I:</p> <p>NA</p> | <p>**</p> | <p>The laboratory stated that the SRM data was lost due to computer disk failure and the laboratory. However, the laboratory did analyze a water and a soil Pre-award DLM01.3 PE sample for Dioxin and Furan Analysis by EPA Method 1613B in the same time frame as the fish tissue analysis. The laboratory scored 100% for the two PE samples, demonstrating good accuracy.</p> <p>The laboratory did not analyze a duplicate sample from this batch of field samples. The laboratory was contacted and asked to provide the duplicate analyzed in the overall batch. The duplicate sample analyzed had acceptable precision. The laboratory demonstrated good duplicate precision. The results can be found in Attachment A.</p> <p>The initial and continuing calibrations were run at the proper intervals and met method criteria.</p> <p>The method and instrument blanks had low level contamination. This contamination problem does not have an impact on the usability of the data. Contaminants were found in both the blank and the field samples. When the analyte concentrations in the field samples were less than the corresponding blank action level, the field sample results reported by the laboratory are qualified as non-detected (U) on the Data Summary Table. See Table I for a summary of the qualifiers applied due to blank contamination.</p> <p>Data validation indicated minor data quality problems which do not significantly impact the usability of the data. See the discussion below for details. The reported results are usable for the site objectives.</p> |

* The evaluation of "sampling error" cannot be completely assessed in the data validation.

** Sampling variability is not assessed in data validation.

Validator: _____

Date: _____